EXPLORING PRISONERS' USE OF PERSONAL COMPUTERS

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Copyright Statement

Abstract

Computer use is now an integral part of many aspects of working and community living. Prisons are more recent adopters of computers, following initial caution relating to security and cost. A small but growing number of prisons across the world now provide personal computer access to prisoners, understanding is needed of the effect that this has on prisons and prisoners. This thesis aims to explore whether personal computers in prisons are achieving their objective of supporting prisoners' rehabilitation, to inform future policy on prison design and investment in prison technology.

The literature base for personal computer use within prisons is limited, but use of technological innovations more broadly has been explored and thus may offer initial insights. The thesis therefore begins with a systematic review of a broader field, technology use within custodial settings, to explore findings that might be applied to personal computer use. The review identified 13 papers exploring technology use within prisons, and identified five findings that could be used to develop policy. Technology in prisons was related to prisoners' wellbeing, supportive of managing time, changes in attitudes, and increased connection with others. Failures in technology could lead to frustration.

Empirical investigation of personal computers in prisons, using an explanatory sequential mixed methods design followed. An initial quantitative study, uniquely gathered using survey data collected via in-cell computers, gathered from 784 prisoners at two prisons in England and Wales, was conducted. Significant relationships were observed between frequency of computer use, and agency for desistance, and wellbeing. The mechanism by which this process occurred was partially explained by six mediating variables. A second study sought to give voice to prisoners living with personal computers, and to explore the experiential and emotional aspects of how a computer adjusts the prison cell environment. Data targeting this phenomenon was collected through interviews with 12 prisoners and was analysed using reflexive thematic analysis. Five themes and 11 sub-themes were identified. Prisoners living with a

personal computer experienced them as rehabilitative, to assist with managing time, and to maintain relationships.

This research provides first evidence of personal computers achieving their objective of supporting prisoner rehabilitation.

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Special thanks to my mother, Janice Wilson, for passing on relentless optimism, which was handy over the last four years. I would also like to thank my husband Matt for a supportive home from which to take bold steps. Perhaps our early contact over the internal email inspired my interest in my research topic. I would further like to acknowledge the invaluable role that mobile broadband played in this thesis, enabling chapters to grow out of swimming pool spectator areas, athletics track carparks, and epee fencing seating spaces. Thanks too, to the special people who were the reason for needing the mobile broadband, my daughter Hannah, and my sons Arthur and Nate. I know you are amused by the topic of my research, given my difficulty in operating the TV remote control, I hope to master this now I have a little more time. While I will be proud to become a Dr, I already have the name I am most proud of, Mum.

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Chapter 1 - Thesis Introduction

Technology has changed the way humans live throughout history. Over the last 30 years, access to the internet specifically, has enabled people to use a computer to shop for groceries, meet partners, book holidays, and seek health support. Prisoners within custody in HM Prison and Probation Service (HMPPS) typically spend a significant part of their days within a cell, with limited options for productive rehabilitative activity during this period. Technology provides the potential to increase the activities that people in prison can engage in while locked in their cell, increasing rehabilitative opportunities. This thesis aims to explore how prisoners experience the introduction of technology to prison and further whether technological innovations within prisons have a rehabilitative effect.

Context of Technology Use and the Digital Divide

The pace of change of technology use across the modern world is remarkable. In 2021, adults in the United Kingdom spent an average of four hours each day online (Ofcom, 2022), a dramatic change since the introduction of the World Wide Web in 1987. Through this activity, people can communicate, find information, organize social activity, manage finances, shop, in fact there are few activities which the internet has not affected in some way. While uptake of technology grows there are however a minority of people who do not or cannot access technology for their day-to-day needs. As more services become available through online means only, this creates a problem, leaving some sections of society without equal access to goods and services. The disparity between those with full access to technology and those without is referred to as the digital divide (Local Government Association, 2021). Given the opportunities for knowledge and services available online, and the move away from offline services, the digital divide increases inequality between those with and without access to technology. Those that fall into the side of the divide without full access often include older adults, people from lower socioeconomic groups, and people with disabilities (Local Government Association, 2021). A further

group, less frequently commented upon, are people held in prison for whom the lack of access to technology creates an environment becoming increasingly remote from the experience outside of prison (Champion & Edgar, 2013). Reisdorf and Rikard (2018) propose a model of digital rehabilitation, emphasizing the importance of considering digital or online skills, alongside widely accepted offline skills, that may assist people transitioning from prison to the community. The model identifies potential fields that may contribute to a digital divide, economic, social, personal, cultural, and health and recommends training or access to technology within prisons that may assist in reducing this divide.

The literature indicates that for people in prison, the issues contributing to their digital exclusion are three-fold. Firstly, people in prison are more likely to have experienced social exclusion and reduced access to education prior to their prison sentence (Coates, 2016; Williams et al., 2012). They are therefore more likely to arrive in prison with lower digital literacy. Secondly, the lack of access to technology during their prison sentence prevents people in prison from keeping pace with the technological advancements taking place outside prison (Champion & Edgar, 2013; Reisdorf & Rikard, 2018). Thirdly, studies have found that access to technology within prison can reduce reoffending, improve relationships with friends and family, build agency and improve wellbeing (Barkworth et al., 2022; McDougall et al., 2017; Palmer et al., 2020; Thaler et al. 2022); the lack of access to technology therefore could be a barrier to rehabilitation. This thesis presents research which particularly focuses on this third issue, to explore how technology use in prison relates to a rehabilitative environment.

Technology in Prisons

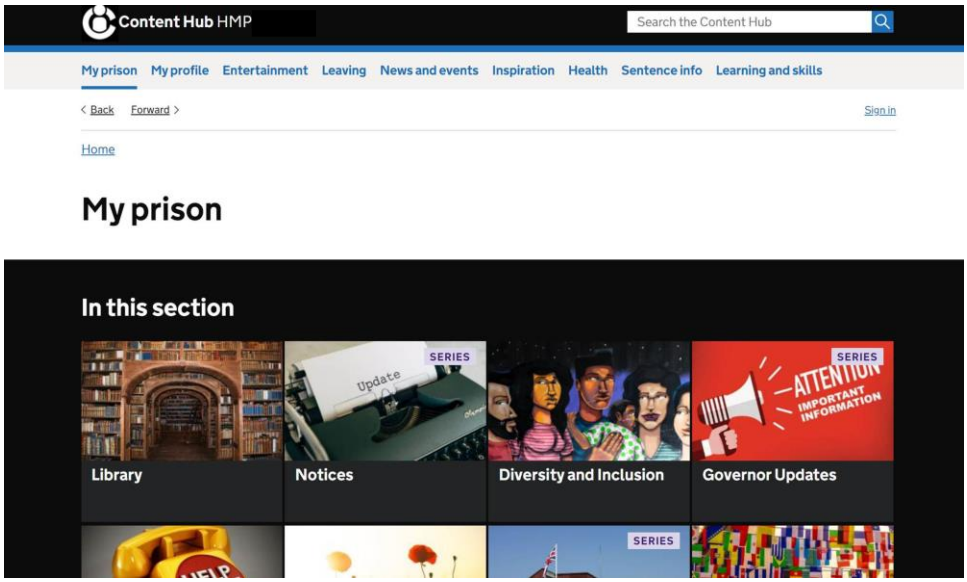
The HM Prison Service statement of purpose includes the dual functions of security and rehabilitation, "we keep those sentenced to prison in custody, helping them lead law-abiding and useful lives, both while they are in prison and after they are released" (HM Prison Service, 2023). The rationales for introducing technology to a prison environment have broadly served these two prison

functions of security and rehabilitation. Closed circuit television and later body worn cameras for example, were installed chiefly for the purpose of improving safety and security within the prison environment (Lawrence et al., 2022; Pope et al., 2020). An alternative category of technologies has been introduced to custodial environments for the purpose of improving rehabilitation, supporting prisoners while in custody, and preparing them for release. An early example of this category was seen in 1987 when a ground-breaking decision was taken to introduce telephones to prison wings. People in prison now had an alternative to letter writing and occasional visits, to allow them to maintain contact with friends and family. Extending access to phones across the prison estate was a recommendation of Lord Justice Woolf's report (Home Office, 1991), which followed the riot at HMP Strangeways in which one person died and 194 people were injured. The report made recommendations intended to improve decency for prisoners, one of which was that telephones should be installed across the prison estate, to allow people in prison to maintain relationships with those outside prison. Today, at some prisons within HMPPS, to improve prison conditions further, telephones are not only available on the prison wings but have been installed within prison cells. A further significant technological change to the prison environment occurred in 1995, when televisions were installed in prison cells. Prior to this, television watching had been a communal activity within a shared wing space. A pioneering ethnographic study by Knight (2012), explored prisoners' use of television and found it to normalise the prison cell environment. This research also found that televisions in cells assisted prisoners to manage their emotions, contributed to a more comforting prison environment and enabled people in prison to connect with life outside prison. Some years after the installation of televisions, a further screen was introduced into prisons, that of the computer. The first devices introduced, were shared machines, known as kiosks, based in a communal area of a prison residential unit. In contrast to the entertainment function of televisions, kiosks enabled people in prison to complete transactional tasks, such as ordering meals, topping up the credit on their phone account and making purchases (McDougall et al., 2017). This

shift in control over aspects of prison life seemed to provide prisoners with feelings of agency (Palmer et al., 2020). In 2016, technology in prisons made another leap forward, with the change from computers on wings to computers in prison cells. Personal computers were issued to all prisoners, at two HMPPS prisons, to be stored and used within the prison cells, a shift which altered the dynamic between prisoner and machine, given the 24 hour-a-day access. Personal computers have the potential to extend the rehabilitative outcomes identified for television (Knight, 2012) and kiosks (McDougall et al., 2017) by combining entertainment, transactional functions, and communication tools, within the privacy of a prison cell. Prisoners are provided with tools to manage their lives, such as maintaining personal relationships through email, managing their wellbeing through games and entertainment, and taking control of their finances. The allocated personal computers are not enabled to connect to the internet but are connected to an internal server. Information is shared via the computers, such as changes to the prison regimes, broadcasts from prison managers, and details of prison events. Messaging can take place between prisoners and prison staff (but not between prisoner and prisoner), and emails can be sent to friends and family outside prison. As with the kiosks, transactional tasks can also be completed via the computers. Figure 1.1 shows an image of a screenshot from the devices, illustrating the interface experienced by the prisoners, and the navigation bar that can be used to reach the functions of the computers (HMPPS, personal communication, April 2023).

Figure 1.1

Screenshot from Personal Computers Used in HMPPS Showing the Navigation Bar

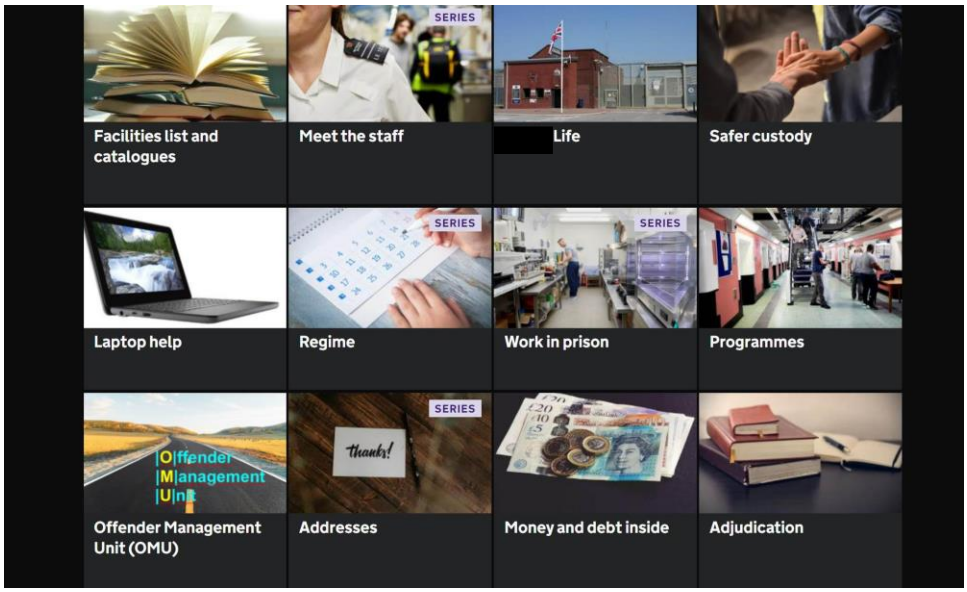


Note: Permission to print screenshot provided by HMPPS

Figure 1.2 shows a further screenshot from the personal computers showing examples of the type of content available for prisoners (HMPPS, personal communication, April 2023). While the interface is standardised across prison sites, the individual content is localised to each prison and therefore varies across sites and over time.

Figure 1.2

Screenshot from Personal Computers Showing Examples of Content Available



Note: Permission to print screenshot provided by HMPPS

Over the last 30 years, an increasing number of technologies have been introduced to prisons for the purpose of improving the rehabilitative environment. This thesis will explore the effectiveness of the most recent technology, that of personal computers in prison cells, in achieving this objective.

Technology and Rehabilitation

Several studies have explored the rehabilitative potential of technology within prisons, contributing to policy decisions to invest in further roll out. Kiosks, tablets, and in-cell telephones have been linked with feelings of increased agency and wellbeing (Palmer et al., 2020), increased autonomy and wellbeing (Barkworth et al., 2022) and decreased reoffending (McDougall et al., 2017). To date there is little research relating to a specific technology, personal computers for prisoners, which has been growing in recent years. The research presented in this thesis closes this research gap by exploring how personal computers affect prisoners' experience of prison. The findings will contribute to guidance

for policy makers tasked with designing prison environments. The proposed research sought to explore the psychological and experiential processes through which such rehabilitative outcomes may take place, that is the process by which technology relates to rehabilitation. The thesis will seek to address the following aims:

1. To explore the prisoner experience of living with a computer in their prison cell.
2. To explore the processes through which the use of technology in prison relates to rehabilitation.
3. To inform policy concerning technology in prisons which has a rehabilitative purpose.

Position Statement

While conducting the research presented in this thesis, the author was concurrently working as a psychologist within HMPPS and has over 20 years' experience working in this field. Through this work she brings to the research a history of an interest in developing environments which provide opportunities for pro-social change. This dual position of researcher and practitioner influenced the methods of designing, conducting and interpreting the studies, and where bias may have contributed to the findings, this is discussed in the relevant chapters.

The overarching philosophical position taken across the research is one of critical realism (Maxwell, 2012). This approach recognizes the existence of a real world and an observable world. Through research, events which the mechanisms of this real but unobservable world produce can be explored through the observable world, to provide insight into the real world. That is, critical realism accepts that empirical research studies the observable aspects of reality and the results of the studies are discussed through this philosophical lens.

Thesis Structure and Overview

The thesis consists of six chapters. Chapter 1 introduces the topic, provides context for the thesis and rationale for the empirical studies. The structure of the thesis is also described. Chapter 2 reports a systematic review of technological innovations in prison, which aim to contribute to a rehabilitative environment. This review provides the first structured synthesis of the available international literature on this topic. It provides a knowledge base for policy makers, prison designers and forensic psychologists, consulting on the potential outcomes of introducing technological innovations. It provides the context of the knowledge base relating to technology and rehabilitation on which the subsequent empirical studies are based. Chapters 3 and 4 report an explanatory sequential mixed method approach to examine how a specific technology, personal computers for prisoners, relates to rehabilitation in two prisons in England and Wales. Placing personal computers in prison cells is a recent innovation, not only for England and Wales, but worldwide, this research explores this pioneering innovation. Chapter 3 reports the first element of the mixed method approach; a quantitative study. This aimed to examine whether the personal computers are meeting the intended objectives for which they were introduced, of supporting relationships and providing a rehabilitative environment. The study achieves this by exploring the relationship between the frequency of use of the personal computers and two outcome variables, wellbeing, and agency for desistance. The mechanisms through which any relationships operate are explored by examining the role of mediating variables, providing a unique opportunity to understand the process of how computer use may predict rehabilitation and desistance. Chapter 4 reports the second element of the mixed methods approach, this involved a qualitative study exploring the experience for people in prison of living with the personal computers. This study provides an opportunity to develop the quantitative findings from the previous study, to interpret the findings through analysis of the experiences and accounts of people living with the computers. The study provides an opportunity to hear the narratives of those using the computers

and is the first academic analysis of the experiences of using personal computers within HMPPS. The integration of quantitative and qualitative data within the research design allows relationships identified in the quantitative data to be explored and more richly understood through the experiences of prisoners using the machines. Chapter 5 brings together the findings from the three preceding chapters, addresses the overall aims of the thesis and draws conclusions from the findings. The body of research presented in this thesis provides essential guidance for policy makers, the implications for whom are laid out in Chapter 5 as well as suggestions for proposed future research. Throughout the period of study, the researcher maintained a reflective document, to inform the decisions taken, guide the research direction, and to provide a transparent record of the researcher's positionality. Chapter 6 provides a summary of the researcher's reflective observations made over the course of preparing for and carrying out the research studies.

Chapter 2

Study 1 - How Does the Installation of Technology in Prisons Affect Prisoners? A Systematic Review

Technological innovation within prisons has tended to lag behind that in the community. In part this may be attributed to limited resources, security concerns, and public perception. In relation to the latter reason for example, a survey of 237 members of the public found that the majority of participants considered prisoner access to technology to be a luxury (Hadlington & Knight, 2022). As a result of barriers to installation, access to technologies viewed as the norm within wider society was limited or unavailable until a later point in custodial settings. Examples of such lagged access includes technologies such as telephones, televisions, and computers. In each of these cases, the roll out of these technologies within prisons in the UK was preceded and accompanied by a public debate about the appropriateness of providing access to what were viewed as luxury additions. Indeed, the introduction of a new technology within a prison setting raises questions around their intended purpose and outcome which are not asked when technology is introduced within the community. Jewkes and Reisdorf (2016) describe the difference between the readiness of decision makers to embrace communications technology within the design and construction of prisons to reduce operational demand, and the comparative caution which they describe as “almost to the point of paranoia” (p535) to introduce prisoner access to new technologies. This caution is linked to concerns that public perception will consider the inclusion of technology in a prison environment to be an undeserved privilege. Despite this caution, technology designed into prisons, is following an upward trajectory. This significant adjustment to the environment of our prisons has the potential to alter the custodial experience for those living in prison.

Reasons for Introducing Technology Within Prisons

Given that additional questions are asked around the introduction of new technologies in prison, it is vital for policy makers to make the purpose, potential opportunities, and potential risks of these financial investments clear. The reasons can be collated into the following areas.

Safety

Maintaining a safe environment for those living and working in prison is a high priority for prison managers. Safety in this context refers to keeping individuals safe from assault or self-harm, and to disrupting group violence or anti-social behaviour. Support for the wellbeing of individual prisoners will also mitigate some of the risks of harm to self, known to be increased for people in prison relative to the community (Favril et al., 2020). Aside from the punitive components, prisons remain large communities of people. They are managed by a proportionally small number of staff, and early prison design through to current design recognises the benefits of enabling staff to have broad visibility over the area that they are responsible for (Galic et al., 2017). This visibility is intended not only to increase the area that staff members can keep watch over, but also to have an associated impact of deterring anti-social behaviour in easily witnessed areas. Technology offers a clear opportunity to add to prison design and increase the area that staff can attain visibility over, for example, using closed circuit television (CCTV). More recently, body worn cameras have also provided an additional safety related tool, with the similar intentions of deterring anti-social behaviour and providing an accurate record of events, which may previously have relied on witness statements. These potential benefits of reduced anti-social behaviour, and the related improvements to physical safety, need to be weighed against the drawbacks of concerns for psychological wellbeing due to living in an environment with increased surveillance (Agustina & Clavell, 2011).

Legitimacy, Procedural Justice, and Efficiency

For the criminal justice system to operate with the broad support of the community that it serves, it is essential that it is perceived as legitimate. Increasing legitimacy can be a purpose of installing technology. Legitimacy describes the process by which the public trust the various arms of the criminal justice process (or organisations generally) to fairly apply rules and laws (Tyler, 2006). The application of this concept within prisons relies upon the presence of procedural justice (Jackson & Tyler, 2010). A procedurally just environment is one in which prisoners trust that the rules and processes which are applied to them are fair, and that there is an opportunity for them to have a voice. One aspect of prison life which it is important for prisoners to have confidence in is paperwork, for example, that a complaint, a request, or a communication with a family member is handled in an organised way, and that actions follow from their requests. The processes through which such requests have been handled in the past have involved the passing of paperwork between departments, which leads to opportunities for loss and a subsequent reduction of trust that the processes will happen. The use of technology, through which prisoners can directly input requests to the department that will action it, for example, purchasing goods, or ordering meals, is less likely to lead to error. It therefore has the potential to increase trust, and thus increase perceived legitimacy of the systems. The introduction of kiosks (computer terminals based on prison wings for the use of prisoners to carry out transactional tasks, such as ordering meals or checking the amount of money in their account), is an example of a technological innovation which has the potential to increase the efficiency of prison process. Applying the four established elements of procedural justice, voice, neutrality, respect, and trust, to prisons, Jackson and Tyler (2010) emphasise the importance of establishing order within custodial environments to achieve legitimacy. Systems which work efficiently and effectively, in which machines have an advantage over humans, are likely to be supportive of prisoner beliefs in the legitimacy of a prison and their perceptions of procedural justice.

Digital Skill Development and Communication

As discussed in Chapter 1, a further purpose of introducing technology to prisons has been to develop the digital skills of prisoners. Champion and Edgar (2013) reference the importance of designing custodial environments that provide opportunities for prisoners to use technology, noting that "the digital divide between people in prison and in the community is rapidly widening and will make resettlement more difficult if these skills have not been developed" (p3). They argue that the dearth of access to technology within prison further separates those in custody from the community. Prisoners are subject to a double hit, in that the organisations set up to support issues that research has linked to reduced reoffending, such as employment and accommodation (May et al., 2008), are now often accessed online. Those leaving prison without the skills or access to digital platforms may find a digital barrier to the support needed. It might be expected that this detrimental effect increases with increased sentence length.

Examples of technologies available in some prisons to develop technological capabilities are the "email-a-prisoner" scheme, telephones, and more recently, in-cell telephony. Each of these technologies enable prisoners to access communication technologies which are widespread outside prisons, they normalise the custodial environment by increasing similarity with the external community. Enabling continuous access to technology during a prison sentence has the potential to increase digital literacy and reduce the current digital divide between prison and the community. Such access may be through prison education departments, as explored in the following section, or integrated within other parts of prison life.

Education

The use of technology in education is becoming widespread within prisons. Within HM Prison and Probation Service (HMPPS), the Virtual Campus (a computer accessed educational platform), offers

access to resources which enable people held in prisons to study up to degree level. While prisoners have been completing degree level qualifications prior to the introduction of the Virtual Campus, the ability to access more up to date materials, without the need to send books in and out of prison, facilitates this more readily. Pike and Adams (2012) explored the experience of prisoners with access to the virtual campus. In their study, prisoners reported the value of a "student identity; a lifeline" (p370) that the Virtual Campus provided, giving hope for their futures and a pathway away from offending. Equipping education departments with technological resources to promote learning and skills can therefore be a further rationale for prisons to install technology. Increasing educational levels of prisoners, contributes to overall prison service objectives to rehabilitate prisoners, which will be further explored in the following section.

Rehabilitation

A core aim of prisons is to rehabilitate those that are imprisoned, and technology has begun to play a role in achieving this objective in some prisons. Face to face Offending Behaviour Programmes[1] (OBPs) are widespread within prison settings. Individuals are selected to participate in OBPs based on assessments of risk and need; the most common model is a group structure of around eight participants and two facilitators. An adaptation to this model has been attempted in prisons in England and Wales, making use of Complementary Digital Media (CDM), such as brief video clips. These can be accessed by prisoners in their cells and have been designed to address the same thinking skills addressed by the face-to-face programmes (Morris & Bans, 2018). Morris and Bans (2018) highlight the value of developing the CDM in a co-production model with staff members working alongside a client group to ensure that the materials have validity to the group that they have been produced for. While not replacing rehabilitative face-to-face therapeutic approaches, technology in prisons has to date been

[1] Group or individual programmes for prisoners, designed to reduce risk of reoffending, often based on a cognitive behavioural model.

used to complement existing therapeutic approaches to rehabilitation and to reach a wider group of prisoners than is otherwise possible. Consistent with the face-to-face approaches, the use of CDMs is for the purpose of decreasing antisocial behaviour both on release from prison and within custody. The next section addresses a purpose focused on the experience of prisoners while in custody, that of entertainment.

Entertainment and Distraction

Perhaps one of the most controversial rationales for the introduction of technology in prison is to provide entertainment for prisoners. Hadlington and Knight (2022) in a survey of 237 members of the public, found a majority felt that prisoner access to technology was a luxury that should be earned. Participants in the study also felt that public money should not be used to fund technology access for prisoners. The counter argument to this is that providing technologies which entertain prisoners, such as television, may enable a more rehabilitative culture, improve wellbeing, reduce conflict, and enable increased connections with those outside prison (Knight, 2016). As described in the section on safety above, supporting prisoner wellbeing while in prison, also has the potential to increase safety of prisoners through a reduction in self-harming behaviour. While some public opinion may be opposed to providing technologies that could be viewed as luxuries for prisoners, one potential purpose of installing technology may be to provide entertainment for the purpose of maintaining wellbeing. The next section addresses a purpose which may align more closely with the priorities of the public, that of saving money.

Cost Saving

Technologies also have the potential to save public money. Most commonly, this is due to the technology replacing the need for a member of staff to carry out a particular task. For example, the method of collecting meal requests for each prisoner is often achieved through the prisoner completing

a paper form. These forms are gathered by officers or prisoners, and taken to a central office, where the requests are collated, and information shared with the kitchen. Some prisons in England and Wales have now introduced prisoner self-service technology, known as kiosks, these are wing based computers used by prisoners for a variety of transactional tasks, such as meal ordering. In these prisons, the task of gathering, forwarding, and collating the meal request forms is no longer needed, as the information is shared directly with the kitchen. Using this digital approach, potential cost savings could be made through the reduced staff time required to carry out the tasks. As mentioned in the section on procedural justice, a digital system is also likely to be less fallible than a human process and likely to increase confidence from prisoners in the prison processes. While technology requires initial and ongoing investment, the efficiencies that it can achieve in prison processes have the potential to save public money.

Technologies Currently Used in Prisons

Terminology for technology and digital applications is loosely defined. In their review of technology and recommendations for advancements of technology use within the National Offender Management Service (which at the point of the report covered prisons in England and Wales), Champion and Edgar (2013) described the variety of potential technologies for prisons. The types of technology they described included computers, telephones, video conferencing tools, wing-based pc terminals, e-readers, internet, and intranet technology. This is a broad group of technologies varying widely in terms of recency of development (for example internet access being more recent than telephony), function (or purpose) of the technology, and cost of use. In addition to prisoner interfacing technology, there have also been notable introductions of staff facing technologies, for example the use of fingerprint recognition through which staff draw keys to an establishment, internal communications (email and video communication technology), and gamification within recruitment. Security departments have

needed to keep pace with new challenges such as the use of drones to deliver contraband items within prisons, and to continue to manage the challenge of detecting mobile phones.

As described above there are several categories of reasons for introducing technology to prisons, and the trajectory of technology use is upward. The variety of types of technology, have adjusted the prison environment in different ways. While the literature is at an early stage in this field, the environmental adjustments created by technology may alter the prison experience for prisoners in positive or negative ways.

Aims and Objectives

This review is essential given the appetite and momentum for advancing technology installation within prisons, in terms of both the advancing sophistication, and also its reach. An understanding of the impact of technology on prisoners, in relation both to opportunities and risks, will assist to anticipate the consequences of further roll out. It will also provide policy makers with guidance as to how to implement and manage technology roll out, decisions about which are generally made within a context of limited funding. The aim of this review is to systematically explore the available literature on the use of technology to develop environments which support rehabilitation within prisons. The review aims to aggregate the qualitative, quantitative, and mixed methods evidence to understand how technological infrastructure innovations in prisons affect the experiences of those living in prisons. The review is particularly concerned with technological innovations which target the environment or climate and therefore does not cover innovations which (though significant in relation to prison architecture and design) are primarily designed to impact on prison safety (such as cameras or automated gates). It also does not cover education or therapy which happens to be delivered via a digital format, as these approaches are intended to impact on an individual's learning or treatment rather than the environment or climate of the prison.

Method

Protocol and Registration

Searches of the PROPSERO database, and the Cochrane Library database, in addition to searches of relevant publication databases (October 2020), were made to determine if the proposed review duplicated existing work. The author did not find evidence that the question had been previously explored.

A protocol for the systematic review (Appendix A), developed in October 2020 and following the PRISMA guidelines (Moher et al., 2015) was developed to structure the review process. This was registered with PROSPERO on 27/11/20[2] to avoid duplication of research, to minimise selection bias, and to ensure transparency within the method of the systematic review.

Identification of Type of Review

The type of question asked within a systematic review in part determines the type of and format of review that follows; incorrect selection of review format has been identified as a potential pitfall of mixed methods systematic reviews (Lizarando et al., 2022). The review question in this case, described above in aims and objectives, can be answered with both qualitative and quantitative studies, for this reason, following the guidance for mixed methods systematic reviews (Lizarando et al., 2020), a convergent integrated approach was taken to the data synthesis. This process is described in more detail in the Data Synthesis section below.

[2] https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42020218284

Search Strategy

Scoping Search

The initial search terms were developed by the researcher's knowledge of the literature base, incorporating commonly used words relating to technological innovations (such as digital, technological, technology, computers) and for terms used in relation to prison settings (for example, prison, custody, jail). Having generated a list of the items, the list was consolidated where stem terms (e.g., tele* to cover both telephone and television) could be used. After testing the search terms, additional words were added through observation of the results (for example 'gaol' was added to the prison settings terms).

Scoping searches were carried out in October 2020 to determine relevant databases. Initial search terms were tested across several databases and adjusted to ensure a broad inclusion of articles. In addition to those used in the final search, listed in the section below, databases explored in the scoping process were PubMed and Applied Social Sciences Index and Abstracts. These were not included in the final search as they either added articles which were irrelevant to the current systematic review aims and objectives, or they replicated included databases.

Final Search Terms and Databases

The databases included in the final search retrieved known articles that met the inclusion criteria, and included multidisciplinary databases known to perform well in relation to retrieval performance for systematic reviews (SCOPUS, Web of Science, and Academic Search Complete (Bramer et al., 2017)) as well as subject specific databases (PsycINFO, LISTA and Criminal Justice Abstracts). The databases identified for the final search are shown in Table 2.1.

Table 2.1

Databases Searched in Systematic Review

Database name	Description of database
Academic Search Complete	Database covering many areas of academic study
Criminal Justice Abstracts	Database of all areas related to criminal justice and criminology.
Library, Information Science and Technology Abstracts (LISTA)	Database of Library, Information Science & Technology Abstracts.
PsycINFO	Database of international literature in psychology and an array of disciplines related to psychology.
Scopus	Citation database of peer-reviewed academic content in the fields of Life Sciences, Physical Sciences, Health Sciences, Social Sciences and Humanities.
Web of Science	Database of all areas related to criminal justice and criminology.

Note: Academic Search Complete, Criminal Justice Abstracts and LISTA were accessed through EBSCO

The search terms used for the final database searches were “Prison*” OR “jail” OR “gaol” OR “custody” AND “internet” OR “tele*” OR “video” OR “computer*” OR “tv” OR “device” OR “digital” OR “intranet” OR “kiosk” OR “phone” OR “technolog*”.

In addition to the databases searched above, grey literature sources were included to attempt to include studies not available through externally published sources. A search of Google Scholar was also included at this point to assist with grey literature searching; Google Scholar includes articles published in academic sources as well as grey literature and is a recommended source alongside traditional databases within systematic reviews (Haddaway et al., 2015). Haddaway et al. (2015) found that between 8-39% of articles returned in Google Scholar searches were classed as grey literature. The

search options possible in Google Scholar differ to those in traditional academic databases and therefore these were adjusted (shown below) while retaining the meaning contained in the search thread used for the academic databases. The methods used to identify relevant grey literature were the following:

1. Google Scholar (first 100 items) using search terms “Prison” AND “internet” OR “television” OR “video” OR “computer” OR “tv” OR “device” OR “digital” OR “intranet” OR “kiosk” OR “phone” OR “technology”. The search options for Google Scholar did not allow the same combination of AND / OR options as those used for the academic database searches, for this reason, the most commonly used term for custodial environments “prison” was used in combination with ‘any one of’ the list of terms used for technology. Google Scholar returns up to 1000 articles for each search, though the algorithm through which these are organised is not publicly available. There is no agreed number from Google Scholar to be used when searching for grey literature in a systematic review (Haddaway et al., 2015), a decision was made to review the first 100 items returned.
2. Unpublished theses (through ETHOS (British Library e-theses online service) and IREP (Nottingham Trent University’s Institutional Repository).
3. NHS Health Research Authority.
4. Hand searches through the references of final selected articles.

Study Selection

Having identified search terms and databases to be used, a protocol was developed, based on the Population, Intervention, Comparator and Outcome (PICO) search framework (Huang et al., 2006). This specified the inclusion and exclusion criteria that would be applied to the selection of studies. The PICO criteria are recommended for use in systematic reviews to ensure key criteria are established prior

to searching (McKenzie et al., 2022). The aim of the protocol was to identify inclusion and exclusion criteria to ensure that the systematic review appropriately addressed the overarching question. Studies were selected through application of the criteria described in Table 2.2.

Table 2.2

Inclusion and Exclusion Criteria for Systematic Review

PICO item	Inclusion	Exclusion
Population	• Participants are people living or working in prison (or equivalent holding establishment for younger aged people). • Participants are of an age of criminal responsibility (dependent on the country where the study was conducted, for example, 10 years old for England, Wales and Northern Ireland and 12 years old for Scotland).	• Participants are living in forensic settings other than prisons, such as forensic secure hospitals.
Intervention	• Studies involve technological innovations in prison infrastructures, such as computers in cells, access to the internet, use of telephones. • Technological innovations were intended (at least in part) to achieve a rehabilitative environment, to introduce resource efficiencies, or to prepare those serving	• The technological innovation was for a psychological or therapeutic intervention (where outcomes focus on effectiveness of therapy rather than the impact of the technology). • The purpose of the technology was primarily for the purpose of increased safety rather than for rehabilitation (for

PICO item	Inclusion	Exclusion
	sentences for life on release.	example, CCTV or body worn cameras).
Comparator	• Not specified due to the broad nature of the interventions studied.	
Outcome	• Measurable psychological and behavioural impact for those living and working in prisons.	
Language / Country	• Reports written in English. • All countries were included for study location.	• Reports written in language other than English.
Publication type	• Quantitative, qualitative, and mixed method studies. • Journal articles. • Theses.	• Opinion articles. • Book chapters. • Literature reviews. • Articles which did not report on a research study.

Having identified the search criteria, databases to be searched, and inclusion and exclusion criteria, a four-stage search process was followed, as shown in Table 2.3.

Table 2.3

Stages of Search Process in Systematic Review

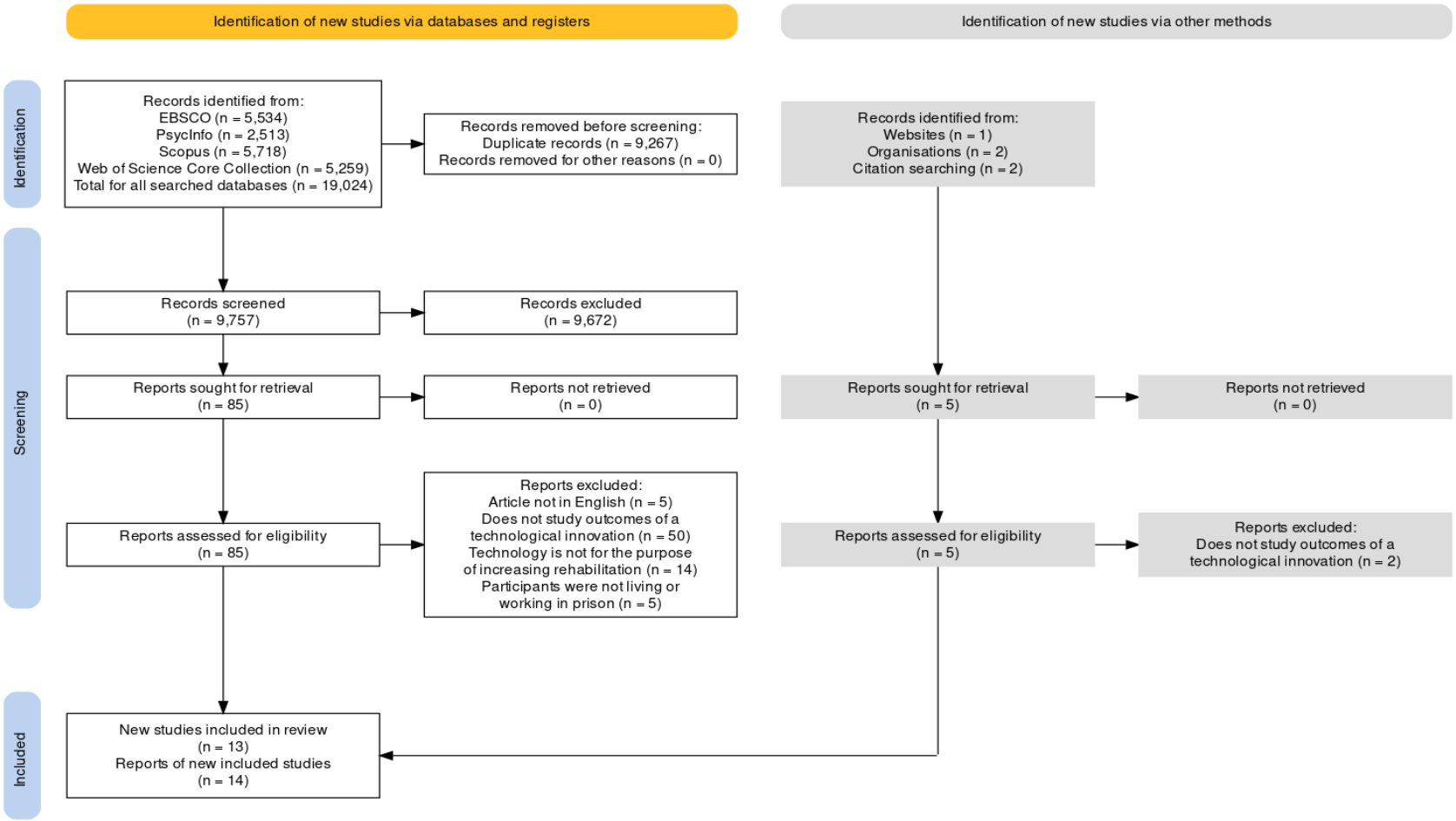
Stage of search process	Description
Stage 1	Search of identified databases and removal of duplicates resulting in removal of 9267 reports as shown in Figure 2.1. Searching of grey literature, retrieved five reports, two of which were identified from citations in other papers, two through organisation searches (NHS research authority) and one through Google Scholar.
Stage 2	Screening of reports from Stage 1, initially by title (reduced to 619) and then by abstract (reduced to 85), against the criteria described in the protocol (Table 2.2).
Stage 3	The full text of articles screened in from Stage 2 were reviewed against the eligibility criteria to identify the final set of 13 studies.
Stage 4	Data was extracted from the final set of articles identified at Stage three. The data extracted from each article (shown in Table 2.6) was: design of study, participant details, type of technological innovation, outcomes measured, results of study, conclusions.

The PRISMA flow chart, Figure 2.1, which follows the guidelines of Page et al. (2021) and was created using Shiny app (Haddaway et al., 2022), details the numbers of articles selected and excluded at each stage to identify the final set of 13 articles.[3]

[3] Report selection was carried out by the author of the thesis. One of the supervisory team double scored up to 5% of articles at Stage 2, at which title and abstract were filtered. At Stage 3, in which the final articles were filtered, up to 10% of the articles were double scored by the author's Director of Studies. Any arising discrepancies were discussed to reach a consensus.

Figure 2.1

Prisma Flowchart of Search Strategy



Note: 14 reports were identified through searching database and other methods. Two reports described the same study, hence the final number of 13 studies.

Quality Appraisal Assessment

A quality appraisal assessment was carried out to ascertain the extent to which the selected studies had followed methodological best practice for the study design that they had adopted. This was used to inform the data synthesis process and the confidence that could be placed in the findings. The research question could be answered using both qualitative and quantitative data, therefore, the final set of articles, included quantitative, qualitative, and mixed method designs.

Assessing the quality of studies is an important step within a systematic review (Munn et al., 2023), as greater confidence can be placed in the outcomes of studies which follow a rigorous methodology. As the processes for producing systematic reviews have refined, so too have the recommendations for applying assessments of study quality. Higgins et al. (2011) summarised the collated views of a group of statisticians who argued against the use of quality checklists within the quality assessment stage of systematic reviews. The concern was that quality checklists included criteria which assessed the quality of writing, but that this was not necessarily linked to the quality of the research. Munn et al. (2023) recommend a focus on risk of bias rather than assessment of study quality. A further concern that has been highlighted around quality checklists is the use of global summary ratings, such as low, medium, high (Hong et al., 2018) as the reader of the review is provided with limited information regarding the specific reasons leading to the ratings. Hong et al. (2018) instead recommends the use of a table to illustrate the individual ratings of studies across relevant items linked to risk of bias.

Available tools to assess bias and methodological robustness were considered for use within the current systematic review, including the possibility of using separate quantitative and qualitative assessment tools. Given the above critical reflections and the heterogeneity within the study designs of the final set of studies, a tool designed to assess bias and quality across study design, and which did not rely on a global rating, was sought. The Mixed Methods Appraisal Tool (MMAT) (Hong et al., 2018), was selected and applied to the final set of 13 reports. The 2018 version of the tool was used.

The tool involves separate rating criteria for five study types: qualitative, quantitative randomised controlled trials, quantitative non-randomised trials, quantitative descriptive, and mixed methods. Each method type is rated on five criteria for the relevant component parts, mixed method studies are rated on 15 items (for the qualitative and quantitative components separately, in addition to ratings for the mixed methods aspect). The tool does not recommend the use of global ratings, but instead suggests reporting of scores. The criteria for assessment are shown in Table 2.4. The assessment was made by the author, with the option to discuss with supervisors where the decision for the rating was unclear.

Table 2.4

MMAT Criteria

Category of study designs	Methodological quality criteria
1. Qualitative	1.1 Is the qualitative approach appropriate to answer the research question?
	1.2 Are the qualitative data collection methods adequate to address the research question?
	1.3 Are the findings adequately derived from the data?
	1.4 Is the interpretation of results sufficiently substantiated by data?
	1.5 Is there coherence between qualitative data sources, collection, analysis, and interpretation?
2. Quantitative randomized controlled trials	2.1 Is randomization appropriately performed?
	2.2 Are the groups comparable at baseline?
	2.3 Are there complete outcome data?
	2.4 Are outcome assessors blinded to the intervention provided?
	2.5 Did the participants adhere to the assigned intervention?
3. Quantitative non-randomized	3.1 Are the participants representative of the target population?
	3.2 Are measurements appropriate regarding both the outcome and intervention (or exposure)?
	3.3 Are there complete outcome data?
	3.4 Are the confounders accounted for in the design and analysis?
	3.5 During the study period, is the intervention administered (or exposure occurred) as intended?
4. Quantitative descriptive	4.1 Is the sampling strategy relevant to address the research question?
	4.2 Is the sample representative of the target population?
	4.3 Are the measurements appropriate?
	4.4 Is the risk of nonresponse bias low?
	4.5 Is the statistical analysis appropriate to answer the research question?
5. Mixed methods	5.1 Is there an adequate rationale for using a mixed methods design to address the research question?
	5.2 Are the different components of the study effectively integrated to answer the research question?
	5.3 Are the outputs of the integration of qualitative and quantitative components adequately interpreted?
	5.4 Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?
	5.5 Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?

Note: Source - Hong et al., 2018

The MMAT ratings for each of the studies selected is displayed in Table 2.5. The MMAT requires an answer of “yes”, “no” or “can’t tell” for each of the criteria. Where a “can’t tell” rating was made, the author attempted to contact the authors of the paper to request further information. An example of such involved contacting the authors (Murdoch & King, 2020) to check if the survey had been pre-tested prior to use, for the purpose of rating item 4.3. The rating was adjusted from “can’t tell” to “no” following the response. It was not possible to clarify all “can’t tell” ratings, these are indicated with a “?” in Table 2.5.

As can be seen from Table 2.5, the quality appraisal varied across studies. As the authors of the MMAT tool (Hong et al., 2018) recommend, studies deemed of lower methodological quality were not removed from the final sample set, but the transparency provided by Table 2.5 indicates the level of confidence that might be placed in varying studies when drawing final conclusions. The differences in quality were also considered in the data synthesis, to indicate where greater confidence in the outcomes might be placed. Where studies received a rating of “no” consideration was paid as to whether this study was a heavy contributor to any of the findings of the systematic review. In each case, there were further studies which supported the same findings providing some confidence that the risk of bias was not distorting or significantly shaping the findings.

Table 2.5

Summary of Quality Appraisal of Included Articles

Studies	Criteria from the Mixed Methods Appraisal Tool																									
	Qualitative					Quantitative RCT					Quantitative non-RCT					Quantitative Descriptive					Mixed Methods				
	1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3	2.4	2.5	3.1	3.2	3.3	3.4	3.5	4.1	4.2	4.3	4.4	4.5	5.1	5.2	5.3	5.4	5.5
Booth (2020)	✓	✓	✓	✓	✓																				
Duwe and McNeeley (2021)											✓	✓	✓	✓	✓										
Murdoch and King (2020)	✓	✓	✓	✓	✓											✓	✗	✗	✓	✓	✗	✓	✓	✓	✓
McDougall et al. (2017)											✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Kenis et al. (2010)	✓	✓	?	?	✓																				
Anderson and Bedford (2017)	✓	✓	✓	✓	✓																				
Chan et al. (2019)	✓	✓	✓	✓	✓																				
Knight (2012)	✓	✓	✓	✓	✓																				
Ribbens and Malliet (2014)	✓	✓	✓	✓	✓																				
Jewkes (2002)	✓	✓	✓	✓	✓																				

Studies	Criteria from the Mixed Methods Appraisal Tool																			
Bonini and Perrotta (2007)	✓	✓	✓	✓	✓						✓	×	✓	×	✓	×	×	×	×	?
Churcher (2008)	✓	✓	✓	✓	✓															
Palmer et al. (2020)	✓	✓	✓	✓	✓		✓	✓	×	✓	✓						✓	✓	✓	✓	✓

Note: ✓ = study satisfied criterion; × = study did not satisfy criterion; ? = information was not available to evaluate the criteria. See Table 2.4 for description of criteria.

Data Extraction

Data was extracted from the 13 reports using an adapted data extraction template based on the Joanna Briggs Mixed Methods data extraction template (Lizarondo et al., 2020). To synthesise the data from the variety of methodologies found in the final set of studies, a convergent integrative approach was employed. A process of data transformation was used to 'qualitise' the quantitative data as recommended by Lizarondo et al., (2020). An example to illustrate the transformation of a quantitative finding, using an example extracted from McDougall et al. (2019), is provided below:

"Of the 743 respondents, 93% thought the kiosks were easy or very easy to use, even though very little formal training was offered, and 7% thought the kiosks were difficult or very difficult to use".

This was transformed to a qualitative piece of data by using the code: "Nearly all participants found the kiosks easy to use without formal training". Outcome data for qualitative studies, or qualitative components of mixed methods studies, included findings and quotes from participants to support themes and sub-themes and author conclusions. The data extracted is shown in Table 2.6.

Table 2.6

Summary of Content of Final Articles

Article (ID)[4] number	Authors, date & country	Participants and setting (gender included if specified)	Type of study and data collected	Technology introduced	Phenomena of interest	Summary of relevant findings
1	Booth (2020) England	15 women prisoners serving prison sentences.	Qualitative. Interviews with prisoners who had children outside prison.	Telephones.	Prisoners' experiences of telephone contact with their children during their sentence.	Four themes were identified: • Reconnecting in the first weeks – the challenges of making communication in the initial period in custody, and the emotional need to do so. • Cost of calling – the charges for making calls limited the contact that mothers had with their children. • Telephoning privileges – the prisoner's status on the prison behaviour scheme affected the access to the phones and the frequency of calls to children. • Inconsistencies across prisons – challenges of different prisons providing telephone access at different times. In-cell phones were noted to provide flexibility and a benefit in this regard.
2	Duwe and McNeeley (2021)	885 prisoners, men and women, who experienced	Quantitative. Reconviction rates.	Video visits.	Reconviction rates compared with a control group of prisoners who did	Summary of findings: • Those who received video visits were significantly less likely to be involved in general offending or felonies, but no

[4] Identification

Article (ID)[4] number	Authors, date & country	Participants and setting (gender included if specified)	Type of study and data collected	Technology introduced	Phenomena of interest	Summary of relevant findings
	USA	video visits during their sentences.			not receive a video visit.	significant difference for violent reoffending. • Greater number of visits linked to greater reduction in reoffending.
3	Murdoch and King (2020) USA	10 men and 2 women prisoners who had experienced using video visits were interviewed. 259 prisoners, men and women, in jail participated in a survey.	Mixed methods. Qualitative – interviews with 12 participants, transcribed and entered onto Nvivo to identify themes. Quantitative – survey to those living at the jail. Descriptive statistics generated with SPSS.	Video visits.	Participants views on experience of using video visits.	Interview participants responses were grouped into themes of: • Regular use of video visits and scheduling of video visits was convenient. • Technological difficulties were common and costs for additional video visits were high. • Video visits helped to maintain relationships. • Video visits led to improvements in behaviour and assisted with resettlement. • Video visits were thought to be less personal but more convenient that in person visits. • Survey respondents disagreed that it improved behaviour or chances of resettlement and also expressed preference for in person rather than video visits.

Article (ID)[4] number	Authors, date & country	Participants and setting (gender included if specified)	Type of study and data collected	Technology introduced	Phenomena of interest	Summary of relevant findings
4	McDougall, et al. (2017) England and Wales.	Prisoners held at 13 prisons. Survey was completed by 743 prisoners at 1 prison.	Mixed methods. Quantitative: stepped wedge design, using adjudications[5], offending behaviour programme completions and reoffending rates. Analysed using longitudinal multi-level modelling for adjudications. Wlicoxon signed rank was used for the OBP data. Reoffending data was compared to matched	Kiosks (wing-based computers).	Adjudications, OBP completion rate, reoffending, experience of using the kiosks.	Summary of findings: • Statistically significant reduction in adjudications following introduction of kiosks. This impact reduced over time – with adjudications gradually rising. • Statistically significant reduction in reoffending following introduction of kiosks. • Increase in OBP completions – but not statistically significant. • Most common use of kiosks were for aspects that involved prisoner led transactions (checking balance, ordering items). • 55% of prisoners in survey felt that the kiosks had given them more control over their lives.

[5] A prison disciplinary process followed when a prisoner has broken a prison rule.

Article (ID)[4] number	Authors, date & country	Participants and setting (gender included if specified)	Type of study and data collected	Technology introduced	Phenomena of interest	Summary of relevant findings
			prisons without kiosks. Process evaluation (not fully reported in this paper – but this paper referred to an unpublished report of the process evaluation) - involving a survey via the kiosks.			
5	Kenis et al. (2010) Netherlands	150 prisoners, men, and 15 prison staff.	Qualitative. Observations and interviews with prisoners and staff. Process tracing was used to analyse the data.	Touchscreen computer in cell to order meals, manage money, book activities etc. Electronic ankle tags to locate prisoners.	Staff efficiencies and safety of unit.	Summary of findings: • Technical problems were experienced with the tracing technology and the touch screens. • The prison showed increased effectiveness and increased safety, though it is not possible to say if this was the result of the technology or the additional innovations which include shared group cells and a self-managed officer team.

Article (ID)[4] number	Authors, date & country	Participants and setting (gender included if specified)	Type of study and data collected	Technology introduced	Phenomena of interest	Summary of relevant findings
				CCTV		
6	Palmer et al. (2020) England and Wales	32 participants in prisoner interviews. 21 focus groups (total participant numbers within focus groups not specified). 2750 prisoners completed the survey.	Mixed methods: Qualitative data collected by interview and focus groups. Quantitative data collected by survey and management information.	In-cell computers, in-cell telephones, and kiosks.	Prisoner confidence in using IT, prisoner and staff relationships, communication of knowledge, prisoner wellbeing, staff satisfaction, and staff time.	Summary of findings: • Telephones, kiosks, and laptops improved communication and access to transactional processes. • Some staff and prisoners were reluctant to use the new technology. • The technologies increased agency and autonomy for prisoners. • The kiosks and laptops led to a reduction in staff time for some tasks.
7	Anderson and Bedford (2017) England, Wales, and Australia	Prisoners and staff at prisons in England and Wales and at a prison in Australia.	Qualitative case study design.	Radio.	Prisoner engagement with the radio shows.	Summary of findings: • There are benefits to prison radio (a radio station operating and broadcast inside a prison) and prisoner radio (radio programmes made by prisoners or prisoners' families which broadcast to communities on criminal justice subjects). • Media production by prisoners plays an empowering and transformative role.

Article (ID)[4] number	Authors, date & country	Participants and setting (gender included if specified)	Type of study and data collected	Technology introduced	Phenomena of interest	Summary of relevant findings
8	Bonini and Perrotta (2007) Italy	59 prisoners completed the survey, men and women. 12 prisoners involved in the interviews, men.	Quantitative and qualitative.	Radio.	Function that radio serves in prison.	Summary of findings: • Lower rates of radio listening reported inside prison relative to listening outside prison. • Connection – prison builds connections between people inside and outside prison. • Isolation – technology is soothing in a busy space and can also provide solitude. • Dailiness – technology provides routine for people living in prison.
9	Chan et al. (2019) Singapore	16 prisoners, men, age 16-21.	Qualitative: thematic analysis of interviews transcripts.	Podcasts via radio.	Prisoners' experiences of listening to the prison radio podcasts.	Three themes were identified in the analysis: • Reflective thinking – podcasts led to increased reflection to change thinking. • Increased motivation to change – podcasts motivated listeners to take action. • Structured routines – podcasts provided routine and fostered good daily habits.
10	Churcher (2008) USA	33 prisoners involved in interview, men. 5 prison staff involved in interview.	Qualitative: Ethnographic study.	Prison produced television and radio.	Prisoners' experiences of listening to and making prison radio and prison television.	Summary of findings: • Technology is a motivation to prisoners and helps to pass time in prison. • Technology is a voice for people in prison. • Technology builds connections between prisoners.

Article (ID)[4] number	Authors, date & country	Participants and setting (gender included if specified)	Type of study and data collected	Technology introduced	Phenomena of interest	Summary of relevant findings
		Wider prison staff and prisoners involved in observational study.				• Technology supports self-governance within prison.
11	Jewkes (2002) UK	62 prisoners involved in interviews, men. Prison officers and Governors (number not reported). 17 Senior managers involved in questionnaire. Wider prison staff and prisoners involved in observational study.	Qualitative: Ethnographic study.	Media (television, radio & newspapers) in prison.	Media use in prisons – with a particular interest in the introduction of in-cell television.	Summary of findings: • In-cell television allows each individual to make their own viewing choices relative to wing-based viewing where the most dominant individuals select the programme. • In-cell televisions are a form of controlling prisoners' behaviour through their link to the incentives and earned privileges scheme.

Article (ID)[4] number	Authors, date & country	Participants and setting (gender included if specified)	Type of study and data collected	Technology introduced	Phenomena of interest	Summary of relevant findings
12	Knight (2012) UK	19 prisoners participated in interviews, men. 9 staff members participated in interviews. 9 prisoners completed a diary.	Qualitative: Ethnographic study.	In-cell televisions.	Impact of in-cell television on social relations.	Summary of findings: • Television helps prisoners to self-regulate their emotions (described as a quasi-therapeutic tool). • Television was found to normalise prison environment. • Television provides a more comforting environment. • Television provided opportunities for prisoners to interact with the social world beyond the prison.
13	Ribbens and Malliet (2014) Belgium	17 prisoners, men, participated in retrospective think aloud protocol and interviews.	Qualitative – used principles of grounded theory.	Digital games.	Link between needs and stress of prison, and motives to play gital games.	Summary of findings: • Digital games helped to pass time. • Digital games provided mental challenge – to maintain mental abilities. • Digital games helped to build relationships with others (through discussing the game and playing together). • Digital games avoid having to think about the deprivation of liberty. • Digital games did not negate effect of imprisonment on locus of control but did divert attention from it.

Data Synthesis

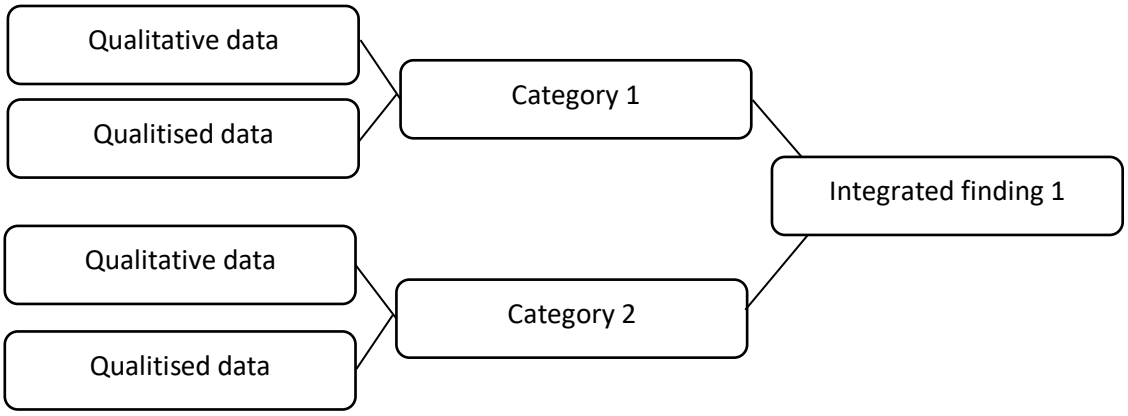
The data extracted from the 13 reports was synthesised to identify patterns in the findings. Data synthesis for systematic reviews involving mixed methods studies has received attention in the literature over recent years. While there is recognised merit in combining the outcome findings of quantitative studies and the experiential findings of qualitative studies, in addition to those from mixed methods studies, there is complexity in combining studies with different designs. To assist with this, in 2014 the Joanna Briggs Institute Mixed Methods Methodology group was formed to develop guidelines for researchers working in this area. Guidance from this group was revised and published in 2020 (Lizarando et al., 2020) and highlights the importance of selecting the process of data integration dependent on the type of research questions being asked. Lizarando et al. (2022) published a further paper highlighting common pitfalls made by researchers completing systematic reviews involving studies with mixed methodologies. In addition to other recommendations, and consistent with systematic review guidelines more broadly, Lizarando et al. (2022) highlight the importance of transparency in the process of describing data transformation and integration. The following paragraphs detail the process applied in the current study to attempt to address this potential pitfall.

The Joanna Briggs Institute manual for Evidence Synthesis (Aromataris & Munn, 2020) describes the options for data synthesis with a mixed methods systematic review, namely meta-ethnography, narrative synthesis, and thematic synthesis (Thomas & Harden, 2008). In place of these approaches, they recommend the use of meta-aggregation, which they describe as being “sensitive to the nature and traditions of qualitative research while being predicated on the process of systematic review” (Lockwood et al., 2020). This approach does not aim to reinterpret the primary findings of the research studies but rather to produce statements that are of practical value to policy makers and practitioners.

The process used to synthesize the data, as recommended by the Joanna Briggs Institute (Lizarando et al., 2020) is displayed in Figure 2.2 below. First, the qualitative or qualitised data described in Table 2.6 were extracted from the studies. The author then read and re-read these pieces of data, to identify categories (similarities or themes in the data that could be summarised in brief phrases). The process of re-reading and familiarisation with the data continued until no further categories could be combined. One category summarised two or more pieces of data extracted from the studies. The categories were then reviewed (returning back and forth to the original data) and analysed to produce integrated findings. Definitions for the terms used in Figure 2.2 can be found in Table 2.7.

Figure 2.2

Process for Synthesising Data in Mixed Methods Systematic Review



Note: Source - Lizarondo et al. (2020)

Table 2.7

Definitions of Terms Used for Process of Data Synthesis Displayed in Figure 2.2

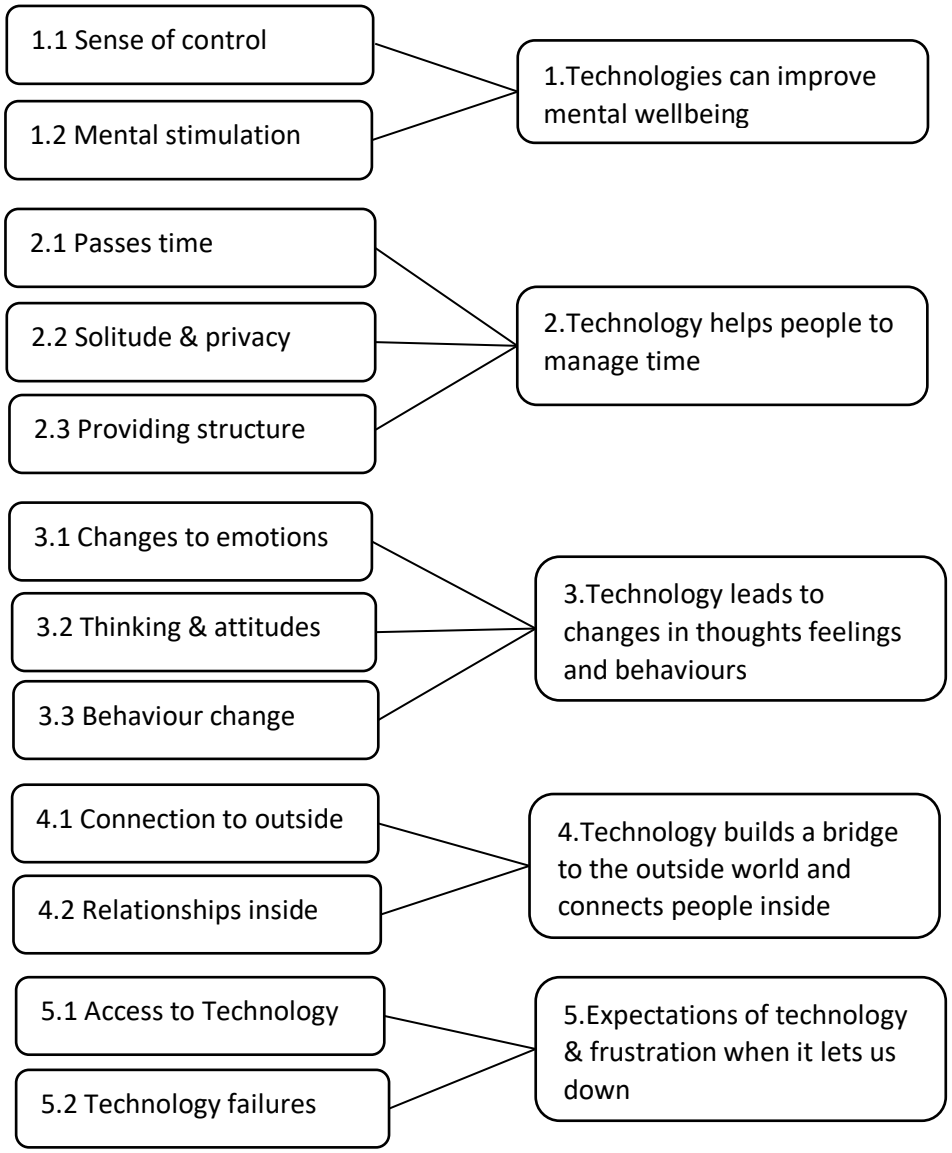
Label	Definition
Qualitative data	Findings directly extracted from qualitative studies or the qualitative elements of a mixed methods study.
Qualitised data	A textual description of the findings of quantitative studies or the quantitative elements of a mixed methods study.
Category	Repeated examination of the qualitative data and qualitised data is carried out to identify similar groups of two or more pieces of data, described as categories.
Integrated finding	The categories (and the original data) are then reviewed again to identify overall findings (integrated findings) that form the outcomes of the systematic review.

Findings and Discussion

The findings and discussion have been combined in the following section to allow the categories to be analysed in the context of the available literature. The process of data synthesis identified 12 data categories and five integrated findings, described below, and illustrated in Figure 2.3. The article ID numbers from Table 2.6 are used to identify the studies within the text.

Figure 2.3

Categories and Integrated Findings Following Data Synthesis



1. Technologies can Improve Mental Wellbeing

Custodial settings often involve repeated daily routines and lack mental stimulation for prisoners, this can lead to a lack of drive and motivation for those living within them. Lack of drive and motivation is compounded by the reduction in control that prisoners have over their lives within prison relative to people living outside prison. Finding 1 is based on evidence demonstrating that technology counters this by keeping people alert and motivated and was based on data from seven (**4**, **6**, **7**, **8**, **9**, **12** & **13**)[6] of the final studies. The technologies explored in the studies (podcasts (**9**), kiosks (**4** & **6**), radio (**7** & **8**), television (**12**) and computer games (**13**)) were associated with increased feelings of control for prisoners, and provided mental stimulation to offset the banality of the prison routine. This finding stemmed from two categories of evidence: sense of control and mental stimulation.

1.1 Sense of Control

The first of these related to prisoners feeling that they had a greater degree of control over aspects of their lives due to technology access. This evidence was found in part from the two mixed methods studies investigating access to digital transactional services (for example, checking account balance, ordering meals, booking visits) through wing based or in-cell computers (**4** & **6**). When prisoners were able to perform these transactions directly through a computer, relative to the standard process of asking an officer to check these on their behalf, prisoners reported feeling more in control. For example, Palmer et al. (2020) noted that prisoners commented that the wing-based computers provided a digital trail which could be used to track applications made to departments. This was more reassuring than a paper-based system through which applications could go missing. By providing the prisoners with information relating to their request, prisoners felt that they had greater agency and autonomy within the process. Similarly, in McDougall et al.'s (2017) study of wing-based computers in prisons, 55% of the 743 prisoners who responded to their survey reported

[6] Numbers are hyperlinked to the relevant articles in Table 2.6

feeling more in control of their lives as a result of kiosk access. Deci and Ryan (2000), in describing Self-Determination Theory posit that all humans are driven to meet a set of innate needs, which include those of achieving competence, relatedness and autonomy. This motivation they suggest is core for humans and carries evolutionary advantages. The prison environment, with restrictions to liberty and day-to-day task agency has the potential to decrease opportunities to experience and exercise self-determination. This category of findings suggests that certain technological innovations, particularly those that provide transactional services, have the potential to alter the opportunities for prisoners to experience and exercise self-determination leading to an increased sense of control.

1.2 Mental Stimulation

The second category of evidence within this integrated finding was that of mental stimulation. Three studies (**8**, **12** & **13**) contributed to this category of evidence, with the technologies relating to gaming (**13**), access to television (**12**) and prison radio (**8**) respectively. The technologies provided cognitive stimulation which helped prisoners to manage the routine of prison life. This comment from a prisoner who was part of Knight's (2012) study highlights the benefit that they perceived of access to television on their mental state:

> I've watched one documentary on one channel, switched it over, Panorama's on, switched it over, Dispatches is on. That's a great night for me, it's like going to a club. Do you understand what I'm saying? (Joshua, prisoner, p217)

The prisoner describes the stimulation that the television provides, resulting in a positive way to spend their evening despite the setting. Similarly, Ribbens and Malliet (2014) (**13**), found prisoners involved in a think aloud process while playing games, in addition to participating in interviews, reported that access to gaming provided mental challenge and helped them to maintain their mental abilities.

Prisons aim to provide a supportive and rehabilitative environment. The success of this aim is often challenged by routines that are deprived of stimulation, limited resources and through removing control from the person. Sykes (1958) describes the deprivations of imprisonment, such as lack of access to goods and services, relationships, autonomy, and security creating a challenging environment in which to live. The studies reviewed indicate that the introduction of technologies, particularly those which enable transactional process to be completed by prisoners and which provide mental stimulation, increase the potential of prisons to be more empowering and stimulating environments for those living within them.

2. Technology Helps People to Manage Time

The defining aspect of a person's prison sentence when awarded is the length of time that the person will serve. The objective of most people entering prison is then to manage their sentence through to the point at which they can leave. This objective is made more challenging in an environment which can lack activities or key events to look forward to. Time appears to be experienced differently within a prison environment relative to outside prison (Cohen & Taylor, 1972). The evidence for this finding, that technology can assist with managing this mental challenge of getting through a sentence, came from six of the studies. The evidence was separated into three categories: passing of time, solitude, and structure.

2.1 Passes Time

Five of the studies (**3**, **8**, **10**, **12** & **13**) referred to the assistance of technology in passing time in prison. The technologies involved (radio (**8** & **10**) television (**12**), video visits (**3**) and gaming (**13**)) were described as alleviating boredom and providing escapism, each of which enabled time to pass. It should be noted that the same effect in a community setting, to pass time, might not always be considered a positive attribute. However, the mental struggle with managing long periods locked in a small room provides a different set of demands and problems to be overcome. The impact of

technology on alleviating boredom is seen in a quote from a participant in a study (**12**) exploring access to television within prison:

> Boredom is poisonous, it is mental poison. You can easily get distressed and suicidal in here. TV keeps you occupied. Even just changing the channels using the remote, it keeps you focused. (Leon, prisoner; Knight, 2012, p198)

Access to a television was used as a tool to pass the time in prison which might otherwise have led to negative emotions. Similarly, Bonini and Perrotta (2007) interviewed prisoners about their use of radio in prison. Prisoners explained that radio listening made them feel that time was accelerated and that their sentence end was approaching more quickly. Through engagement with the various technologies, prisoners were occupied in activities, which provided them with a tool to assist in passing time.

2.2 Solitude and Privacy

The second factor within this integrated finding was that of providing an opportunity for privacy and solitude. Prisons hold large numbers of people in small, confined spaces. Even when a person has a cell to themselves, there will generally be a degree of noise from neighbouring cells to intrude on solitude or personal space. Four of the studies (**6**, **8**, **11** & **12**) noted that the technologies studied (computers (**6**), phones (**6**), television (**11** & **12**) and radio (**8** & **11**)) provided a sense of privacy. The opportunity to be absorbed in a television programme and to escape into the content broadcast provides a form of privacy for the prisoner. Similarly, in Bonini and Perrotta's (2007) study of prisoner radio use, one of the study participants described how listening to the radio "allows you to isolate yourself, and to escape, into the speaker's world" (p188). As with television, radio offers the prisoners a way to become absorbed in the content in a way that provides solitude. In Palmer et al.'s (2020) study, prisoners who had access to a telephone within their prison cell reported greater levels of privacy than prisoners at comparator prisons. In this case, it is the positioning of the

technology, which is of key significance, with feelings of privacy being greater when making a call within a cell relative to using a telephone on the wing.

2.3 Providing Structure

The final category for this finding was that of structure. While there are elements of a prison day which are consistent and reliable (such as unlocking times and meals), an issue of concern for prisoners is how to structure what can be long hours between these events (Cohen & Taylor, 1972). Two studies (**8** & **12**) described how radio and television can help prisoners to structure their days by planning when they will engage with particular programmes. Bonini and Perrotta (2007) explore the way that radio is used and experienced by prisoners in a Spanish jail. They note the effect of the "dailiness" of radio within the prison environment, that is, the everyday and routine nature of radio programming and its integration into prison life:

> If the habit of programming is one of the main modalities by which those who live in prison face their days, radio enters this predictable game and dictates the fashion of the day, significantly contributing to "make time flow." (p190)

The evidence from the studies suggests that technology appears to have a promising impact on people's perceptions of time, and their ability to find solitude within a densely occupied space.

3. Technology Leads to Changes in the Thoughts, Feelings and Behaviours of People in Prison

One of the objectives of the prison environment is to bring about changes in thinking and behaviour of those living there, with the aim of reducing reoffending (HM Prison and Probation Service, 2022). A consistent finding across evaluations of interventions with people who have committed crime, is that programmes which target attitudes, cognitions, and social skills are the most likely to influence further reoffending (McGuire, 2013). Perhaps unsurprisingly, all 13 studies explored the impact of technology on one or more of the thoughts, feelings, and behaviours of those engaging with it, as a proxy indicator of the relationship with future offending.

3.1 Changes to Emotions

The most observed outcome that the studies noted an influence on was that of emotions. Nine of the thirteen studies (**1**, **3**, **6**, **7**, **8** ,**9**, **10**, **12**, **13**) noted that the technology studied television (**12**), computer games (**13**), radio (**7**, **8**, **9**, **10**), podcasts (**9**), telephone (**1**, **6**) and video visits (**3**) had an influence on the user's emotional state. This included positive emotions such as soothing and gratitude, as well as nostalgia linked to the evocation of memories. Chan et al. (2019) interviewed 16 prisoners, held at a prison in Singapore, who had been provided with podcasts to listen to via tablets. One of the findings was that prisoners reported a positive effect on their mood, particularly following music being included on the podcasts. In Ribbens and Malliet (2014), prisoners reported the effect of playing computer games on their emotions. In this study, a prisoner who the authors named Christian, commented that:

> Someone might have said something to me, insulted me. I would be in my cell, unable to calm down and still pumped up with adrenaline. I could watch a television programme, but I would hardly be able to follow the subject. But if I would place a disc in my PS2, aaah, I would make some mistakes but still, I would become more and more deeply immersed in the game and, after half an hour, this would have calmed me down. (p13)

The prisoner is observing the effect that immersion in the game can have on his emotions, and his knowledge of this effect enables him to use the computer game as a way of moderating his reactions to events. While this example relates specifically to game use, the overall finding, that technology related to changes in emotions, was observed across types of technology. The observation was noted for a range of technology types, including communication technology, such as telephones and video visits, as well as entertainment technology such as games and television.

3.2 Thinking and Attitudes

Spending time in prison may link to changes to a person's thoughts and attitudes. As with any investigation of an intervention, it is hard to isolate the impact of the introduction of a technology on these phenomena. They may be simultaneously influenced by a variety of other areas, such as access to education, treatment opportunities, relationships with staff, support outside prison, and other factors (Social Exclusion Unit, 2002). Despite this a number of studies reviewed found that the technologies studied were related to changes in thinking and attitudes. Chan et al. (2019) noted the relationship between technology (the introduction of motivational podcasts) and prisoners' reflective thinking. This study reports prisoners who had engaged with the technology reporting adjustments to the way that they viewed their sentence, and their intended behaviour on release. For example, prisoners described learning moral lessons (such as needing to work for things that they want) and finding that the content of the podcast helped them to focus during the day. Similarly, participants in Bonini and Perrotta's (2007) study observed that listening to the radio provides a private listening experience, through which thoughts about family and friends occurred. One participant in their study, commented on how songs had a powerful effect on his process of reflection:

> You think, you find a song that reminds you of something, an episode, and you travel, you think about an episode of your life before this thing here, and this makes you think, it reminds you of memories, you think a bit … then in fact you stop right away otherwise your head goes away. (Claudio, p189)

Murdoch and King (2020) surveyed users of a scheme by which prisoners could participate in video visits with friends and family. One of the questions asked related to attitudes towards future offending: "Being able to have video visitations with my friends and family has made me want to improve my behaviour when I am released from jail" (p220). 37% of participants in the study gave

responses indicating that they agreed with this statement, this is a substantial proportion, given that other factors may also influence attitudes to future offending.

3.3 Behaviour Change

Eight of the studies (**2**, **3**, **4**, **6**, **9**, **10**, **11** & **12**) demonstrated that technology led to a change in prisoner behaviour. The behaviour measured varied from changes in custodial behaviour to changes in likelihood of reoffending after release, both of which were examined in McDougall et al. (2017). Their study explored the introduction of kiosks (wing-based computers[7]) in prisons. They found a statistically significant reduction in the level of adjudications following the installation of kiosks in addition to a statistically significant reduction in rates of reoffending. The same study also found that the custodial impact decreased after a period of 2 years post installation, indicating that outcome measures should be taken at a follow up point as well as after a recent introduction of the technology. Palmer et al. (2020), exploring in-cell telephones, wing-based computers, and in-cell computers, did not find a relationship with adjudications or rates of prisoner self-harm, though staff interviewed reported that use of illicit mobile phone use was likely to have reduced. Duwe and McNeeley (2021), and Murdoch and King (2020) both explored the use of video visits by prisoners and their families in prisons in the United States of America. They both reported positive effects on behaviour following release from prison. These integrated findings reveal that technology use of a variety of types can be linked to positive behaviour changes both inside and outside prison.

4. Technology Builds a Bridge to the Outside World and Connects People Inside

Life lived in prison is separated from life outside prison, this is both a physical separation and a psychological separation from the outside community. It is known that maintaining and developing connections with people outside of prison can be a protective factor against reoffending on release

[7] Computers placed in a shared space within a prison unit, which are open to all prisoners living on the prison unit.

from prison (De Claire, 2012). Ten of the studies (**1**, **2**, **3**, **6**, **7**, **8**, **9**, **10**, **12** & **13**) identified that technology was linked to the maintenance of relationships.

4.1 Connections to Outside

Some of the studies referred to improved relationships with people outside prison, perhaps not surprisingly, these included phone access and video visits (**1**, **2** ,**3** & **6**), which are designed to allow contact with friends and family. In addition to these technologies however, other studies found indirect links between technology and connections to outside prison. Chan et al. (2019) for example, reported that podcasts motivated prisoners to improve their relationships with family, while radio and television consumption (Anderson & Bedford, 2017; Knight, 2012) provided a shared topic for conversations with those outside prison.

Enabling contact with the outside world in a way that does not present risks to escape, or security is a key benefit of technology. Since prisons were introduced, there has remained a balance between keeping the people who are detained confined within the walls while enabling contact with people outside prisons. In more recent times, there is growing recognition of the value of maintaining relationships in connection with reduced reoffending (De Claire, 2012; Social exclusion unit, 2002). The installation of telephones within prison cells and the introduction of video visits are developments which support connections with family and friends. This systematic review has highlighted that other technologies can also assist in promoting these connections in an indirect manner.

4.2 Relationships Inside

In addition to supporting connections with the outside world, there was also evidence for technology improving relationships and connections between those living in prisons. Churcher (2008) studied prisoner led radio and television stations across a large prison in the United States of America for long term prisoners. One of the comments from a prisoner, named Goldie in the

research paper, working within radio production, illustrated the influence of the station on the sense of community:

> It's a means of having something that they can identify with as being theirs. It's not mine, it's not the other brothers' who work here. Warden Cain is over everything, but to the prisoners, this is their station. This is something they can identify with. For example, they write letters, they have favourite deejays, they write a letter saying would you all play this song? To hear their name called over the radio, they say "Man, you called my name!". (p166)

The radio enables the prisoners to hear from people that they can identify with and to feel a sense of belonging within the prison.

The value of developing and encouraging positive relationships within prison is recognised by a number of initiatives within prison such as those of rehabilitative culture (Mann, 2019) and Enabling Environments (Bennett & Tilt, 2019). This is further supported by research in custodial and community settings finding that social identification, that is identification with other members of a group, can increase feelings of satisfaction and meaning making while decreasing experience of stress. As a result of the positive effects observed, social identification has also been referred to as a 'social cure' (Haslam et al., 2005; Kellezi et al., 2018). This review finds that technological innovations have the potential to contribute positively to the development of positive cultures and communities, providing the effect of a social cure for the psychological challenges of a prison sentence.

5. Expectations of Technology, and Frustration When it Lets Us Down

Data for this finding came from seven of the identified studies (**1**, **2**, **3**, **5**, **6, 11** & **12)**. The technology explored in these studies were telephone use (**1**), video visits (**2** & **3**), wing based computers (**6**), in-cell computers (**6**), touchscreen computers through which meals could be ordered (**5**), television and radio (**11**) and television (**12**). These studies all reported a negative aspect of the technology implementation being thwarted expectations. That is, people expected that the

technology would be available and would work, when this was not the case, people reported feeling frustration. There were two categories of evidence which led to this finding: access and technology failures.

5.1 Access to Technology

This category related to situations where a technology was introduced, to which some prisoners did not have access, and drew on evidence from studies involving telephones, video visits, television, and radio. In Booth (2020) access to telephones was limited by the number of opportunities that prisoners were given to use the technology each week, this depended on the behavioural privileges that they had earned. Financial pressures also influenced access, Murdoch and King (2020) and also Booth (2020) reported that the cost of accessing telephone calls and video visits had the effect of limiting prisoner access to the technologies. These access difficulties, in addition to other technological challenges are illustrated by Duwe and McNeeley (2021), reporting a quantitative study of the effect of receiving a video visit on reoffending in the United States of America. While they found positive effects on some types of reoffending, only 4% of the prisoners released during the studied period (2016 to 2018) used a video visit, suggesting that there were barriers to access. The authors reported anecdotal evidence through their contact with prison staff which might explain this:

> First, technological difficulties were relatively commonplace, resulting in what may have been a poor user experience. Second, the vendor's software, which was not compatible with most smartphones and tablets, essentially required visitors to use laptop computers, which may have been a barrier for some potential visitors. Third, even though a video visit would generally be less costly than an in-person visit for many, the cost (about $10 for a 30-minute visit) may still be too much to bear for some potential visitors. (p18)

While the first four integrated findings illustrate the positive potential of technologies in prison, barriers to access such as cost, or availability led to a lack of equality across prisoner groups and feelings of disappointment and frustration.

5.2 Technology Failures

The second category was that of technology failures. Kenis et al. (2010) reported a study of in-cell devices in a prison in the Netherlands. This study found that increased staff time was required to manage the devices when they broke down. Staff time was further used to manage the subsequent frustration of the prisoners that resulted from the breakdowns. Palmer et al. (2020), studying computers and telephones in prisons, highlighted the importance of prisons having effective back-up processes for situations when technology stops working, to avoid significant disruption occurring in the event of an outage. An extract from Palmer et al. (2020) highlights the concerns and disruption which arose when the technology stopped working:

> As soon as cell phones down, bam, chaos on the wing, "Boss, my phones aren't working. Boss, boss, boss, boss, boss" and then obviously you got to fix it, and then when you say, "Oh, god, it's got to be someone from [the contractor] and it's coming in two weeks". (Prison Officer, p23)

The comment above illustrates the stress felt by the staff member at managing a situation where the phones are not available for prisoners to use. The responsibility for fixing the issue is felt by the staff member, though the ability to resolve the problem relies on the contractor. Although occasional breakdown of technology might be predictable, this did not appear to be in the expectation of users, hence leading to frustration with the technology.

Conclusions

Advancements in technology have led to an increase in the breadth and sophistication of technology within prisons over recent decades. The aim of this review was to systematically explore

the available literature on technology innovations to develop prison environments. It further aimed to aggregate the qualitative, quantitative, and mixed methods evidence to understand how technological infrastructure innovations in prisons affect the psychosocial experience of those living or working in them. The research base evidencing the consequences of the introduction of technology and how it relates to the experiences of people in prisons is relatively small, this review assists policy and decision makers in this field by synthesising the available evidence into useable guidance.

This review has been carried out at a significant point in the trajectory of technology within prisons. The advance of technology use in day-to-day life in the community has expanded at pace since the introduction of mobile phone and handheld technology. A linked but lagged effect was always likely to follow within prisons in a similar manner to the linked but lagged introduction of landline phones, radios, and television into prisons. The pace of technological advancement in prisons was increased during the COVID-19 global pandemic, in which the benefits of operating at a distance and the need to create efficiencies were a focus. The findings of the review support the further roll out of technology within prisons.

To avoid repetition across the chapters, limitations and strengths of this study, as well as implications for policy, and future recommended research will be considered in the thesis discussion, in Chapter 5. Of specific relevance to the current chapter, the discussion includes consideration of how researcher influence may have contributed to the results.

Chapter 3

Study 2- Exploring the Relationship Between Use of Computers in Prison and Rehabilitation

Chapter 2 explored technological innovations in prisons. This chapter describes a novel study which seeks to expand knowledge on a specific technological innovation in prisons, personal computers within prison cells. In 2021, HM Prison and Probation Service (HMPPS) published a digital, data and technology strategy, which included the commitment to "give people in our care the digital tools and technology to support their rehabilitation" (HM Prison and Probation Service, 2021). Specifically, nine closed prisons were to receive tablets or computers within prison cells with the aim of enabling prisoners to maintain relationships and to support rehabilitation. Provision of computers in prison cells is a relatively recent innovation and there is little research to date exploring if the provision of computers in cells achieves these aims. This study aims to explore if providing computers in cells achieves their intended function of improving prisoner relationships and supporting rehabilitation. This will provide a foundation to the literature on personal computers in prisons and inform policy relating to investment in this area.

Rehabilitation in Prisons

Rehabilitation, referring to the process by which an individual moves away from crime or anti-social behaviour, has been widely discussed amongst psychologists and criminologists. Commonly adopted rehabilitation models for developing services and interventions include the Risk Need Responsivity (RNR) model (Andrews & Bonta, 2010) and the Good Lives model (Ward, 2002). The former encourages focus on the empirically supported factors of individual's level of risk, individual's level of need, and being responsive to the individual in the design and delivery of interventions. The Good Lives Model (Ward, 2002), while compatible with the RNR encourages a focus on an individual's strengths, building on a person's internal resources to reduce risk. The RNR and the Good Lives Model offer guidance for programme or intervention designers to develop rehabilitative approaches. Alongside these intervention approaches, the process of desistance, that

is, how individuals move away from an offending pathway has been studied (Laub & Sampson, 2001; Maruna, 2001). In contrast to the RNR (Andrews & Bonta, 2010) and the Good Lives Model (Ward, 2002), a desistance framework describes how change might occur without intervention, highlighting conditions and opportunities that make this more likely. For example, Bottoms et al. (2004) suggest that desistance is supported through the individual's environment, such as access to accommodation and employment, and an individual's experience of their own agency. While there is empirical support for each of the models above, the desistance framework is of particular relevance to the introduction of technology in prisons, as this is not a direct intervention to reduce risk, but rather an environmental adjustment which could have the capacity to support an individual to desist from crime.

There is not a single agreed process through which desistance from crime takes place (Rocque & Posick, 2021). Fox (2022) summarises current theories of drivers for desistance into three areas. Firstly, internal drivers, such as changes in cognitions which may lead to new expressions of identity. Secondly, external drivers, such as attaining stable employment which may lead to increased security and reduce the drive to offend. Finally, a combination of external and internal drivers, that is, external drivers may influence internal cognitions, for example, the support and trust of a valued group of people may influence cognitions towards a desistance mindset. Chouhy et al. (2020) recognise internal and external pathways to desistance, but also emphasise the relevance of social support in some form across many pathways. Kay (2022) highlights the importance of distinguishing between pro and anti-social capital in the types of social support received, in relation to whether people are likely to move towards or away from a desistance lifestyle. Goodwin (2022) describes the importance of "keeping busy" for women who are at the early stages of desistance. While there is variation within the routes to desistance, common features noted in those who desist from crime across studies include feelings of agency, receipt of social support (from professionals in the justice system and from friends or family), and coping skills to manage challenges and emotional difficulties (Cid & Marti, 2017; Hall & Chong, 2018; Maruna, 2001; Laub & Sampson, 2001). These

areas provide targets for the criminal justice system to shape its services to support people away from crime, through offender management processes following desistance principles (McNeil, 2006).

In addition to models of rehabilitation and desistance, focus has increasingly been placed on the climate or environment of a prison. Climates that support rehabilitation, and which are experienced as procedurally just, provide a safer base from which an individual can attend to the other factors involved in desistance from offending (Day et al., 2012). Measures or indicators of a safe, supportive, rehabilitative climate divide into direct assessments, which survey those living or working in the environment (Tonkin, 2016) and indirect measures, such as measures of self-harm and violence (Moran et al., 2022). Where a prison climate is experienced as positive, outcomes for prisoners released from this environment are more positive (Auty & Liebling, 2020; Beijersbergen et al., 2016).

Technology and Rehabilitation

In relation to the aim of the current study, to understand if computers in prison improve relationships and rehabilitation, there is tentative support from existing literature that such an impact may be likely, as observed through relevant behavioural and psychological changes.

Behavioural Changes

Evidence for the impact of computers on prison indiscipline and reoffending rates was shown by McDougall et al. (2017). Using a natural stepped wedge design, McDougall et al. (2017) compared rates of prison indiscipline before and following the introduction of wing-based computers in 13 privately operated prisons. They found a significant reduction in rates of prison indiscipline after computers had been installed (the period measured was between 2007 and 2014). Reduced rates of reoffending were also found when prisons with the wing-based computers were compared to matched prisons without such technology. This study provides valuable insight into the potential impact of technology in prison on prisoner behaviour, however research gaps remain due

to the type of technology and prisons included in the study. The technology being implemented in the prisons in McDougall et al.'s (2017) study were shared computers in a public space on a prison wing. Personally allocated computers, have a higher degree of privacy and provide increased frequency of opportunity for access. Further research is needed in this area to understand if the positive findings in relation to wing based computers extend to, and potentially are further enhanced by, access to a personal computer. A weakness of the McDougall et al. (2017) study was that the rates of reoffending and indiscipline changes could have been affected by other co-occurring variance at the prison rather than the introduction of the technology. Further research, involving designs which explore change and computer use at an individual level compared to at a whole prison level would inform if the positive changes observed are likely to be the result of computer access. The prisons involved in McDougall et al.'s (2017) study were privately run prisons; these operate with differences to public sector prisons. Research within public sector prisons in England and Wales is needed to understand if the same results are seen across public and private sector prisons.

Psychological Changes

In addition to the above study exploring behavioural changes, recent studies have explored psychological changes for people in prison where technology has been introduced. For example, Palmer et al. (2020) used surveys and interviews with staff and prisoners to explore the outcomes of the introduction of four technologies into seven prisons in England and Wales. The technologies studied were in-cell telephones, handheld devices for staff, in-cell computers, and wing-based computers. Staff and prisoners self-reported positive changes to wellbeing and agency as a result of the technologies. The study design did not involve a comparison group and the data gathered was self-reported. Furthermore, only one of the seven prisons had in-cell computers, and therefore the findings are more relevant to understanding the impact of other technologies rather than in-cell computers.

The studies described above involved wing based computers or collected limited data from prisons with computers in prison cells. In contrast, two studies conducted in Australia in 2022, involved the use of technology allocated to individual prisoners and used within the prison cell. The first of these, Barkworth et al. (2022), explored the relationships between quality and quantity of prisoner use of digital tablets, and the psychological variables, wellbeing, autonomy, and social climate. Tablets were allocated to prisoners during overnight periods within two Australian prisons. The tablets were enabled for phone calls, messaging to prison departments, emails to friends and family and access to information relating to the prison. Quantity of computer use was measured through 208 prisoners self-reporting their frequency and length of use. Quality of use was measured through two survey questions, the first asking if the tablets had improved connections with friends and family, and the second asking if the tablets had improved experience of prison life. The study showed a positive relationship between prisoners' self-reported views of the impact of tablets on connections with friends and family, and measures of autonomy, and wellbeing. A positive relationship was also shown between tablets improving experience of prison life and social climate. Negative relationships were shown between quantity of tablet use and the measures for social climate, wellbeing, and autonomy. Barkworth et al. (2022) suggested that the negative relationship between quantity of use and the measured psychological variables may be due to the difference between active and passive use, following community evidence that passive computer use is associated with anxiety and depression (Escobar-Viera et al., 2018). The tablets allocated to prisoners in Barkworth et al. (2022) allowed prisoners to make phone calls, send emails and provided a limited entertainment content. This is a more limited functionality than that available via the computers within HMPPS, where transactional tasks are enabled such as the ability to manage finances, to carry out shopping tasks, and to view their personal activity timetable. Such functionality provides prisoners with the ability to directly manage aspects of their lives which otherwise require support from a member of prison staff. Further research is required to understand

if the addition of this transactional functionality changes the psychological outcomes for prisoners, for example, increased feelings of control or agency.

In a follow up study, with the same two Australian prisons, Thaler et al. (2022) interviewed 20 prisoners with access to the tablets, to explore their use of the tablets and their views on the impact on their lives in prison. At the point of this study, the functionality of the tablets had increased to include the ability to check financial balances and to purchase items via the tablets. The data was analysed using a framework matrix approach, to explore the perspective of prisoners against areas of research interest. The study found that the tablets were used regularly by prisoners, and further that the prisoners reported the tablets to have a positive impact on their relationships outside and inside the prison. They also reported positive effects on their emotional state during their sentence (reducing stress and increasing autonomy), and the tablets appeared to encourage use of technology for those who had not previously used it.

Finally, Robberechts and Beyens (2020) reported an ethnographic study, involving 63 interviews with prisoners and prison staff, from a Belgian prison with an in-cell computer system. The computers were allocated to each prisoner, and enabled access to information relevant to day-to-day life in the prison, communication with others inside and outside prison, and entertainment features such as videos and games. The study found that the computers improved connections to others inside and outside of prison, and prisoners felt less dependent on prison staff to manage their daily lives. They also noted some risks of the new system, namely that prisoners were responsible for an increasing number of decisions, and that while communication to other parts of the prison were digital, the system still relied on a person at the end of the message to provide a response. The full thesis reporting the study (Robberechts, 2022) is under embargo at the time of writing.

The recent studies by Barkworth et al. (2022), Thaler et al. (2022) and Robberechts (2022), in Australia and Belgium respectively, contribute to the nascent knowledge base on psychological outcomes hypothesized to be linked to computer access, such as agency, connection and wellbeing.

There remain some research gaps relating to the specific technology of personal computers within the United Kingdom.

Theory of Positive Technology and Rehabilitation

Since the invention of the first programmable computer in 1936 (Computer Hope, 2023), computer availability and use has increased at pace, to the situation where in 2023 there are over two billion computers worldwide and over six billion smartphone users (Windows Report, 2023). While the range of positive and negative changes that have been brought about by computers within society is beyond the scope of this introduction, theories of computer impact in the wider community can inform the potential impacts of technology use in prisons.

One theory is that of Positive Technology (Riva et al., 2014), an adaptation from the theory of Positive Psychology (Seligman & Csikszentmihalyi, 2000) which focuses on aspects of the human experience that lead to flourishing rather than a focus on pathology. Positive Technology theory suggests that technology use can increase wellbeing through three mechanisms, each of which has parallels within Positive Psychology. The first of these mechanisms is that of a hedonic effect, that is, technology use has the potential to affect emotions and therefore to induce a positive experience. Suggested examples (Riva et al., 2014) of how this might operate through technology are immersive computer use, with an effect akin to meditation leading to relaxation. The second mechanism is that of a eudaemonic effect, that is, that personal resources and the ability to action these are adequate to meet the challenges that a person is faced with. Suggested technology use that might act on this level are tasks that facilitate transactional processes, such as making purchases or managing bank accounts. Finally, the third level of positive technology theory is that of connection, recognising the value of enabling social connection and the impact that this can have on wellbeing. Types of technology use that might achieve this level are those that facilitate relationships between individuals, for example, through text messages or video calls.

Technology within prisons has the potential to provide a desistance enabling environment through pathways that include increasing agency, relationships, and emotional management. The theory of Positive Technology (Riva et al., 2014) which highlights how technology might affect users' emotions, their engagement, and connections with others provides a theoretical pathway by which computers in prison cells might support desistance from crime.

A Brief History of Technology in HMPPS

Technology for Communication

In order to achieve their primary function of keeping people in custody, prisons necessarily involve restriction of movement and restriction of access to specific items that could be used for the purposes of disorder or for escape. Communication devices such as telephones are one such item which are controlled, to manage the risk of disorder or escape. Prior to the introduction of phonecards in the 1980s, communication between people in prison and their friends and families (aside from occasional visits) was largely through letters in the postal system. This progressed to real time communication when telephones were introduced onto wings in 1987. Since 2016, installation of landline phones to prison cells in England and Wales has been in the process of rolling out across the estate (and is not complete at the time of writing). By 2023, a small number (16 out of 103 public sector prisons at the time of writing) of prisons had introduced computers within prison cells, the functionality of which is described in Chapter 1, with the ability to email friends and family and to message departments within the prison.

Technology for Transactional Tasks

In UK prisons without computers in cells, there are a range of daily functions which require workers (often prison officers) in prisons to assist prisoners to access services. Examples include distributing and collecting paper forms to indicate meal preferences or shopping requests, checking, and communicating account balances, passing paper forms between departments, and distributing

incoming mail. Prisoners are to a high extent reliant on prison workers to achieve their day-to-day functional tasks and the performance of these tasks can be impacted by competing pressures on this staff group. Where prisoners have access to computers in their cells these tasks can be carried out via the computer at a time of their choice, without the need for a staff member to help. The shift of responsibility for completing these tasks from prison staff to prisoner has the potential to reduce workload for prison staff, and increase psychological outcomes of control, agency, and autonomy for prisoners.

Technology for Entertainment

Prior to 1995, media entertainment within prison cells was limited to reading books or newspapers. In 1995 televisions were introduced to prison cells (Knight, 2005), providing an alternative method of spending time and a commonality with life outside prison. The installation of personal computers, with access to games and video content, to some prisons in HMPPS, provides a further option for using time while in a prison cell. Increased options for entertainment have the potential to assist prisoners to manage mental health challenges through distraction. There is also evidence from community settings that interaction with video games can lead to cognitive benefits (Reynaldo et al., 2021).

Anticipated Effects of Introducing Computers to Prison Cells

As described in the section on Technology and Rehabilitation, there is limited but promising evidence that providing prisoners with access to computers has behavioural (improved custodial behaviour and reduced reoffending) and psychological (improved agency, autonomy, and emotional benefits) outcomes. This study sought to understand the psychological processes through which these changes were operating. It began by identifying two indicators of an improved rehabilitative outcome for people in prison, those of increased wellbeing and increased agency for desistance. The following sections describe each of these two indicators, outlining the link to pro-social outcomes for

people in prison. The sections also propose the psychological pathways through which functions on the computers might lead to increases in wellbeing and agency for desistance.

Wellbeing

If prisons are to be places where people change their life pathway towards desistance it is recognised that attention is needed in the design of the environment. The concept of a rehabilitative culture for prisons depicts a triangular structure of needs, with the base layer being safety and decency (Mann et al., 2018). This recognises that for prisoners to attend to factors further up the triangle, such as substance use and changing attitudes and thinking, a state of safety and wellbeing is first needed.

Wellbeing of people in prison is below that of the general population. In a study screening 469 prisoners from 13 English prisons, Tyler et al. (2019) found disproportionately higher levels of mental health problems among people in prison when compared with the general population. Suicide rates for people in prison between 2008 and 2019 were 3.9 times higher for people in prison than for the general population (Office for National Statistics, 2023). A rapid evidence review of interventions in prison for wellbeing, found promising evidence for the potential of some approaches to improve wellbeing (Scottish Government, 2022).

Based on the previous literature, this study proposes three broad pathways through which in-cell computers may impact on wellbeing. Firstly, the entertainment, games and content included on a computer within cells may provide an additional avenue to increase prisoner wellbeing through occupying time. This is similar to the outcomes identified following the introduction of television to prison cells (Knight, 2012). This pathway can be considered as involving the development of coping skills. Secondly, an increase in perceived afforded choice and autonomy satisfaction has been demonstrated to be related to quality of life in prison (van der Kaap-Deeder et al., 2017) and this may be enabled through the transactional aspects of an in-cell computer, such as managing finances and buying items. This pathway can be described as self-governing skills. Thirdly, the increased

connectedness that the computers provide allows increased social interaction with others. The current study will explore these pathways as illustrated in Figure 3.1.

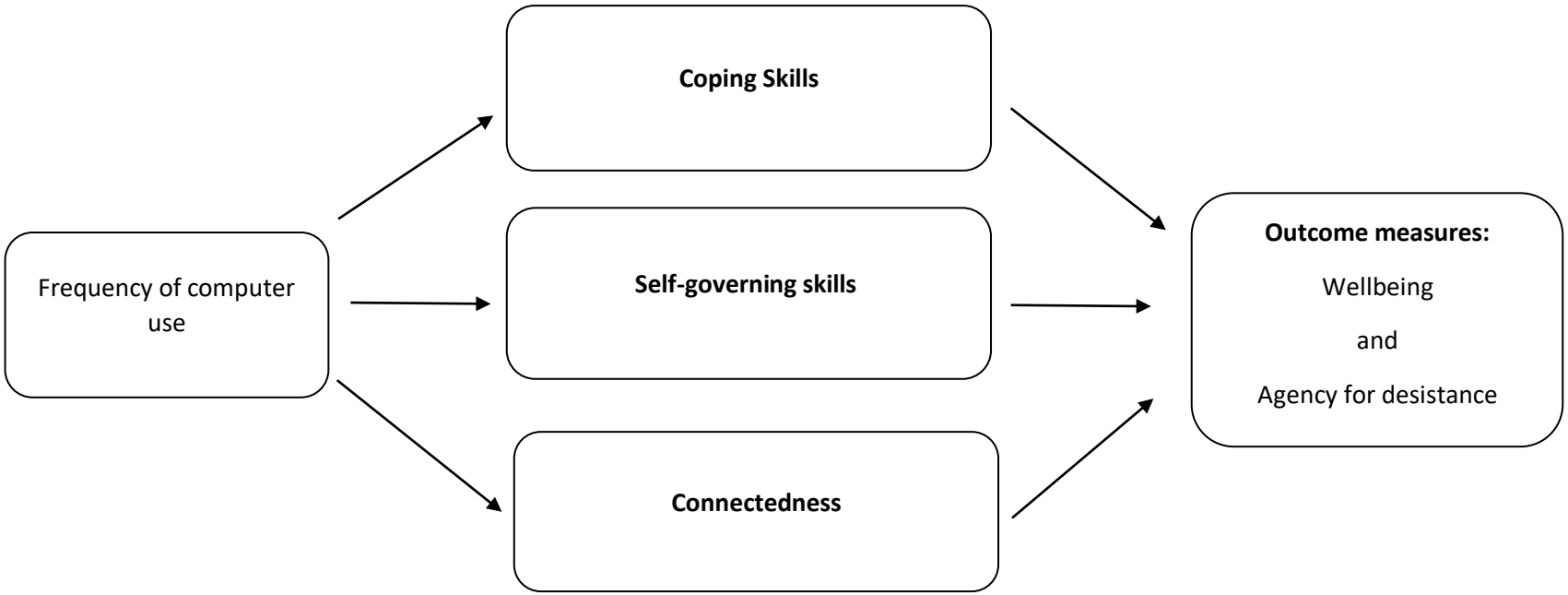
Agency for Desistance

The second indicator of rehabilitation that will be used in the current study is that of agency for desistance. This relates to individual prisoners' beliefs that they can follow a new pathway on release from prison that will prevent them from returning to crime. This is consistent with Maruna's (2001) finding that people who successfully desisted from crime had a plan that they were optimistic they could fulfil.

As described in the section Rehabilitation in Prisons, there is not one agreed process through which desistance occurs, however, common suggested pathways include increasing agency and autonomy, social support from others and coping skills. The potential for these pathways to be supported through the allocation of an in-cell computer can be linked to the various functions of the computers. Firstly, the pathway of agency and autonomy may be supported through the transactional functions of the computers, such as checking the amount of money held, ordering meals, viewing the timetable, and shopping. These functions allow prisoners to take control of day-to-day aspects of their lives, in prisons without computers, these tasks would require support from a member of prison staff. The second pathway involving connection and the development of social capital, could be supported through the function allowing prisoners to email friends and family and to contact other departments in the prison. Finally, the pathway involving increased coping and resilience may be supported through access to informative content and the entertainment functions of the computers. The current study will explore the relationship between use of the computers and agency for desistance, including an exploration of whether these three pathways carry an indirect path between the predictor and outcome variables, as illustrated in Figure 3.1.

Figure 3.1

Proposed Model of Computer Use Acting on Wellbeing and Agency for Desistance



The Current Study

While there is promising evidence that technology in prison can be a rehabilitative addition to prisons, to date, the studies have not addressed whether the allocations of personal computers to prisoners in HMPPS meets the intended objective of improving rehabilitation. Previous studies have investigated a broad range of technologies, limiting the findings attributable to in-cell computers (McDougall et al., 2017; Palmer et al., 2020); have involved technologies without transactional functionality (Barkworth et al., 2022); or have involved prisons from a non-UK setting (Robberechts & Beyens, 2020; Thaler et al., 2022). The current study aims to explore whether the investment in computers in prison cells in England and Wales is achieving the intended purposes of supporting rehabilitation. This study will explore two outcomes, considered indicative of rehabilitation, those of prisoner wellbeing and agency for desistance. The study will further explore the mechanism by which any relationship exists through examining the mediating roles of variables in three categories, depicted in Figure 3.1.

Unlike the spread of internet use in the community which is driven by individuals choosing to purchase computers or smart phones to provide access, the decision to roll out computer use within prisons requires public investment and systems change. This study aims to contribute to the literature base in this area to support future policy decisions, in relation to investing in computers in prisons.

The main research question that the study set out to answer was:

What are the psychological outcomes associated with in-cell computer use?

Within this main research question, were the following research objectives:

1. Given the novelty of prisoner access to in-cell computers, to explore how prisoners use the in-cell computers and how they experience and evaluate living with an in-cell computer.

2. To explore how the use of in-cell computers is related to rehabilitation, through the outcome variables of wellbeing and agency for desistance.

3. To explore the psychological processes taking place within any relationships between computer use and wellbeing, and computer use and agency for desistance.

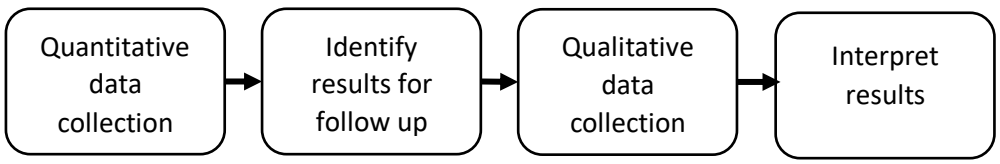
Method

Design

This study forms the first part of an explanatory sequential mixed method design (Creswell, 2017), comprising a study involving primarily quantitative data followed by a qualitative study, reported in Chapter 4. The findings across both studies are integrated in the discussion to Chapter 4 and the overall thesis discussion in Chapter 5. Mixed method research, capturing the advantages of qualitative and quantitative techniques to explore a research question, has an established position in research design (Creswell & Plano Clark, 2018). For the current thesis, this approach allowed the inclusion of a rich variety of data on a topic which has a limited literature base. A mixed method approach was also consistent with the researcher's philosophical position described in Chapter 1 of critical realism, collecting both qualitative and quantitative data to build the fullest picture possible of the underlying reality. The sequencing of collecting quantitative data followed by qualitative data, provided an opportunity to explain the findings of the first study through the addition of a different research perspective. The overall study design is depicted in Figure 3.2.

Figure 3.2

Diagram of Explanatory Sequential Mixed Methodology Design



This first study used a cross-sectional correlational design, using data gathered from a survey distributed via the in-cell computers. The predictor variable was the self-reported frequency of use of the in-cell computer (including specific types of use, such as for playing games, watching entertainment shows, shopping, checking financial account, and watching religious content). The outcome variables were wellbeing and agency for desistance. The potential mediating variables were growth, personal control, autonomy, perceived general support, perceived support from prison and trust of staff. Open text responses to questions relating to computer use were included in the survey, to inform understanding of how the computers were used, and what prisoners liked or disliked.

Study Context

In 2016, computers were introduced into prison cells in two prisons in England and Wales. Although further prisons have subsequently introduced in-cell computers, the initial two prisons were selected for the study, having had the longest opportunity for the computers to embed within the culture and operations of the prisons. Computers were allocated to each prisoner including where prisoners shared a cell, meaning each prisoner had the opportunity to access a computer during the period that they were in their cell. Both prisons were category C[8] level of security.

Participants

During the period that the survey was open, Prison One held 1820 prisoners and Prison Two held 865 prisoners, making a total of 2685 prisoners with whom the survey was shared across the two sites. All participants were adult males, over 18 years of age, living in prison. The participants included both remand and sentenced (convicted) men. Of the 2685 prisoners who were resident in the prisons at the time of the survey, 784 prisoners (29.2%) consented to participate and completed the survey.

[8] A categorisation which describes a closed prison in which prisoners are assessed as lower-level risk of escape than those held in categories A or B.

Demographic details of the participants are shown in Table 3.1. The mean age for participants aligned with the modal group for prisoners in England and Wales, 30-39 years old (Justice data, 2022). While there was a notable difference in ethnicity distribution between the two prisons, the proportion of participants for each prison was a reasonable match for the population of the prisoners at each site. For example, in December 2018 the percentage of prisoners who self-identified as white at Prison One was 83% and for Prison Two was 68% (Ministry of Justice, 2022a). The proportion of prisoners reporting as enhanced status on the behaviour rating scheme[9] was 86% at Prison Two in comparison with the current national average of 50.3% (Ministry of Justice, 2022b). The behavioural rating scheme was not in operation at the point of data collection at Prison One due to restrictions for the COVID pandemic, and this may also have been a factor in the higher proportion of prisoners on the enhanced level at Prison Two. Alternatively, it may be that a higher proportion of prisoners on the enhanced level of the scheme responded to the survey relative to those on standard or basic level. The background population figures for the rating scheme in Prison Two at the time of data collection were not available.

[9] HMPPS uses a behaviour management scheme, the Incentives and Enhanced Privileges scheme. Prisoners are rated as basic, standard, or enhanced, they can access different privileges dependent on their rating.

Table 3.1

Demographic Data for Study Participants

	Prison	Mean age (years)	Mean time spent in prison (months)	Mean time until release (months)	Level on behaviour rating scheme (%)	Ethnicity (%)
Prison 1	N= 546 (30 % return rate)	35.59	48.09	38.86	NA*	White = 89 Black = 2 Asian = 2 Mixed ethnicity = 5 Other = 1 Not stated = 0
Prison 2	N= 238 (27.5% return rate)	37.53	36.16	34.92	Enhanced = 86 Standard =11 Basic =3	White = 64 Black = 13 Asian = 11 Mixed ethnicity = 8 Other = 2 Not stated = 3

Note: Behaviour rating scheme not used at Prison One at point of survey.

Measures

A survey was created to measure the frequency that participants reported using the in-cell computers and the outcome and mediating variables described above. In selecting measures for the outcome and potential mediating variables the researcher followed a three-step process. The first step involved searching PsycTEST using key words involved in the concept, alongside the terms forensic or offender or prison. The second step was to refer back to articles and studies that were reviewed during the initial literature review and to identify any measures used within these articles to enable relevant comparison across studies. Finally, discussions were held with the researcher's supervisors to identify additional measures to consider which may be relevant to the current study but outside the researcher's knowledge. Measures obtained through all processes were then assessed against criteria of: number of items, validity, reliability, applicability to a forensic population, reading level required to complete, written in English, does the measure require the participants to be engaged in current treatment or intervention? A copy of the survey, combining

the measures below, is included in Appendix B. The final survey involved 14 items exploring recent use of the computer (predictor variable), 55 items to measure the outcome and potential mediating variables (from eight measures) and four free text questions.

Predictor Variable: Use of Computers

No pre-existing measures were identified through the above search process to assess computer use. Following discussion with the HMPPS digital team (the developers of the content for the HMPPS in-cell computers), consideration of the data available from google analytics, access to feedback from the in-cell computers (through comments that prisoners had left on the existing content) and through the researcher viewing the content of the in-cell computers, 17 questions were included in the survey to measure type and frequency of use of the computers. Initial questions on the survey collected information about age, length of sentence to date, time until earliest release and ethnicity. Participants were then asked to indicate their use of the computers in the two weeks prior to the current date, using a five-point scale (1=n*ever*, 2=*rarely*, 3=*sometimes*, 4=*often*, 5=*always*). These questions explored frequency of use of the computer, as well as frequency of use for the specific purposes of playing games; listening to the radio; commenting, liking or disliking content; watching factual content; watching entertainment content; content related to health; content related to religion; checking the amount of money in account; viewing a prison service order or instruction; shopping; and watching a video from a prison manager.

Outcome Variable 1: Wellbeing

Wellbeing was measured, with permission, using the seven-item short version of the Warwick Edinburgh mental wellbeing scale (Ng Fat et al., 2017). Participants responded on a five-point scale, (1=*none of the time*, 2=*rarely*, 3=*some of the time*, 4=*often*, 5=*all of the time*). Raw scores were converted to a metric scale as described by Stewart-Brown et al. (2007). High scores represented greater levels of wellbeing. An example item from the scale is “I’ve been feeling relaxed”.

Outcome Variable 2: Agency for Desistance

Agency for desistance was measured with Lloyd and Serin's (2012) ten-item Personal Agency for Desistance questionnaire. Participants responded on a five-point scale, (1=*strongly disagree* – 5 = *strongly agree*). High scores represented greater agency for desistance. Three items were reverse scored. An example item from the scale is "things have been bad for me in the past, but I can work to turn things around and live a crime-free life if I want to".

Mediating Variable Type 1: Coping Skills

This mediating variable was concerned with elements of the environment which were experienced as supportive and nurturing. The measure selected was the nine-item growth scale from van der Helm et al.'s (2011) Prison Group Climate Instrument (PGCI). Two minor adaptations were made to the questions for the current study: the term "group worker" was changed to "officer" and the words "in prison" were used to replace the word "here". Participants responded on a five-point scale, (1=*strongly disagree* - 5=*strongly agree*). High scores represented greater opportunity for growth within the climate. An example item from the scale is "I feel I am making progress at this prison".

Mediating Variable Type 2: Self-Governing Skills

Two aspects of self-governing skills were identified as potentially important from the literature review, autonomy and personal control. Two different measures were selected, one for autonomy and one for personal control.

Autonomy was measured using the four-item autonomy satisfaction scale and the four-item autonomy frustration scale from van der Kaap-Deeder et al.'s (2020) Basic Psychological Need Satisfaction and Frustration scale. Participants responded to the eight items on a five-point scale (1=*not at all true*, 2=*rarely true*, 3=*sometimes true*, 4=*often true*, 5=*completely true*). High scores

represented greater autonomy. Items from the autonomy frustration scale were reverse scored. An example item from the scale is “I feel a sense of choice and freedom in the things I undertake”.

Personal control was measured with Greenaway’s (2013) measure of personal control. Participants responded to the three items on a five-point scale (adapted from a seven-point scale for survey consistency), (1=*not at all true*, 2=*rarely true*, 3=*sometimes true*, 4=*often true*, 5=*completely true*). High scores represented greater personal control. An example item from the scale is “I feel in control of my life”.

Mediating Variable Type 3: Connectedness

Social connection with various others was identified as important through the literature review, and the study sought to explore which of these, if any, contributed to the outcome variables. For this reason, three different measures of connectedness were used, the first a measure of global support experienced, the second a measure of support experienced directly from prison staff, and the third a measure of trust placed in prison staff.

General support (to include family and friends outside prison) was measured with Haslam et al.’s (2005) measure of perceived general support. The four items used in the current study were adapted by Jetten et al. (2011) from an original ten item measure (Haslam et al., 2005). Items were rephrased from questions to statements to align with other measures in the survey. Participants responded to the four items on a five-point scale, (1=*not at all true*, 2=*rarely true*, 3=*sometimes true*, 4=*often true*, 5=*completely true*). High scores represented greater general perceived support. An example item from the scale is “I get the emotional support I need from other people”.

Quality of the relationships between staff and prisoners were measured with van der Helm et al.’s (2011) 12-item growth scale taken from the Prison Group Climate Instrument (PGCI). Participants responded on a five-point scale, (1=*strongly disagree* - 5=*strongly agree*). High scores represented higher levels of perceived support from the staff at the prison. An example item from the scale is “when I have a problem there is always someone I can turn to”.

Trust towards prison staff was measured using two items written for the survey, due to the search process not identifying a suitable published measure. Participants responded on a five-point scale, (1=*strongly disagree* - 5=*strongly agree*). High scores represented greater levels of trust towards staff. An example item is “I trust the officers at this prison”.

Free Text Questions

The free text questions were selected to address research question one (to explore what participants liked and disliked about the in-cell computers). Participants were asked: “what do you like about the computers?”, “what do you dislike about the computers?”, “how could the computers be improved?”, “what other purpose do you use the computers for?”.

Procedure

The survey was piloted to assess the suitability of Unilink software, survey software installed on the prison computers. The survey was offered to 20 men at the two prisons involved in the study, 10 at each site, by adding the survey to their software platform. The prisoners were those living in the first 10 cells on the list for a wing at each of the sites. The computer provides the prisoner with a notification to let them know that a survey is available for them to complete. The test survey was available for a period of two weeks at both sites initially. Six of the 20 prisoners offered the survey consented to take part and completed the survey.

The pilot demonstrated that the Unilink survey tool allowed the participants to access and complete the survey as intended. Minor changes were made to the survey following the pilot phase (these were to correct a small number of spelling errors and alterations to the settings of the survey to enable the data to be downloaded in a useable format).

Following the piloting process, the survey was placed on the computers of all remaining men at the two prisons for three weeks within January 2022 and February 2022. The survey was advertised in two ways:

1. Prisoners received a notification via their computer that they had a survey to complete.
2. The researcher recorded a brief video, describing the purpose of the research and explaining where the prisoners could find the survey on their computers. This was added to the news section of the computer interface at each of the sites. The script used for the video can be found in Appendix C.

Data was collated, via the survey tool, and exported as pdf documents for each participant (the survey tool at the prison sites was not enabled to collate the data as a comma separated values (csv) file). The data was then manually inputted to a csv file, removing any identifying information in the process.

Ethical Considerations

Approval

A research proposal was given favourable opinion by Nottingham Trent University Research Ethics Committee (25/01/21) and by HMPPS National Research Committee (17/11/20). The British Psychological Society code of Human Research Ethics (Oates et al., 2021) was adhered to throughout the study.

Participant Consent

When clicking on the survey, participants were directed to a notice to prisoners explaining the purpose of the survey and the advantages and disadvantages of participating in the study, a copy of this information can be found in Appendix D. Participants were asked to read the information and then to decide whether they consented to participate in the study. There was no financial incentive provided to complete the survey. Consent to participate was confirmed, or not, through the first question on the survey. Participants provided two pieces of personal information at the end of the survey, which could be used to identify their data, and were given details of how to request to withdraw from the study for up to a month after completion.

Data Management

Data was anonymised during data processing, and stored securely, with agreement to delete after a maximum of ten years. Participants were advised that identifiable information that indicated a risk of harm to self or others could be passed to the prison security department.

Results

Descriptive Statistics

The survey involved 14 questions relating to frequency of use of the computers, the results of these are displayed in Table 3.2. The most frequently reported uses of the computers (when the sum of the "often" and "always" responses for each type of use was compared) were to check their account balance,[10] play games, shop, and to check prison service policies. Of the types of use explored, prisoners were least likely to use the computer to access religious content.

Table 3.2

Self-Reported Type and Frequency of Use of In-Cell Computers

Question	Never	Rarely	Sometimes	Often	Always
How often do you use your in-cell computer? (Computer use)	3%	2%	7%	22%	67%
How often have you used your in-cell computer to play games? (Games)	18%	14%	27%	21%	19%
How often have you used your in-cell computer to listen to the radio? (Radio)	29%	14%	23%	18%	16%
How often have you used the like / dislike buttons on an	66%	18%	11%	3%	2%

[10] Each prisoner has a financial account within the prison, the computer allows access to view the balance on this account. Money can be added to the financial account through friends and family sending money to the prisoner or through wages earned, money can be spent on items such as clothes, food or for using the telephone.

Question	Never	Rarely	Sometimes	Often	Always
article on your in-cell computer? (Like / Dislike)					
How often have you added a comment to an article on your in-cell computer? (Comment)	58%	18%	17%	5%	2%
How often have you watched factual programmes on your in-cell computer? (Factual)	21%	13%	32%	22%	12%
How often have you watched entertainment programmes on your in-cell computer? (Entertain)	41%	15%	26%	11%	7%
How often have you talked about something that you have watched on your in-cell computer with friends or family outside prison? (Friends)	35%	12%	30%	16%	6%
How often have you watched videos linked to your health on your in-cell computer? (Health)	33%	15%	27%	16%	8%
How often have you watched videos relating to religious beliefs on your in-cell computer? (Religion)	60%	17%	12%	6%	4%
How often have you checked the balance in your account on the in-cell computer? (Money)	7%	1%	8%	27%	58%
How often have you downloaded a Prison Service Order or Prison Service Instruction on your in-cell computer? (PSO)	25%	14%	24%	22%	14%
How often have you watched any videos from the Governor or other managers	26%	17%	25%	15%	17%

Question	Never	Rarely	Sometimes	Often	Always
on your in-cell computer? (Governor)					

Note: Abbreviated labels in brackets used in Tables and Figures to follow. Percentages may not total 100 due to rounding.

Mean, standard deviation, skew and kurtosis were generated for each of the outcome variables and are displayed in Table 3.3. For all variables aside from wellbeing, the range of possible scores was 1 to 5, with higher scores denoting higher values on the psychological variable. Possible scores for wellbeing were between 7 and 35, with higher scores for higher levels of wellbeing. The mean for wellbeing was below the mid-point of the possible scores. Agency for desistance and autonomy were the variables with the highest mean score across the variables. Skew for all variables was below one, as might be anticipated for a large sample of participants. Kurtosis was highest for the growth (-1.095) and trust (-1.030) variables, the remainder of kurtosis values were below one, again as might be anticipated for the sample size. George and Mallory (2010) suggest that normality can be assumed if kurtosis is between -2 and 2, scores on all measures were between these points. Hair et al. (2010) propose an acceptable range for skew between -2 and 2, again, all scores were between these points and therefore normality of the distributions were assumed. Cronbach's alpha was calculated for each of the measures and are shown in Table 3.3. For seven of the eight measures, Cronbach's alpha was above 0.7, which is considered satisfactory (Bland & Altman, 1997). A lower Cronbach's alpha was reported for the autonomy scale of 0.63, indicating that the measure had lower internal validity.

Table 3.3

Descriptive Statistics for Outcome Variables and Potential Mediating Variables

Variable	Items in scale	Mean	Std dev	Skew	Kurtosis	Cronbach's alpha
Wellbeing	7	19.470	6.118	-0.408	-0.007	0.9
	10	3.894	0.813	-0.923	0.766	0.78

Variable	Items in scale	Mean	Std dev	Skew	Kurtosis	Cronbach's alpha
Agency for desistance						
Growth	9	2.684	1.203	0.065	-1.095	0.95
Autonomy	8	3.199	0.705	-0.315	0.224	0.63
Personal control	3	2.948	1.185	0.059	-0.891	0.72
Perceived general support	4	2.350	1.075	0.348	-0.733	0.88
Perceived support from prison staff	13	2.437	1.025	0.288	-0.857	0.95
Trust in staff	2	2.416	1.238	0.316	-1.030	0.89

Research Question 1: Analysis Overview

Manifest content analysis was used to analyse the free text responses, following the process described in Kleinheksel et al. (2020). This method was selected as the free text responses were brief responses where the meaning was contained in the surface of the text. A quantitative approach to analysing the text was taken, to provide results which could inform policy makers of patterns in the frequency of participant responses to questions, and to inform the interview structure and analysis for the qualitative study described in Chapter 4. The responses from the four free text responses were used to answer four specific research questions:

1. What do participants like about using the in-cell computers?

2. What do participants dislike about using the in-cell computers?

3. What do participants use their in-cell computers for?

4. What changes would participants like to see made relating to the in-cell computers?

Some responses to survey questions provided data for different research questions, for example, suggestions for changes to the computers could be found in the responses to the question relating to what was disliked. Responses from all four survey questions were therefore coded for each of the research questions, coded data was then grouped into categories, and quantitative frequencies calculated.

Sentiment analysis and text mining were also used to explore participants' responses from the question "what do you like about the computers?". Sentiment analysis quantitatively explores text data, categorising words by their emotional meaning. In this study words from the responses were placed into eight different categories of emotions. This analysis was included to explore patterns in the emotional meaning behind why participants liked using the in-cell computers and to inform how use of the computers may lead to adjustments in psychological outcomes. Text mining was carried out using the tm package (Feinerer & Hornik, 2022), to remove stop words, punctuation, and spaces. Words were stemmed to collate terms with the same meaning. Sentiment analysis was carried out using the syuzhet package in R (Jockers, 2015) to provide an overview of the emotions expressed by participants in their answer to the question.

Research Question 1: Data Analysis

Free Text Analysis

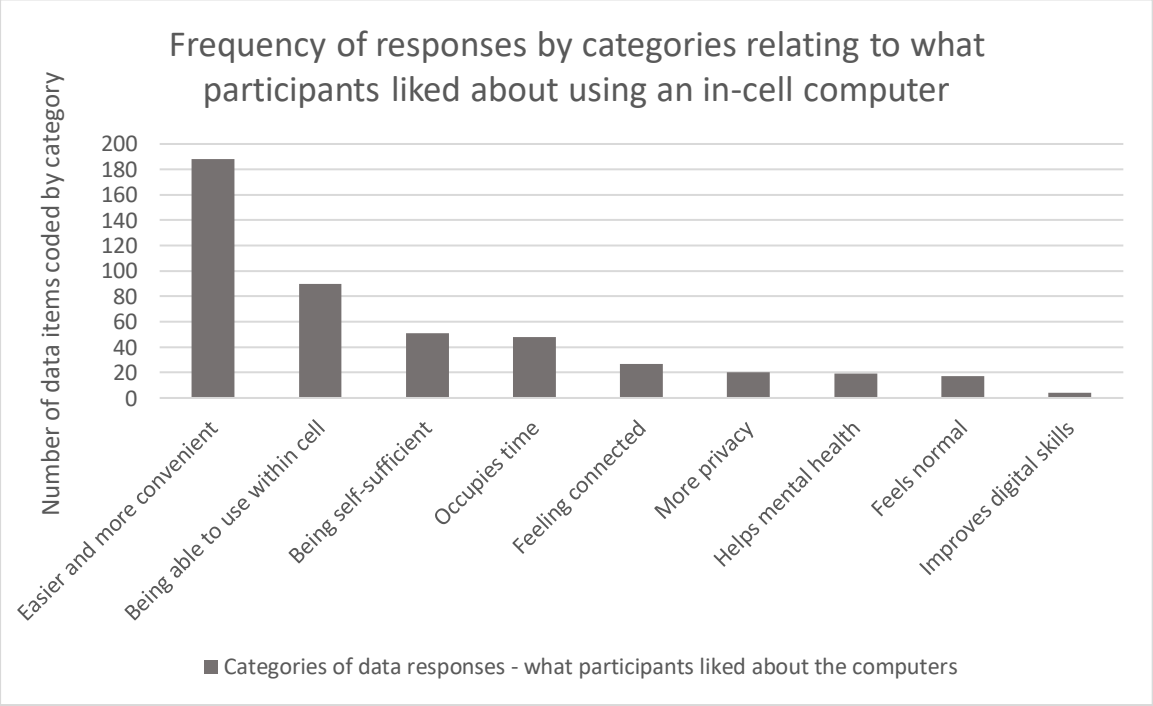
Quantitative content analysis explored four research questions; the results are presented in relation to each of these research questions.

Question 1. What did the Participants Like About Using an in-cell Computer? Responses from the four free text survey questions were coded and categorised in relation to what participants liked about the in-cell computers. The results are displayed in Figure 3.3. In total, 464 pieces of data were coded relating to this research question. The most common category of response (188 responses) was that in which participants stated that they liked the ease and convenience of using

the computers. Comments in this category included references to the computers being easier to use than the paper-based alternatives, or to the convenience of being able to access the computers at any time. The second most frequently responded category (90 responses) involved references to being able to complete tasks in their cell. Participants commented that this reduced the need for them to queue to use the shared computers on the wing, and that they did not feel rushed in the way that they would have been if using the shared wing-based computers. 51 responses related to being self-sufficient, such as “I can do things for myself rather than have to ask staff”. 48 responses referred to how the computers occupied participant’s time and provided entertainment. 87 responses related to the remaining categories shown in Figure 3.3. which included feeling connected, providing increased privacy, supporting mental health, providing a sense of normality, and supporting digital skills.

Figure 3.3

Frequency of Responses by Category for Free Text Question One

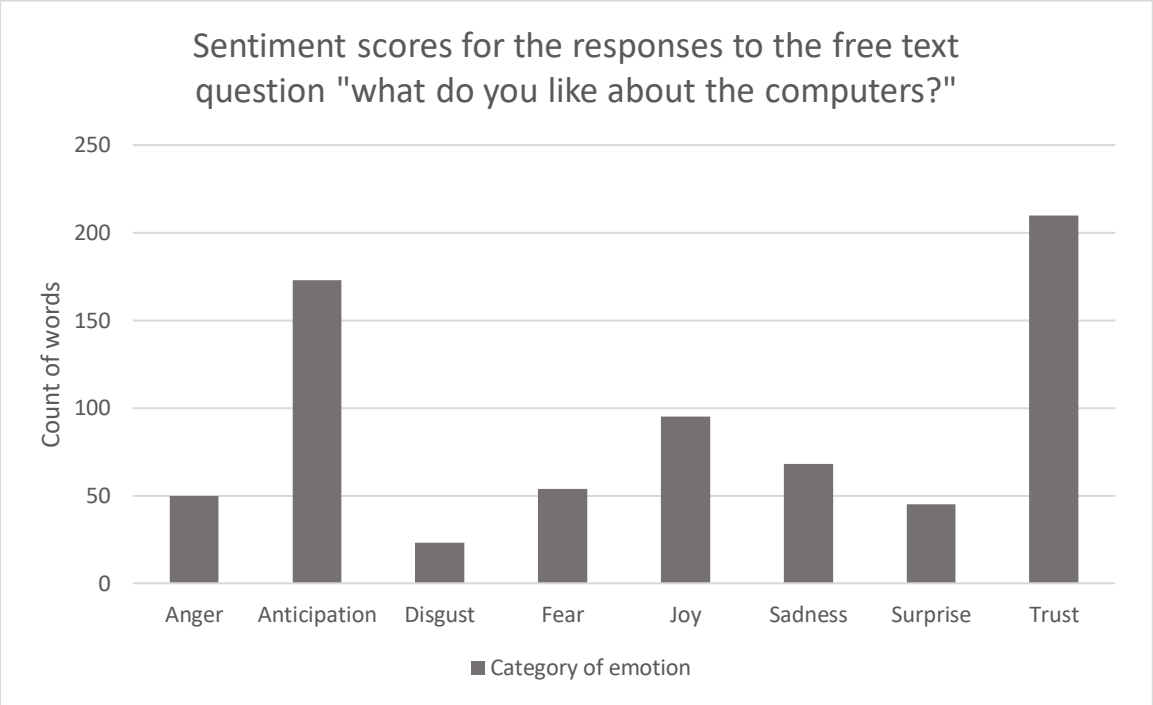


In addition to exploring the frequency of responses to the question “what do you like about the computers?”, the data was also analysed using sentiment analysis. Sentiment analysis is a

process of analysing and categorising text by the emotional tone of the words. Sentiment analysis was used to categorise words, by their emotional tone into the categories, anger, anticipation, disgust, fear, joy, sadness, surprise, and trust. Responses were assigned to one of the categories. Figure 3.4 shows that the most common emotional category that words were assigned to was that of trust. The least common emotional category was that of disgust.

Figure 3.4

Sentiment Scores for Responses to Free Text Question One

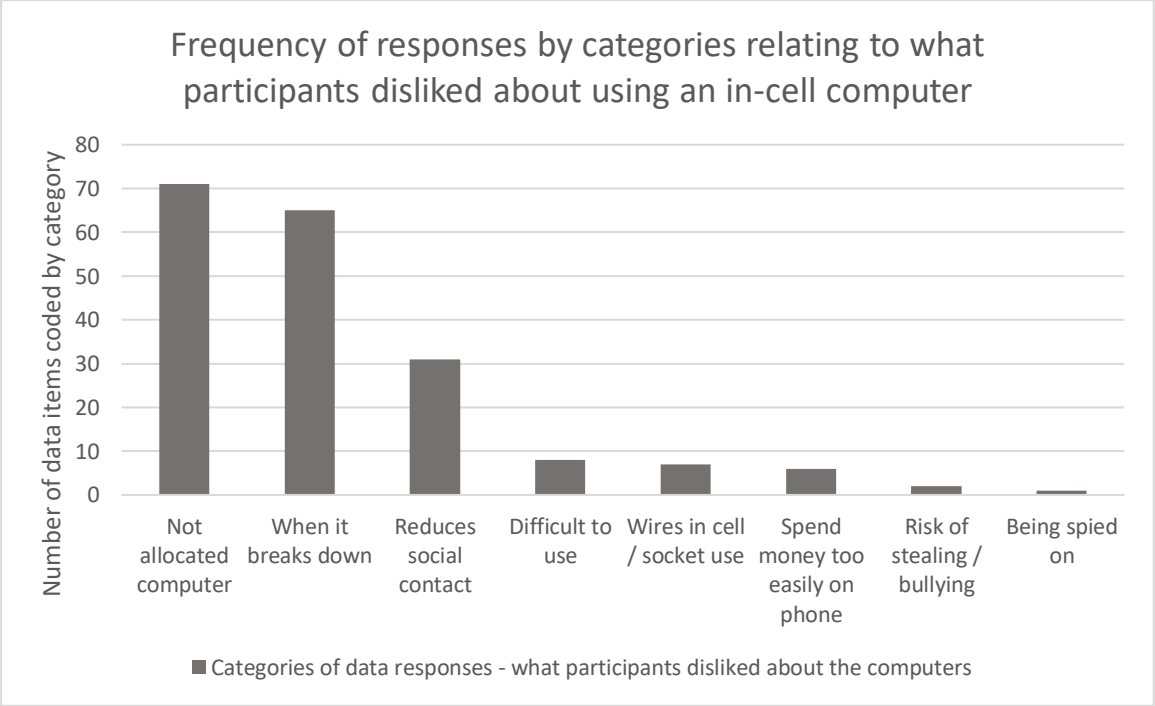


Question 2. What did Participants Dislike About Using an in-cell Computer? The majority of participants gave positive responses about using the in-cell computers; in response to the question “what do you dislike about the computers”, 405 participants gave the response that there was nothing that they disliked. Responses from the four free text survey questions were coded and categorised in relation to issues which participants described disliking about the in-cell computers. The results are displayed in Figure 3.5. In total, 191 pieces of data were coded relating to this research question. The most common category of response (71 responses) was that relating to not being allocated a computer or needing to share with another prisoner. Participants described that

this involved having to continually change their password, and commented as the systems were digital, the prison was not easy to live in without a computer. The next most frequent dislikes (65 responses) were related to when the computer systems broke down or the speed of the connection prevented effective use. 31 responses related to the impact that the computers had on social connection, participants commented that as they were able to complete more tasks within their cells, this led to the prison providing less time out of the cell and therefore reduced social interaction. Other response categories included finding the computers difficult to use, having many wires in the cell and using a plug socket, spending too much money on phone credit, risk of the computer being stolen or being bullied for it, and being spied on.

Figure 3.5

Frequency of Responses by Category for Free Text Question Two



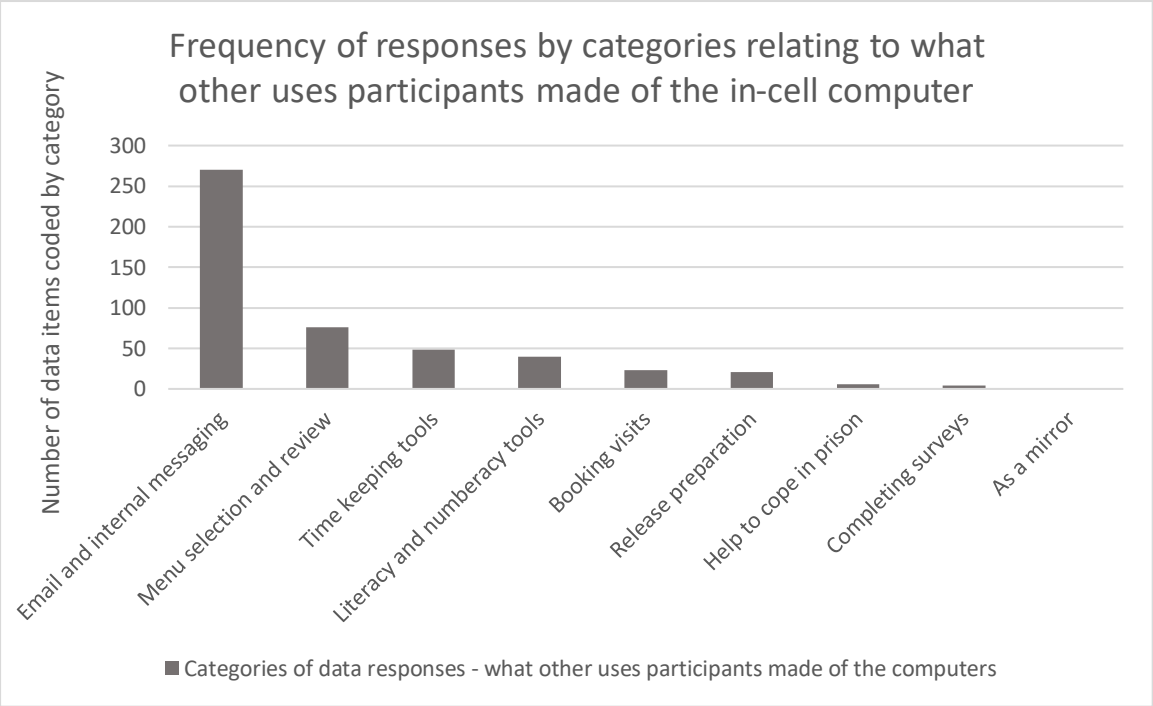
Question 3. What Other Purposes are the in-cell Computers Used for? Participants were asked directly about their frequency of use of the computers in relation to a number of different computer functions. The results of these questions are reported within Table 3.2. Research question three sought to explore any further uses made of the computers, not captured by the survey

questions. This would inform policy makers and guide the areas for exploration in future research studies.

Responses from the four free text survey questions were coded and categorised in relation to uses, other than those in the survey questions, that participants reported using the computers for. In total, 489 pieces of data were coded relating to this research question. By far the largest response category (270 responses) was that of emailing or internal messaging within the prison. Participants described using the computers to connect with others through the application process in the prison, the department messaging facility, and the email a prisoner scheme. The next most common category was that of using the computer to select and review their meal choices (79 responses). Particular functions on the computers were also referenced as valuable by participants, for example the clock, the timetable and the calendar to enable keeping track of time (48 responses). Similarly, the spellcheck and the calculator were tools used to assist literacy and numeracy (40 responses). Other categories included booking visits for friends and family, preparing for release (through qualifications or job applications), coping in prison (through accessing psychological and drug support), completing surveys, and using the computer as a mirror. The frequency of responses by category is shown in Figure 3.6.

Figure 3.6

Frequency of Responses by Category for Free Text Question Three

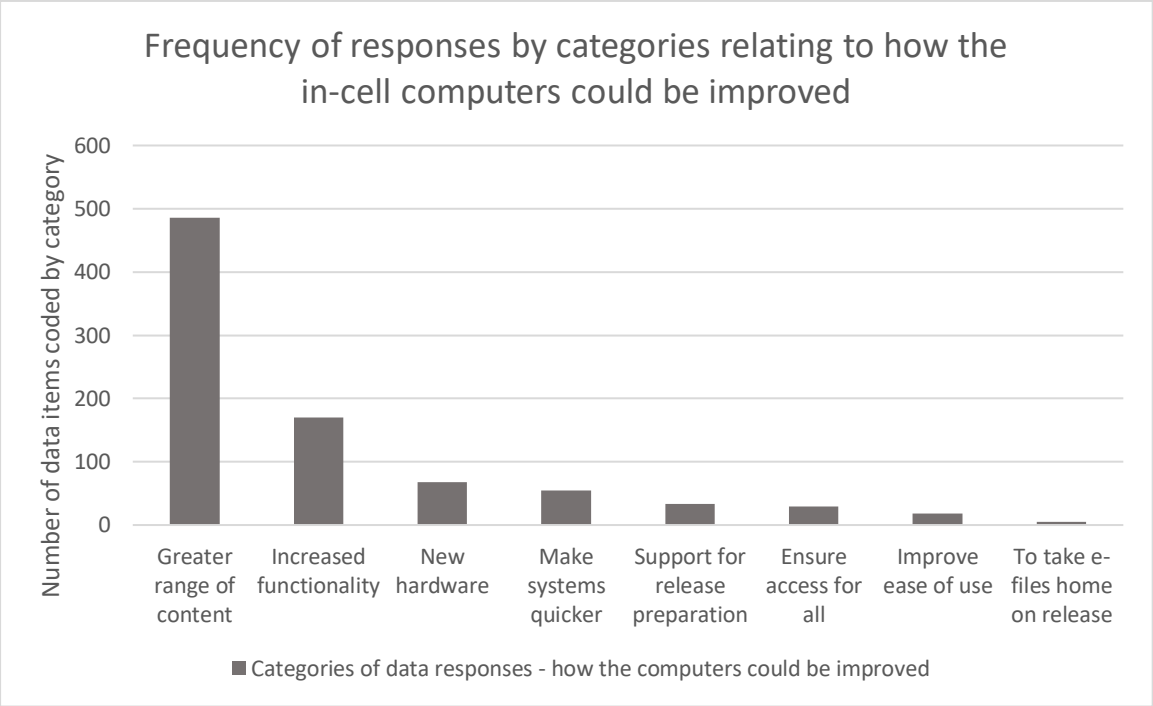


Question 4. How Could the in-cell Computers be Improved? Participants gave suggestions as to how the computers might be improved across the questions asking what they disliked, and what could be improved. The 864 responses related to this question were coded and categorised, with the results displayed in Figure 3.7. The category with the most responses (486 responses) related to requests for increased content, for example a greater range of games, more documentaries, and more music content. The next category (170 responses) related to improvements in the functionality of the computers, a number of participants requested that video visits be accessible via the in-cell computers as well as access to the internet and social media. 68 responses were made under the category of improving the hardware, some participants identified that computers required upgrading or replacing, with other requests for better speakers and the ability to zoom in on photos. 55 responses related to making the systems quicker, some of these related to the functioning of the computers themselves, and others to the systems behind the processes, such as the time staff took to respond to applications. Other categories displayed in

Figure 3.7 relate to requesting content to prepare for release, such as more adverts for job opportunities and psychological support, ensuring all prisoners have access to their own computer, improving the ease of use and finally, allowing prisoners to take e-files and digital photos with them when they leave prison.

Figure 3.7

Frequency of Responses by Category for Free Text Question Four



Research Questions 2 and 3: Analysis Overview

The software package R (R Core Team, 2022) was used for the analysis. Pearson's correlations and descriptive statistics were generated for all variables using the Hmisc (Harrell, 2004) and Psych (Revelle, 2022) packages in R. A series of parallel mediation models were then specified using the package lavaan (Rosseel, 2012). A bootstrapping approach (Efron & Tibshirani, 1993) was used, a process which involves resampling with replacement from the sample data, to mimic further unique samples for the study. This process simulates a greater population sample (assuming that the original sample is representative of the overall population) and assists with non-normality of the data. A larger number of bootstrap draws increases confidence in the findings of the analysis (Hayes, 2022), the number of bootstrap samples was set to 10000. A seed command was used, this means that the bootstrapping process began from the same point for each analysis, allowing outputs to be reproducible. Models were specified for each of the outcome variables using all potential mediators. A trimming process was used to remove mediators that were not significantly contributing to the model, specifying nested models, and comparing the fit of the models using the compareFIt function in R. The most parsimonious model was then selected through comparison of the Akaike Information Criteria (AIC) (Akaike, 2011) and Bayesian Information Criteria (BIC) (Schwarz, 1978) for the original and trimmed models. Consideration was given to controlling for demographic covariates, such as age. A previous study (Barkworth et al., 2022) did not find a relationship between age, or other demographics recorded in the current study, and computer use. As there was no indication that particular demographics would be likely to influence the relationships these were not included in the models.

Research Questions 2 and 3: Data Analysis

Correlation Analysis

Table 3.4 shows the correlation matrix between the types and frequency of use of the computers. There was significant correlation between types of use of the computers, indicating that

high frequency users of one function of the computers tend to be high frequency users across other functions. The only combination of uses that was not significantly correlated were frequency of use of the “dislike” button (to indicate dislike of content on the computer) and checking of finances. The highest correlations were between the variable family (how frequently prisoners spoke to their friends and family about content they have viewed on the computer) and the variables factual (how frequently prisoners had viewed documentary type programmes on the computer) and health (how frequently prisoners had watched videos linked to their physical or mental health on the computer).

Table 3.4

Correlation Matrix of Type and Frequency of Use Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Computer use	-													
2. Games	.37***	-												
3. Radio	.28***	.38 ***	-											
4. Like	.19***	.27 ***	.38 ***	-										
5. Dislike	.07*	.15 ***	.29 ***	.58 ***	-									
6. Comment	.19 ***	.23 ***	.30 ***	.67 ***	.59 ***	-								
7. Factual	.29 ***	.28 ***	.43 ***	.42 ***	.26 ***	.37 ***	-							
8. Entertain	.17 ***	.20 ***	.31 ***	.29 ***	.21 ***	.25 ***	.47 ***	-						
9. Family	.29 ***	.27 ***	.43 ***	.50 ***	.25 ***	.39 ***	.64 ***	.37 ***	-					
10. Health	.24 ***	.22 ***	.36 ***	.40 ***	.26 ***	.34 ***	.57 ***	.42 ***	.63 ***	-				
11. Religion	.13 ***	.19 ***	.31 ***	.43 ***	.29 ***	.37 ***	.42 ***	.29 ***	.47 ***	.47 ***	-			
12. Money	.51 ***	.18 ***	.18 ***	.17 ***	.04	.16 ***	.33 ***	.24 ***	.31 ***	.28 ***	.12 ***	-		
13. PSO	.27 ***	.12**	.15 ***	.31 ***	.21 ***	.28 ***	.33 ***	.34 ***	.37 ***	.37 ***	.33 ***	.42 ***	-	
14. Shopping	.27 ***	.12 ***	.20 ***	.26 ***	.20 ***	.21 ***	.29 ***	.34 ***	.34 ***	.38 ***	.22 ***	.34 ***	.35 ***	-
15. Governor	.31 ***	.22 ***	.31 ***	.41 ***	.28 ***	.35 ***	.42 ***	.21 ***	.48 ***	.45 ***	.37 ***	.36 ***	.43 ***	.18 ***

Note: *P<0.05, **p<0.01, ***p<0.001, n=784, see Table 3.2 for full variable description.

Table 3.5 shows the correlation matrix between the global frequency of use of the computers and the outcome and mediating variables. Frequency of use of the computer was significantly correlated ($r=0.08$-0.22, $p<0.05$-$p<0.001$) with all outcome and mediating variables, with higher levels of frequency of use correlating with positive scores across all outcome and mediating variables. The strongest correlates of frequency of use of the computers were with the outcome variables wellbeing and agency for desistance. Outcome and mediating variables were also significantly correlated with each other. The strongest correlation was between the variable for support within prison and the variable for trust, this is not surprising given that both aim to measure the relationship between prisoner and staff but provides an indication of convergent validity for the trust measure, developed for the current study. The next highest correlations were between these same two variables, trust and support within prison and the variable growth. Each of these three variables provides a measure of the climate or environment of a prison, which may explain the observed relationship.

Table 3.5

Correlation Matrix for Global Frequency of Use With Outcome and Mediating Variables

	1	2	3	4	5	6	7	8
Predictor variable:								
1. Computer use	-							
Outcome variables:								
2. Wellbeing	.20***	-						
3. Agency for desistance	.22***	.58 ***	-					
Potential mediating variables:								
4. Growth	.16***	.53 ***	.46 ***	-				
5. Autonomy	.08*	.45 ***	.27 ***	.44 ***	-			
6. Personal control	.17***	.59 ***	.41 ***	.40 ***	.49***	-		
7. Perceived general support	.20***	.45 ***	.30 ***	.40 ***	.36 ***	.44 ***	-	
8. Perceived support from prison	.11**	.45 ***	.31 ***	.74 ***	.37 ***	.34 ***	.43 ***	-
9. Trust in staff	.13***	.41 ***	.33 ***	.72 ***	.34 ***	.32 ***	.38 ***	.88 ***

Note: *P<0.05, **p<0.01, ***p<0.001, n=784, see Table 3.2 for full variable description.

Mediation Analysis

Having confirmed bivariate correlation between frequency of computer use and the outcome variables of wellbeing, and agency for desistance, mediation models were specified to explore potential mediators of the relationships. While there was correlation between the potential mediating variables, there was no theoretical reason to believe that one variable would lead to another, therefore parallel mediation was appropriate. While not providing causal information, mediation analysis enables further exploration of the process by which observed relationships between two variables takes place. Where mediators contribute to the total direct effect between the predictor and the outcome variables, through an indirect effect, this partially informs how the process may be occurring.

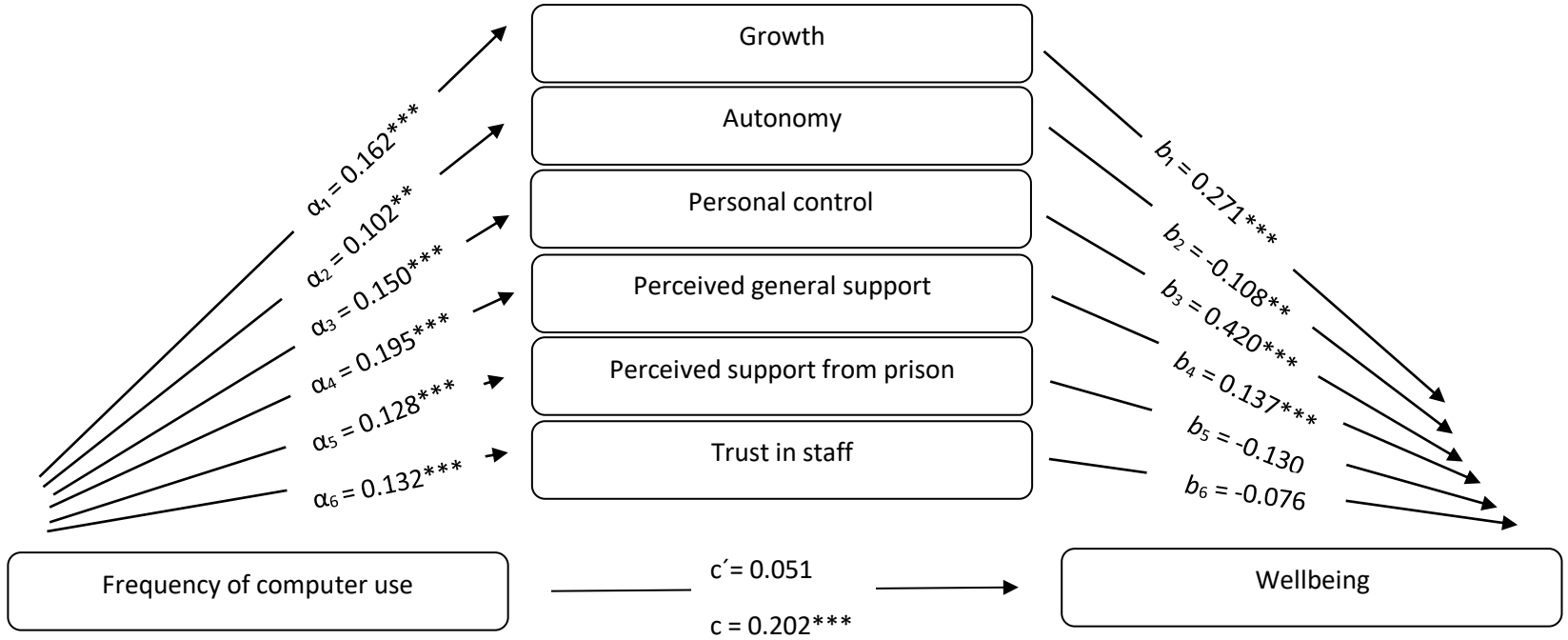
Mediation Models With the Outcome Variable Wellbeing. Initially a model was specified between the predictor variable, global frequency of computer use, and the outcome variable of wellbeing, with all six potential mediators included in the model. 95% confidence intervals (CI) for the unstandardized indirect effects were calculated and an effect of the mediator was determined in instances where the 95% CI did not contain zero. For four mediators, growth, personal control, autonomy and perceived support from prison, the confidence interval did not contain zero, indicating a statistically significant indirect effect via these pathways. The strongest indirect pathways were for the mediators personal control (β= 0.063[11], p<0.001) and growth (β= 0.044, p<0.01). Confidence intervals contained 0 for the proposed mediators of trust and perceived general support, suggesting that neither trust nor perceived general support mediate the relationship between computer usage and well-being. A trimmed model was specified, setting the pathways involving trust and perceived general support to 0 to enable comparison of the original model with a nested model. A significant difference was observed between the original and nested models when the *compareFit* function was applied. The Akaike Information Criterion (AIC) for the original model

[11] β representing the standardised coefficient

was 15546.73 and the Bayesian Information Criterion (BIC) was 15640.01. These were lower than for the nested model, the AIC for which was 15569.39 and the BIC 15644.01, indicating that the original model (R^2 = 0.336) provided the best fit. The model is shown in Figure 3.8. Table 3.6 displays the coefficients for the pathways in Figure 3.8.

Figure 3.8

Model of Computer Use on Wellbeing With Mediating Variables



*Notes: **p<0.01, ***p<0.001, n=783. Standardised estimates are included in the figure.* α_1 - α_6 are the effects of frequency of computer use on the six mediating variables. b_1 - b_6 are the effects of the six mediating variables on wellbeing. *c´ is the direct effect of frequency of computer use on wellbeing, c is the total effect of frequency of computer use on wellbeing.*

Table 3.6

Regression Coefficients for Model of Computer Use on Wellbeing

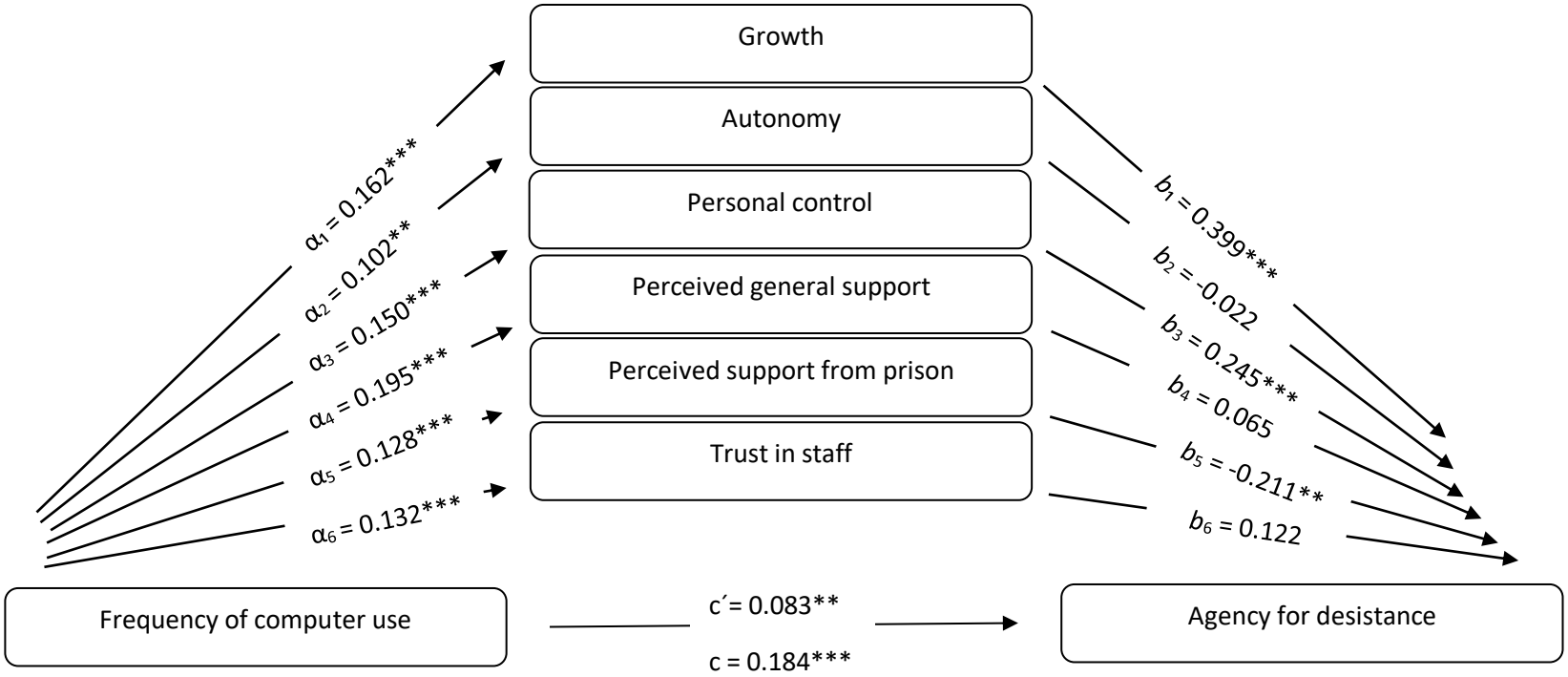
Predictor variable	Mediating variables	Outcome variable	Indirect effect (*ai*bi*) coefficient (standardised)	Indirect effect (*ai*bi*) std error	Indirect effect (*ai*bi*) lower 95% confidence interval	Indirect effect (*ai*bi*) upper 95% confidence interval	R^2
Frequency of computer use	Growth	Wellbeing	0.058 (0.044)**	0.017	0.028	0.094	0.026
Frequency of computer use	Autonomy	Wellbeing	0.014 (0.011)	0.007	0.002	0.031	0.010
Frequency of computer use	Personal control	Wellbeing	0.083 (0.063)***	0.022	0.041	0.128	0.023
Frequency of computer use	Perceived general support	Wellbeing	0.035 (0.027)**	0.012	0.014	0.060	0.038
Frequency of computer use	Perceived support from prison	Wellbeing	0.022 (0.017)	0.014	-0.002	0.054	0.016
Frequency of computer use	Trust in staff	Wellbeing	-0.013 (-0.010)	0.012	-0.040	0.007	0.017

Note: **p<0.01, ***p<0.001

Mediation Models With the Outcome Variable Agency for Desistance. A further model was specified between the predictor variable, global frequency of computer use, and the outcome variable of agency for desistance, with all six potential mediators included in the model. Three mediators, growth, personal control, and perceived support from prison, showed confidence intervals which did not contain 0, indicating a significant indirect effect via these pathways. The strongest indirect pathways were for the mediators growth ($\beta = 0.065$, $p<0.001$) and personal control ($\beta = 0.037$, $p<0.01$). Confidence intervals contained 0 for the proposed mediators of autonomy, trust, and perceived general support. A trimmed model was specified, setting the pathways involving autonomy, trust, and perceived general support to 0 to enable comparison of the original model with a nested model controlling for the non-significant pathways. A significant difference was observed between the original and nested models when the *compareFit* function was applied. The AIC for the original model was 15380.26 and the BIC was 15473.52. These were lower than for the nested model, the AIC for which was 15414.30 and the BIC 15488.91, indicating that the original model ($R^2 = 0.311$) provided the best fit. The model is shown in Figure 3.9. Table 3.7 displays the coefficients for the pathways in Figure 3.9.

Figure 3.9

Model of Computer Use on Agency for Desistance With Mediating Variables



*Notes: **p<0.01, ***p<0.001, n=783. Standardised estimates are included in the figure.* α_1 - α_6 are the effects of frequency of computer use on the six mediating variables. b_1 - b_6 are the effects of the six mediating variables on agency for desistance. *c´ is the direct effect of frequency of computer use on agency for desistance, c is the total effect of frequency of computer use on agency for desistance.*

Table 3.7

Regression Coefficients for Model of Computer Use on Agency for Desistance

Predictor variable	Mediating variables	Outcome variable	Indirect effect (*ai*bi*) coefficient (standardised)	Indirect effect (*ai*bi*) std error	Indirect effect (*ai*bi*) lower 95% confidence interval	Indirect effect (*ai*bi*) upper 95% confidence interval	R^2
Frequency of computer use	Growth	Agency for desistance	0.075 (0.065)***	0.019	0.040	0.113	0.026
Frequency of computer use	Autonomy	Agency for desistance	-0.003 (-0.002)	0.005	-0.014	0.008	0.010
Frequency of computer use	Personal control	Agency for desistance	0.043 (0.037)**	0.013	0.019	0.069	0.023
Frequency of computer use	Perceived general support	Agency for desistance	0.015 (0.013)	0.009	-0.001	0.003	0.038
Frequency of computer use	Perceived support from prison	Agency for desistance	-0.031 (-0.027)*	0.014	-0.063	-0.009	0.016
Frequency of computer use	Trust in staff	Agency for desistance	0.019 (0.016)	0.011	-0.000	0.043	0.017

Note: *P<0.05, **p<0.01, ***p<0.001

Discussion

While previous research has highlighted benefits that technology may bring to prisons, there is limited research exploring the specific technology of personal computers for prisoners within prison cells. This study sought to close this gap. The main research question that the study set out to answer was:

What are the potential psychological outcomes associated with in-cell computer use?

Within this main research question, were the following research objectives:

1. Given the novelty of prisoner access to in-cell computers, to explore how prisoners use the in-cell computers and how they experience and evaluate living with an in-cell computer.

2. To explore how the use of in-cell computers is related to rehabilitation, through the outcome variables of wellbeing and agency for desistance.

3. To explore the psychological processes taking place within any relationships between computer use and wellbeing, and computer use and agency for desistance.

In the discussion to follow, the three research objectives will be explored in relation to the study results.

Summary of Findings in Relation to Research Objectives

In relation to research objective one, the computers were generally liked by the prisoners, with a majority reporting that there was “nothing” that they disliked about them. Specifically, the computers were reported to be easier and more convenient to use than the alternative options – either using the wing-based computer or a paper-based system. The location of the computers was important, prisoners liked being able to use the computer from their cell, this allowed prisoners to take the time they chose to complete tasks and freedom to choose when to use the computer.

Prisoners also appreciated the self-sufficiency that the computers provided, reporting that they were less reliant on support from staff to complete tasks. Prisoner responses to what they liked about the computers were most strongly categorised in the emotional category “trust”. Trust is a key feature within a healthy prison environment and features strongly within the procedural justice approach (Thibaut & Walker, 1975). This finding suggests that the in-cell computers may increase feelings of confidence and trust towards the prison more broadly. There were a number of areas of computer use that prisoners disliked, the most common of which related to the difficulty of managing life in a digital prison without access to a computer. The barriers to access that prisoners referenced included having to share a computer with another prisoner, or when the computers broke down. Prisoners also perceived that due to being able to complete tasks in their cells, the prison provided them with less time out of their cell, leading to reduced social contact. The study did not collect evidence to explore if there was a relationship between the computer installation and time spent within the cell, however, participants attributed a link between the two. When asked to rate their frequency of use of the computers for particular tasks, checking of account balance and to play games were the most frequently reported uses. In the free text box response to other uses that they made of the computer, prisoners most frequently mentioned the messaging processes – both to communicate with people outside prison and to message departments in the prison. Other uses referenced were tools on the computers that were used to support life in prison, such as the clock, the calendar, the spellcheck and the calculator. The correlation analysis between types of use of the computer showed significant relationships between most uses of the computer, that is, prisoners who were high frequency users of the computers were more likely to be high users of each of the functions explored, and vice versa with low frequency users. This may be a proxy reflection of prisoner confidence with use of the computers, that is, those prisoners with higher levels of digital experience were more confident in exploring the opportunities across the platform than prisoners with little previous experience of computers, or lower levels of confidence. Future research studies may wish to explore the role that prior experience of computer use has on the frequency of

computer use within prison. The strongest correlations between types of use observed were between frequency of use of the “comment” function and the “like” and the “dislike” buttons. These functions are available below articles and videos (such as nature documentaries or videos from prison managers) uploaded to the site by the local or national digital content team. Use of these functions indicate an engagement by the user with the platform and an interest in providing feedback to the developers or content providers. It may indicate a desire to control or shape the prison environment, in a context in which prisoners have reduced control over their lives relative to outside prison.

In relation to research objective two, the results showed a statistically significant relationship between computer use and the outcome variables of wellbeing, and agency for desistance. The positive relationship between frequency of computer use and wellbeing in the current study suggests that use of a computer within the prison cell enables prisoners to achieve a greater degree of wellbeing. Although the correlational design of the current study does not provide evidence of the direction of the relationship, previous research (Palmer et al., 2020; Thaler et al., 2022) found that prisoners report improvements to their emotional wellbeing as a result of access to computers. The current study is the first to explore the relationship between in-cell computer use and wellbeing within UK prisons. Improvements in prisoner wellbeing is significant in relation to achieving successful prison outcomes of rehabilitation and safety. Prisoner wellbeing is considered a foundation stone from which other rehabilitative needs can be attended to, such as substance use or antisocial attitudes (Mann et al., 2018). Through supporting wellbeing therefore, the computers increase the likelihood of change in a rehabilitative direction. Marzano et al. (2016), in a systematic review of research to prevent suicidal behaviours in prison, found that improvements to the environment protected against risk of suicide or self-harm. The current study finds that computer access may be an environmental adjustment that contributes to a safer environment for prisoners through supporting wellbeing with a potential link to reduced risk of self-harm. The results also found a significant relationship between computer use and the outcome variable agency for

desistance. This is an important indicator of prisoners' individual intentions for their future on release from prison, with those using the computers more regularly, expressing stronger intents to desist from crime. Maruna (2001) highlighted the role of agency and control over one's future as contributors to a person's ability to desist from offending and to live a crime free life. Further, Lloyd and Serin (2012) noted a relationship between agency to desist and prisoner expectations of the outcomes of crime (that is, whether crime was expected to have positive or negative outcomes), with increased agency being related to positive desistance outcome expectancies. The findings suggest that use of the computers, develop beliefs among the prisoners that they can live a life without crime on release. The potential mechanisms by which this takes place were the focus of research objective three and are discussed below.

In relation to research objective three, six mediators were identified that partially explained the processes by which frequency of use of the computers related to the outcome variables wellbeing, and agency for desistance. This supports the proposed model in Figure 2.1 that computer use may relate to wellbeing and agency for desistance through the broad pathways of developing coping and resilience, through providing control and autonomy, and through maintaining relationships. This is consistent with van Ginnekan and Palmen's (2023) study, which explored the relationship between prisoners' experience of prison climate and reoffending on release. Their study reported associations between prisoners' positive reporting of autonomy, peer relationships, and meaningful activities with subsequent reduced reoffending. The current study finds that in-cell computers are associated with three similar pathways, improving the experience of the prison environment and its rehabilitative potential. The first of these pathways was demonstrated through the mediating variable of growth within the prison climate. This was one of the strongest mediating variables in both models and reflects the prisoners' feelings that the prison is a place that they can develop and grow. A number of functions of the computers may contribute to this finding, such as the inclusion of games, entertainment shows, and information about prison or release. By providing an environment that the prisoner perceives to be safe, soothing and to provide guidance on next

steps, the computers facilitate the outcome variables of feeling greater wellbeing and further feeling agency to live a crime free life. Liebling et al. (2019), in a study exploring an English prison with a particularly positive climate, identified the presence of hope and opportunities for prisoners to change as key elements contributing to the positive environment. In the current study, the in-cell computers appear to contribute to an environment in which prisoners perceive opportunities to grow and develop. The second of the pathways in Figure 2.1 describes the role of self-governing skills, measured in the current study through the mediating variables of personal control and autonomy. In a study of the experience of prisoners at a maximum-security prison in the United States of America, Sykes (1958) identified deprivation of autonomy as one of the five pains of imprisonment. Autonomy, and the ability to make even relatively small choices, has been shown to make a difference to the quality of prison life experienced (van der Kaap-Deeder, 2017). The in-cell computers quite literally put control of their day-to-day actions into the prisoners' hands, through enabling checking of the account balance (noted to be a frequently used function), selecting meal choices, topping up phone credit and messaging departments within the prison. Prisoners reported a difference in their identity as a result, from being someone dependent on others to effect action, to being a person who takes control of these actions for themselves. The models in Figures 3.8 and 3.9 illustrate the role that this ability to self-manage has on the outcome variables of wellbeing and agency for desistance. The final pathway from Figure 3.1 is that of connectedness, measured in the current study through three mediating variables, perceived general support, perceived support from prison and trust in prison staff. Prisoner relationships with prison staff (Crewe, 2011) and with family and friends (La Vigne et al., 2005) have each been identified as relevant to achieving a positive prison environment. Jewkes and Johnstone (2009) argue that the absence of access to computer mediated communication, impairs relationships and can be considered a pain (Sykes, 1958) of modern imprisonment. In the current study, the computers allowed prisoners to contact other departments, to email friends and family, to top up their telephone credit and also provide content which may form points of discussion with those outside prison. Further, placing responsibility to

complete tasks in the hands of prisoners, had the potential to alter the relationship between prisoner and prison staff, through reducing the demands made by prisoners. The findings from the current study indicate that these functions are related to improved feelings of connectedness with others inside and outside prison. The role of support and connection to successful outcomes on release from prison has been demonstrated (De Claire, 2012), and in itself is a valuable outcome. In this study it is also found to mediate the pathway to improved custodial wellbeing, and pre-release feelings of agency for desistance.

Contribution to Theory

The current study builds on the limited knowledge base related to technology in prisons. Previous to the current study, the literature indicated that technology had the potential to make positive behavioural and psychological improvements for prisoners (Barkworth et al., 2022; Knight, 2012; McDougall et al., 2017; Palmer et al., 2020; Robberechts, 2022; Thaler et al. 2022). McDougall et al., (2017) proposed a theory of change through which prisoner access to wing-based computers might lead to improved wellbeing, reductions in custodial rule breaking, and reduced reoffending on release. The theory posited that this change might occur through several mechanisms, including, improved family relationships, increased feelings of self-responsibility, and reduced dependency on prison officers. While McDougall et al. (2017) found support for the outcome measure of reduced reoffending, the current study provides evidence for the psychological mechanisms that may lead to behavioural change following technology installation. The results found six psychological variables that mediated the relationship between technology use and agency for desistance, which is an indicator of intent to follow a future desistance pathway. The mediating variables, personal control and growth contributed most strongly to the mediation effect. The current study also supports the theory of positive technology (Riva et al., 2014) that interaction with technology can bring about improvements to wellbeing through eudaimonic, hedonic, and connective pathways. The mediating variables in the specified models in the current study, which included coping, self-governing, and

connecting pathways, map onto those defined within the theory of positive technology (Riva et al., 2014). This suggests that the theory of positive technology may be applicable to custodial as well as community environments.

Given the recency of technology introduction to prisons, the model of change through which technology in prisons might impact on rehabilitative behaviour is at an early stage. It is essential that research continues to build on this theory, to inform future prison design, specifically around the type and location of technologies, and the embedded digital content. To date, studies have focused on overall outcomes, related to behavioural change. The current study reveals psychological pathways through which such change is occurring.

Next Steps

This study has found a relationship between use of personal computers by prisoners and the outcome variables of wellbeing and agency for desistance. It has further demonstrated models with mediating variables which partially account for these relationships. Consequently, the current study has furthered the field's understanding of the role of personal computers in prison settings. While the quantitative data has demonstrated a relationship between variables, qualitative data to explain this relationship as experienced by prisoners provides richness to the data to understand the phenomenon on a deeper level. The second part of this explanatory sequential mixed methods study adding this qualitative element, follows in Chapter 4.

As with Chapter 2, to avoid repetition across chapters, limitations and strengths of this study, as well as implications for policy, and future recommended research will be considered in the thesis discussion, in Chapter 5. Of specific relevance for the current chapter, Chapter 5 explores the strengths and limitations of the study design and participant selection in relation to interpretation of the results.

Chapter 4

Study 3 - Exploring Prisoner Experiences of Living With an In-Cell Computer

Chapter 3 reported study 2, a quantitative study, gathering data via a survey, distributed via the in-cell computers. Prisoners were asked about how they used the computers, and what they liked and disliked about them. The study also explored the relationship between prisoner access to personal computers and rehabilitation, finding that computer use was related to wellbeing and agency for desistance. These relationships were mediated by six variables, growth, autonomy, personal control, perceived general support, perceived support from prison, and trust of staff. Of these mediators, use of the computers appeared particularly related to prisoners' sense of being able to grow and develop at the prison, and to experiencing greater personal control over their day to day lives. This chapter investigates these experiences more closely using a qualitative methodology to analyse the views of prisoners, building on the previous findings, in order to better understand how computers in prison cells are building a rehabilitative environment. The research forms the second part of an exploratory sequential mixed methods study. Results of the two studies are integrated in the discussion section for the current chapter and further in the overall thesis discussion in Chapter 5. The introduction begins by critically exploring the potential link between key psychological phenomena (control and agency; procedural justice; and relationships and wellbeing) and prisoners' use of personal computers.

Control, Autonomy and Computers in Prisons

Mammals prefer the provision of choice. Chimpanzees and tigers for example, both show more positive reactions when given the option of choice to spend their time inside or outside (Kurtcyz et al., 2014; Ritzler et al., 2021). Humans similarly show increased motivation, perceived control, and life satisfaction when they are placed in a situation offering choice relative to a situation offering no choice (Deci & Ryan, 1985; Langer & Rodin, 1976). There appears to be an upper limit to the amount of choice that provides intrinsic motivation. Situations where extensive choice is

available leads to lower motivation than situations where limited choice is provided (Iyengar & Leppar, 2000). Further, cultural differences have been observed in relation to the number of choices that are preferred (Iyengar & Leppar, 1999). Despite these caveats, the preference to exercise control over one's life through choice appears to be a universal human experience. Theoretical explanations for why choice, and the ability to control aspects of life, is valued and sought after can be found in the literature around need for identity development (Greenaway et al., 2016; Williams & Nida, 2011) and need for mastery of the human environment (Ryff & Keyes, 1995).

Self-determination theory suggests an explanation for our human preference for choice and autonomy (Deci & Ryan, 2000). This theory posits that humans possess psychological needs for autonomy, competence, and relatedness to achieve the necessary motivation to pursue life goals (Deci & Ryan, 2012). The theory assumes that humans seek out opportunities for growth and have a desire to reach their full human potential. A deficit in any one of the identified psychological needs leads to a decrease in motivation and well-being (Deci & Ryan, 2000). Self-determination theory is an example of an approach which seeks to understand how humans thrive and falls within the positive psychology framework (Sheldon & Ryan, 2011). The conditions under which the three psychological needs of autonomy, competence, and relatedness are met have been explored across work, sport, school, health, and prison settings. Across these settings, where people are frustrated in satisfying their psychological needs, performance and wellbeing are impacted negatively (Mahoney et al., 2014; Morris et al., 2021; Rigby & Ryan, 2018; van der Kaap-Deeder et al., 2017; Vasconcellos et al., 2020). As discussed in Chapter 3, this is particularly relevant to prison contexts where wellbeing is key for prisoner safety, and motivation to work on change enables people to leave prison at lower risk of reoffending.

Institutional environments generally, and prisons specifically, stand out as environments where the opportunities to satisfy the psychological needs of autonomy, competence and relatedness are likely to be limited relative to the wider community. Prisons by necessity involve the

introduction of some restrictions on the choices of people living within them, the restriction of leaving the environment at will, being once such example. While these restrictions may satisfy one element of the justice system, that of containment (Harding et al., 2019), they concurrently erode prisoners' access to personal control and agency (Crewe, 2021). McNeil (2006), in reviewing the change in approaches to managing people who have committed crimes since the 1970s, proposes a desistance-based approach to managing offending, a key part of which is enabling agency. Alongside reflexivity and respectful relationships, McNeil (2006) identifies agency as a central part of a person having the means to bring about internal and external changes which link to desistance from offending. Increasing opportunities for prisoners to satisfy their need for autonomy, and perceived afforded choice, has also been linked to improvements in quality of life within prison (van der Kaap-Deeder et al., 2017).

The introduction of computers into prisons appear to offer the potential to increase prisoner autonomy through several functions available on the computers. The provision of a computer within a person's cell provides the person with self-selected options as to how they will spend their time. The messaging option on the computers, enables direct contact with departments in the prison (such as contact with the prisoner's key worker or offender manager). This allows prisoners to arrange appointments or request information on their sentence, and to update these key individuals on progress made or changes to their situation. In a report compiled using prison surveys and prison visits, Champion and Edgar (2013) concluded that access to personal computers, through which prisoners could manage tasks otherwise completed with the assistance of staff, increased personal responsibility and reduced dependency. Palmer et al. (2020) interviewed and surveyed prisoners and staff following the introduction of in-cell telephones, wing-based computers, and in-cell computers (though the in-cell computers were only available at one of the seven prisons in the study). Both staff and prisoners reported that the technologies were linked to increases in prisoner agency and autonomy. Further, a study by McDougall et al. (2017), which found improvements in reoffending rates and prison behaviour following the introduction of wing-based computers to prisons,

suggested in their discussion that the mechanism through which this occurred was in part due to increased personal control. A research gap was identified at the outset of the current mixed method study, relating to the effect of introducing a specific technology, personal computers within cells, to prisons. The quantitative study reported in Chapter 3 provided first evidence of the rehabilitative effect of living with a personal computer in prison, finding a key role for prisoners' sense of personal control in this effect. This finding requires follow up using a qualitative approach to explore how this is experienced.

Procedural Justice and Computers in Prisons

Prisons fulfil part of the justice system in most cultures, in brief, by employing small numbers of people to contain large numbers of people within relatively small, locked spaces. While prisons include physical restrictions, the day-to-day functioning of the prison relies on the willingness of prisoners to conform, and trust between prisoner officers and prisoners (Liebling & Price, 2012). The likelihood of such willingness and trust links to the perceived legitimacy of the prison, that is, the degree to which those living and working there, and the wider community, believe it to be fair (Tyler, 2006). Where the power that prison staff exercise is seen to be legitimate, prisoners are more likely to comply with the requests made by prison staff (Crewe, 2011).

An extension of the concept of legitimacy within prisons is that of procedural justice, that the processes and procedures that take place within the setting are consistent with ethical standards held by the prisoner (Reisig & Mesko, 2009). A procedurally just system has been described as adhering to four principles: voice, neutrality, respect, and trust (HM Inspectorate of Probation, 2020). The principle of voice relates to providing people with a chance to explain their position and to know that this voice will be listened to. That of neutrality refers to how leaders in the setting are perceived – a neutral leader is considered fair, objective and makes decisions in a transparent manner. Respect relates to having one's rights acknowledged and to be treated in a fair and decent

manner. Finally, the principle of trust relates to the need for leaders to be seen as sincere and authentic.

Several initiatives have been introduced in prisons with the goal of moving towards a measurably more procedurally just environment (Fitzalan Howard & Wakeling, 2020). The introduction of computers within prison cells is an opportunity to mobilise change in the sought after direction through their link with two of the four principles described above. Firstly, in-cell computers have the potential to link to the principle of trust in the establishment. Without a digital system, processes such as messaging prison departments, buying clothes and food, and making medical appointments are achieved through submitting paperwork. Once the form or paper request has been submitted there is no way to track or receive progress updates on the request. A digital system in contrast provides a visible trail, for example, when the request has been received by the department, or a record of the items ordered. Palmer et al. (2020) found prisoners appreciated the additional transparency that access to a wing-based or cell-based computer provided. Secondly the in-cell computers have the potential to link to the procedural justice principle of voice, providing prisoners with a way to contribute their views to the prison. This could occur through two mechanisms: the computer system allowing contact with individuals within the prison, increasing opportunities for prisoner voice to be heard; and through the computers hosting videos or notes from community meetings. Improving access to the processes taking place at these meetings provides a way for prisoners to witness how decisions are being taken, and to input to this process through their prisoner representatives. There is currently no research exploring if prisoners experience prisons as more procedurally just when they have access to a personal computer. The current study aims to explore prisoners' experiences of procedural justice when living in a prison with in-cell computer access.

Wellbeing, Relationships and Computers in Prisons

Although a commonly used term, defining what is meant by 'wellbeing' has challenged researchers (Dodge et al., 2012). Dodge et al. (2012) propose a definition of wellbeing as a balance point between the resources that an individual can draw from (psychological, social, and physical) and the challenges (psychological, social, and physical) that they are facing. Stable wellbeing in the model is achieved when a person has the resources that they need to deal with the challenges that they face. The balance or seesaw nature of the model emphasises that wellbeing is dynamic, changing for each person as their resources and challenges change. Ryff's (1989) widely researched eudaimonic model of psychological wellbeing emphasizes a focus on the human need for meaning making and self-realisation, through six contributing components. This model of wellbeing, incorporating autonomy, environmental mastery, personal growth, relationships, purpose, and self-acceptance, has been applied across home and work settings (Ryff, 2013). Ryff (2013) referencing the range of studies and participant types that the model of wellbeing has been studied with, suggests that the value of satisfying eudaemonic need appears to relate to wellbeing across different populations. As described above, self-determination theory (Deci & Ryan, 2000) also highlights how feelings of wellbeing are dependent on being able to achieve a degree of competence, relatedness, and autonomy. Both the model of psychological wellbeing and self-determination theory suggest that providing opportunities for individuals to make choices for themselves, to grow and develop, and to build a supportive network, is likely to build greater wellbeing.

In most settings, such as schools, hospitals and other community groups, promotion of and realisation of wellbeing for those using the services of the setting is taken to be a self-evident objective. Aside from increased wellbeing itself presenting a valued goal for such settings, interventions to develop wellbeing have positive outcomes for improved mental health (Keyes, 2002). For prisons, the degree to which the wellbeing of those serving sentences is prioritised over the objective of deterrence has been less universally agreed upon, with some commentators using

secondary benefits of improving wellbeing, such as improving prison order and discipline, as being the key outcome achieved by attending to prisoner needs (Hoke & Demory, 2014). Whether accepted as a primary objective (prisons should attend to prisoner wellbeing for its own purpose), or as a secondary objective (attending to wellbeing will lead to improved outcomes in relation to custodial behaviour or behaviour on release), improved wellbeing is related to positive prison outcomes. For example, prisoner wellbeing is related to decreased reoffending on release (Wallace & Wang, 2020) and is protective against mental illness, distress, and self-harm within prisons (Perry, 2020). Prevalence of self-harm and distress is consistently found to be higher in prison relative to community populations (Favril et al., 2020), and therefore attendance to prisoner wellbeing is of value in addressing this problem.

One route through which prisoner wellbeing is supported is through the opportunities for prisoners to maintain relationships with friends and family, as highlighted by a systematic review of research on the impact of prison visits (De Claire & Dixon, 2017). This is consistent with increasing understanding (though not always appreciated) of the value of identity-based social connection to both physical and mental health (Haslam et al., 2018). A vast array of health and wellbeing outcomes in clinical, community, and applied settings have been shown to relate to psychologically meaningful social relationships with groups. This is characterised by a sense of social identification and belonging to family, friends, colleagues, support groups, and hobby groups (Haslam et al., 2018; Jetten et al., 2011; Sani, 2012; Wakefield et al., 2019). In an early review of the prison-based literature, Hairston (1991) reported further benefits of enabling contact with family and friends to be reduced recidivism and improved mental health both for prisoners and their families. Security restrictions within prisons are one of the barriers to such contact. Computers in prison cells may provide an innovative way to minimise the impact of these security barriers, through allowing direct and instant messaging between prisoners and their friends and family. They further provide the potential for easing the mental strain of prison, as described by Syke's (1958) pains of imprisonment, through productive use of prison time. These effects have not been empirically explored and the

current study will seek to understand if these potential relationships are part of the experiences of prisoners provided with in-cell computers.

The Current Study

Computers are being introduced into some UK prisons and elsewhere across the world, with hypothesised benefits to agency, procedural justice, relationships, and wellbeing (Barkworth et al., 2022; Champion & Edgar, 2013; McDougall et al., 2017; Thaler et al., 2022). There are significant financial costs involved in investing in this technology, in addition to ethical questions relating to moving from a human to a computer interface between staff and prisoners. Chapter 3 reported a study which explored computer use and found relationships between frequency of use of the computers and two outcome measures of agency for desistance and wellbeing. The current study sought to build on these findings by exploring the prisoner experience of having access to computers within the prison cell through the following questions:

1) How do prisoners find the experience of living with an in-cell computer?
2) What are the positive and negative experiences associated with living with an in-cell computer?

Method

Design

As discussed in Chapter 3, this study formed the second part of a sequential explanatory mixed method design (Creswell, 2017). The qualitative approach to the current study allowed explanation of the quantitative findings and served to triangulate the data to increase confidence in the overall policy recommendations. This approach is valuable for comparing and contrasting data from qualitative and quantitative studies, providing a process to corroborate findings from quantitative data with explanatory qualitative sources (Creswell, 2017). It also provides a route to

understanding the wider context from which the quantitative data was collected, through which to interpret the findings.

Participants

Participant Selection

Non-probability sampling methods were used to select participants for the study. Although these methods increase the risk of selection bias, this approach was decided on for two reasons. Firstly, it was consistent with the exploratory qualitative nature of the research design. Secondly, for practical reasons, a non-probability approach was less disruptive to the daily regime of the prison. This approach avoided withdrawing prisoners from planned activities that may benefit their progression or requiring staff to escort prisoners from different areas of the prison. A non-probability sampling method also allowed on-the-day flexibility to avoid selection of participants from areas of the prison where COVID-19 rates were high. Consequently, the approach taken involved convenience sampling. The researcher based themselves in different areas of the prison and prison staff identified which prisoners were currently available and could be approached to ask if they were interested in participating in the study. Participants were approached across several locations at the two prisons, to increase the variety of prisoner experience at the prison, such as length of stay and experience of work. Participants included in the study were at work, in training, at the offender management unit, in the chaplaincy, on their residential unit or in the pre-release area. The researcher had planned to interview between 12-15 participants to enable a robust reflexive thematic analysis (Braun & Clarke, 2022).

Participant Characteristics

Participants for the study were adult men living at two category C prisons in England and Wales (coded as Prison One and Prison Two respectively and described in Chapter 3). The prisons were selected because they were the first sites within HM Prison and Probation Service (HMPPS) at

which in-cell computers were introduced and therefore participants would have had opportunity to have experienced living with an in-cell computer in a business-as-usual environment. This is important given McDougall et al. (2017) found that some of the initial effects following kiosk (wing-based computers) diminished over time. A total of 13 interviews were completed. Participants were asked to provide details of their age, the time spent at the current prison, and time served on current sentence. Details of this information is displayed in Table 4.1. In addition to currently living with access to an in-cell computer, all participants had also experienced prison (on the current sentence or a previous sentence) without an in-cell computer. Participants included both sentenced and remand prisoners. Table 4.1 provides relevant details of the participants' characteristics.

Table 4.1

Description of Study Participants

Identifier	Prison	Age at interview (years)	Months spent in current prison	Months spent in prison on current sentence
P1	1	43	60	162
P2	1	57	36	114
P3	1	42	12	35
P4	1	24	36	40
P5	1	35	60	84
P6	1	37	14	30
P7	2	44	60	114
P8	2	48	60	60
P9	2	47	17	180
P10	2	39	1	6
P11	2	32	<1	8
P12	2	33	<1	2
P13	2	61	60	114

Procedure

Interviews took place in private rooms or booths within each prison and were between 12 minutes and 53 minutes in length. Discussion was held with each potential participant prior to the start of each interview, to explain the purpose of the study and to talk through the participant information form. A semi-structured interview schedule (Appendix G) was used to guide the

interview, based on the review of the literature and initial findings of the study reported in Chapter 3 and designed to address the research questions. Interviews were audio recorded on an encrypted Dictaphone. Once the interviews were completed, the researcher discussed with the participant how they were feeling, talked through the debrief sheet, and provided a copy of the debrief sheet for the participant to take away. The interviews were later transcribed by the researcher, removing potential identifying information during this process. Notes were made immediately following the interview process to record the researcher's observations on the interview process and content.

After two interviews had been completed and transcribed, the researcher reviewed the transcripts, adding a column within the transcript table, for reflections on specific questions and approaches which appeared to have been helpful in opening the conversation to particular areas. The researcher consolidated this column into guidance notes which were used in later interviews in addition to the semi-structured interview. At this point, the researcher shared these initial transcripts with their supervision team, to seek additional advice relating to the effective structuring of the remaining interviews, for example, the inclusion of further follow up questions. The remaining interviews were then conducted following the process described above.

Analytical Approach

The study of in-cell computer use within prisons is at an early stage in relation to the literature base, therefore a predominantly inductive coding approach was taken given the explorative nature of the study. The findings from the quantitative study reported in Chapter 3 were also used to inform the analysis, and therefore some elements of the coding were deductive. A philosophical position of critical realism (Maxwell, 2012) informed the analytical process and consistent with this, a contextualist epistemological approach was taken towards the data, with the researcher position and the participants' context being integral to the interpretation of the data and the generation of themes (see Braun & Clarke, 2022). A contextualist approach was valuable in this study, as it allowed both the words of the speakers (the prisoners being interviewed) and the

context from which they were speaking (the prison context) to be incorporated into the analysis (McKenna, 2015). Given the background to the research, exploring the meaning for prisoners of access to in-cell computers, where the literature base is limited, and the need for policy steer is pressing, this approach allowed a pragmatic extraction of meaning from the data. The research question was also curious as to how in-cell computers were experienced by prisoners and therefore a phenomenological methodology was applied.

Reflexive thematic analysis (Braun & Clarke, 2022) as distinct from other types of thematic analysis, some of which draw from a positivist or post-positivist position (Guest et al., 2012; Joffe, 2011), is a flexible method, suited to a contextualist approach and was selected as the method to analyse the data. The method describes six phases which though followed sequentially, can be returned to during the process. These are displayed in Table 4.2

Table 4.2

Phases of Analysis

Phase of analysis	Process followed during phase	Examples of codes and themes (*with descriptions of how the phases developed towards the final findings*)
Phase 1: Data familiarisation	This began at the point of interview and was assisted by the researcher completing verbatim transcription of the interviews. Following this, a process of reading, taking time away from the data, re-reading, re-listening, and making notes enabled familiarisation with the content.	N/A
Phase 2: Generating initial codes	This was done through annotation of tables in electronic Microsoft Word documents with codes added in a column adjacent to the transcript. Initially, the data relevant to the research questions was largely coded semantically, with latent codes being added as	Speed of email process Manage your own time Photos enable family connection

Phase of analysis	Process followed during phase	Examples of codes and themes (*with descriptions of how the phases developed towards the final findings*)
	the researcher returned to the data.	
Phase 3: Generating initial themes	For this phase, the coded data was moved to the computer software package NVivo to assist with organisation and management of the data. The researcher reviewed the aggregated codes, collapsing codes where needed and beginning to identify themes representing the data.	Communication with others Connection with outside Feelings of control and autonomy
Phase 4: Reviewing themes	During this phase the researcher reviewed the themes, considering if they were in fact codes or themes, and considering the quality of the themes in relation to the research questions.	Managing relationships with family and friends (*this theme was developed from the initial theme of "communication with others", at Phase 4 the theme included the quality of the relationships with friends and family, rather than the initial focus purely on ease of communication)* Confidence and trust in the prison processes (*this theme was developed from the codes around managing own time, and initial codes of feelings of control and autonomy. At Phase 4 the theme included the way that the control of processes influenced wider feelings towards the prison environment, relating to trust and confidence*)
Phase 5: Naming the themes	During this phase the researcher drafted initial descriptions of the themes, reviewing these descriptions relative to each of the other themes and considering the wider story that was being developed. Theme names were developed, shared, and discussed through a presentation to supervisors to check that they	Living outside from the inside (*at Phase 5 the theme name captured the experience for prisoners of having a greater sense of the outside world and being integrated within the events outside prison through the real time computer access. This built on the findings reported in Chapter 3, in which*

Phase of analysis	Process followed during phase	Examples of codes and themes (*with descriptions of how the phases developed towards the final findings*)
	communicated the intended conceptualised meaning, and were adapted where required. The researcher moved back to phases 3 and 4 to revisit codes and themes at points during phase 5.	*support from others was a mediator in the relationship between computer use and both wellbeing and agency for desistance*) A hand on the steering wheel (*the name for this theme developed from the reported experience of control. At Phase 5 this was developed to encompass the positioning of the prisoner relative to this control over their prison sentence and their outcomes on release*)
Phase 6: Writing the report	This phase involved the current process of writing up, using this phase as an additional opportunity to refine the themes and descriptions.	N/A

Reflexive Considerations

Throughout the six phases described above, the researcher position in generating and developing the codes and themes was recognised, as is consistent with the philosophical position taken. During the analytic process the researcher kept notes, observing initial thoughts on the interviews, possible themes, and the influence of the line of questioning taken by the researcher. This enabled the researcher to note elements of interest within the transcripts, including unexpected insights. The researcher has a history of working within prisons and is interested in the technologies emerging within the forensic field. This position is acknowledged to be part of the analytic process and potentially contributed to the themes generated from the data. The researcher's career to date has focused on interventions to support prisoner rehabilitation and to develop rehabilitative prison environments. This history will likely have influenced the direction of

the interview questions and the later interpretation and analysis. As an employee of HMPPS, the researcher brought a position of power to the interactions which may have influenced the participant responses. For example, the researcher noted that at times in the interviews, possibly because of the researcher's status as a member of staff, participants requested that the researcher attempt to change aspects of the computer functionality (for example, requests to enable video visits within prison cells). It is possible that the data collected was therefore influenced by this dynamic in a way that may not have occurred had the researcher been independent of HMPPS. The researcher explained to participants their role within the research, and that while the aggregated results would be shared with policy makers, they did not have a direct role in policy implementation, however the potential effect is noted.

The process of analysis involved a recursive back and forth process, using the research questions as a rudder to focus the data analysis on pieces of data of relevance. As the analysis progressed, codes and themes generated changed from relating to individual or pairs of transcripts to broader meanings generated across the full data set, as illustrated in Table 4.2.

Ethical Considerations

Approval

A research proposal was given favourable opinion by Nottingham Trent University Research Ethics Committee (27/10/21) and by HMPPS National Research Committee (04/09/21). The British Psychological Society code of Human Research Ethics (British Psychological Society, 2021) was adhered to throughout the study.

Participant Consent

An information sheet was provided for participants (Appendix E), the content of which was discussed verbally with participants to ensure that consent given was valid and not inhibited by reading ability or cognitive ability. Participants provided a signature to confirm consent, which was

securely stored following the interviews. Participants were advised on the process for withdrawing from the study during the data gathering phase and were provided with a debrief sheet (Appendix F) to ensure that this information was available to them following the interview. Participants were advised that the anonymised data could be stored securely for a maximum period of ten years.

Safety

The research involved face to face contact between the researcher and the participants, at a time when COVID-19 restrictions were in place within prisons. Steps were taken to minimise risk of infection, through use of large interview rooms, wearing of masks and pre-interview testing. At points in the research, interviews did not proceed on the planned date due to high levels of COVID-19 within the prisons and were postponed until a time when the rate of infection had lowered.

Although the focus of the interviews was not anticipated to evoke strong emotions for participants, there was a risk that topics discussed may trigger memories or ruminations of concern for the participants. Participants were given an opportunity to halt the interview at any time and to discuss how they were feeling at the end of the interview. Any concerns for prisoner wellbeing were passed to prison staff.

Analysis and Discussion

The results of the analysis and the discussion have been combined in the following section, to allow the data to be analysed while drawing on insights from the extant literature. The themes and sub-themes which were identified through the Reflexive Thematic Analysis process (Braun & Clarke, 2022) are displayed in Table 4.3. An explanation and discussion of each of these follows, using excerpts from the data[12].

[12] Quote conventions used:
… in the quote indicates the removal of a section which did not play a part in the particular purpose of the quote selection.
[text] refers to additions by the researcher to describe non-verbal elements of the quote which are not captured through the written transcript.

Table 4.3

Themes and Sub-Themes Generated Following Reflexive Thematic Analysis

Themes	Sub-themes
1. Making good use of my time	1.1 An end to the digital deep freeze of prison
	1.2 Small steps for big journeys
2. Staying connected when the door closes	2.1 Living outside from the inside
	2.2 A direct line to the right department
3. Coping with cell-time	3.1 A watched clock never moves
	3.2 Easing stresses and prison strains
4. A better place to live	4.1 A hand on the steering wheel
	4.2 Trusting the ground you're standing on
	4.3 Lean on me
5. Rage against the machine	5.1 It's a computer, it should be instant
	5.2 It's gone down!

Theme 1: Making Good Use of My Time

This theme relates to the opportunities that participants perceived were available to them through the computers at the prison. The first two words of the theme name: "Making Good" references the book by the same name (Maruna, 2001). A key text within the desistance literature, which highlights the role of identity development and internal change within pathways to desistance. Access to the computers enabled participants to feel that they were taking actions that led to growth and development during their sentence, relative to a stagnation without computer

access. Two sub-themes are described as part of this wider theme, “An End to the Digital Deep Freeze of Prison” and "Small Steps for Big Journeys”. These are described further below.

Sub-Theme 1.1: An End to the Digital Deep Freeze of Prison

As discussed in Chapter 1, the pace of change of technology in the community and the impact on everyday living has been significant over the last two decades. Prisoners released today after serving long sentences have considerable adjustments to make, for example in relation to use of smartphones and the internet to manage shopping, banking, benefits, entertainment and much more.

Participants referenced the “alien” nature of the outside world relative to their non-digital lives in previous prisons. Technology appeared to be an additional marker of the separation between prisoners and non-prisoners and served to accentuate the difference between these groups. One participant described the risks of being left behind in terms of technological knowledge needed to manage life on release:

> My best friend when he gets out, he won’t have a clue ‘cause he’s doing 28 years before he can put in for a parole, so he’s not going to have a clue … there’ll be flying cars by the time he gets out. (P10)

Another participant, who had been released and then returned to prison, described re-entering a community in which smartphone use had leapt forward during the period that they had been in prison. For people living in the community, these adjustments occur at a pace that while noticeable is less shocking, as the changes are incremental, and people are often participating or at least directly witnessing the changes. To leave the community without smartphone use and to return to one where smartphones have become normalised however is more akin to time travel and requires psychological adjustment.

> The first time I got out on this sentence, went to the train station, got on the train. Everyone was doing stuff like that [makes actions with hand as if on a smart phone], we never had phones like that. (P9)

This digital separation from the outside world, adds to the challenges of reacclimatising with the community on release. Liem and Kunst (2013) described the commonly experienced psychological symptoms following release from prison, termed Post Incarceration Syndrome. One experienced symptom was that of social alienation, linked to released prisoners' observations that they feel they do not fit in the world that they returned to. Stark differences in access to digital technology between the community and prison environment adds to this feeling. In contrast to this divide, participants' accounts suggested that access to computers in prison exposed participants to the same technological changes occurring in wider society, normalising the experience of using computers to manage day to day life. For some participants this was their first direct exposure to computer use, empowering them to participate in the digital world.

> When I get out, I know more stuff about it, whereas before I never knew much about the computer stuff, how to use it properly. And I had to get my daughter in to do it … so, I didn't know how to work it, but now I know how to work it a bit better. (P3)

As the quote from P3 above illustrates, their experience of time in prison has changed from being a 'deep freeze' for digital skills to a setting where an interest in technology is seeded, and confidence to engage independently with technology grows. This is critical because computer access and digital literacy in the community can provide access to information, work, and knowledge, so a lack in these skills can potentially lead to social exclusion and inequality (Helsper & Reisdorf, 2017; Ragnedda et al., 2022). Use of a computer as a day-to-day part of life within prison, was felt to normalise technology use and P3 now identified as a technology user, anticipating this to be part of his future. While technology use in the community has expanded rapidly, it is known that there remain sections of society where digital use is lower. In 2021, 6% of homes in the United Kingdom did not have

internet access with 60% of non-users being described as ‘proxy users’, that is they were reliant on others to make online transactions for them (Ofcom, 2022). Those from lower socio-economic groups, a group over-represented within prisons, are more likely to be non-users of the internet (Office for National Statistics, 2020). Within this group it is less likely that individuals will be exposed to technology use through observing use by others that they identify with. In contrast, in the prison environment, every prisoner, behind every door is using a computer, providing increased opportunities to informally learn from others, and an expectation that accessing information via a computer is a normal process. This is different to computers being available to access in the education department or the library (as is the case in other prisons), where those who pre-prison identified as non-users of computers would be less likely to visit for this purpose. With in-cell computers, prisoners were using the technology routinely and frequently, as shown in P8’s comment below:

> A lot of lads they’ve probably never used a computer to the extent that they are doing now, as well, so it’s good, it’s good learning for them really. (P8)

The in-cell computers were provided for all prisoners, and there was no formal training course offered prior to allocation. Participants referenced the informal nature in which they explored the computers as a result, and their familiarity and increased confidence with use of computers after living with the devices. P13, an older prisoner, who had served a substantial sentence, initially stated in the interviews that he was “not that interested” in the computers. As the interview progressed, he mentioned several uses that he depended on the computer for, and described his increased competence and confidence in their use, towards the end of the interview he commented:

> It’s all learning, like I’ve learnt how to mess about on the computer, you know, to do bits and pieces … no, the computers are absolutely brilliant things, without a doubt. (P13)

It appears that the informal opportunity to “mess about” on the computers, without a particular purpose, led to a confidence that a formal course within an education department may have been

less likely to achieve. P13's comment shows that the routine and informal manner of using a computer, without pressure of time and within a private space, removes the barriers that he had previously experienced to access technology. While P13 did not identify as a computer enthusiast, he now had competence and agency to use the computers when he wished for the purposes that he chose. This ability to choose how and when to engage with technology allowed for participants' anticipation of future use of technology, even for functions not directly available in prison, such as online banking:

> Interviewer: Did you do online banking before you came to prison?
>
> P3: No
>
> Interviewer: Would you do it outside now?
>
> P3: I probably would now yeah. Because I know how to do the computers now a bit better.

This sub-theme captures the effect of routine and normalised access to computers on prisoners' identification with being a "computer user". Through access to an in-cell computer, prisoners informally grew their competence and confidence in engaging with technology and anticipated a life outside prison which involved computer use. Prison was no longer experienced as a deep freeze for digital skills, rather, those participants who entered prison as digitally excluded felt they were leaving with agency to make use of technology in the future. Just as the findings of the study reported in Chapter 3 found a relationship between computer use and agency for desistance, in the current study participants explained how they experienced this emboldened attitude towards technology because of their routine access. The advantages that the computers conferred was acknowledged by all participants, who when asked, all stated that they thought computers should be available to all prisoners. The support for rehabilitation was not limited just to digital confidence,

participants also talked about other ways that the computers supported their future lives, these are discussed in the next section.

Sub-Theme 1.2: Small Steps for Big Journeys

One of the purposes of prison is to rehabilitate, that is, to encourage reflection and action on the part of the person in prison, to reduce the likelihood of reoffending on release (Mann et al., 2018). This sub-theme refers to ways that the computers appear to have increased access to information and nudged participants' attitudes away from offending. None of the participants described this access as a turning point in their rehabilitation. Instead, they pointed to small daily opportunities that the computers provided for growth or change.

One pathway towards rehabilitation described by participants related to access to future employment. Participants described how they were able to view employment opportunities directly from their cells and could browse through these in their own time. This ease of access, with the opportunities arriving directly in participants' cells, planted the idea of considering employment opportunities, which may not otherwise have been a consideration:

> well on the thing [in cell computer system] … they're always having it pop up for job applications, for when you go out. I don't normally look at that sort of thing, but I've seen a couple of jobs in [nearby city] and you can apply for them. (P11)

The study in Chapter 3 found a link between use of the computers and an environment where growth could take place. The above quote from P11 provides insight into how the computers are leading prisoners to feel that they have access to opportunities that will help them on release. Finding employment is a protective factor against reoffending (Laub & Sampson, 2001). In a prison without computers, accessing job advertisements and applying for jobs from prison generally involves going to an employment department to seek out information. The in-cell computers

smoothed access to employment information for participants, providing ideas for employment without participants needing to actively seek it out.

Another pathway away from reoffending described by participants was that of education. As the interviews for the study took place between April and July 2022; many of the participants had experienced restrictions in their time in prison because of COVID-19, involving increased periods of time within their cell. This had limited their access to departments such as education and training, and some participants expressed gratitude that they were in a prison with a computer in their cell to enable them to continue to access studying opportunities:

> I was actually thanking the gods that I'm in [current prison] because there is something to do, and I was still able to proceed, I was able to email the education department. I actually did my…, I study with the open university. (P2)

Computer access had enabled P2 to take control of his education and direct his own pathway following release. Other participants had not used the computers for study themselves but were aware that this was something that could be accessed:

> I know people that are interested in them that are on them all the time, they're always doing stuff on the computers, they can do their courses can't they, they can do the cell courses and things like that. (P13)

P13's quote above references the convenience and the expanse of opportunities that the computers offered but also that computers had become integral to the life of the prison, such that people were "on them all the time". The locating of the computers within the prison cell is significant in this observation, it is not just the content and functions of the computer being described but the availability of access. The value placed on access from the prison cell was a finding from the content analysis in Chapter 3, participants in the current study explained why this was important in relation to their future prospects.

The content hub, an intranet-like area on the in-cell computers, includes stories and testimonies from people who have previously been in prison. Several participants described watching this content and being influenced by it in a positive manner. As well as passively watching, prisoners can actively engage by submitting comments about the videos and articles which can be seen by staff. P5 held a prisoner role supporting the digital team and was able to view the comments submitted, he described the type of comments he had read:

> So, these are really personal testimonies, and some of the feedback we've seen under those videos, for instance, "I was going to make a stupid decision", or "this reflects a lot of my own life", "this has been a huge inspiration". (P5)

P5 notes the benefits of the relatability of the content, prisoners identified with the inspirational narratives, which involved managing life's challenges and success stories. Holding anti-social attitudes is a risk factor for future offending (Andrews & Bonta, 2010). P5 describes how the testimonies provide a relatable alternative example, which prisoners were following to lead them away from destructive behaviours.

Through this sub-theme, participant comments showed the habitual influence that in-cell computers were having on behaviours and attitudes. Participants did not describe dramatic revelations or single pieces of content which changed their lives; instead, the presence of the computer and the varied content contributed to an environment supportive of growth towards their futures.

Theme 2: Staying Connected When the Door Closes

While undoubtedly exacerbated by the restrictions during the COVID-19 pandemic (User Voice, 2022), even in non-COVID-19 times, prisoners spend a considerable section of their day within a prison cell. In prisons without an in-cell computer, there are several ways that time can be spent within the prison cell, for example, exercising, reading, watching television, writing, chatting with a

cell mate if in a double cell. One option not available to most prisoners, however, is to interact with people outside of their cell.

This theme built from participants' comments around how the in-cell computers can provide a key to virtually open the cell door, enabling access to others outside the cell, both inside and outside of prison. The interviewees' accounts suggest this alters the dynamic, nature and quality of their relationships with others during a prison sentence. Two sub-themes fit within this overall theme, the first relating to relationships with family and friends outside prison, "Living Outside From the Inside", and the second relating to relationships with those inside prison, "A Direct Line to the Right Department".

Sub-Theme 2.1: Living Outside From the Inside

This sub-theme unfolded from participants' discussion of the impact of access to the email facility through their in-cell computer. The difference between this facility at prisons with and without in-cell computers is that the messaging is sent directly to the prisoner rather than through a member of staff who prints the email out and takes it to the prisoner's cell. To reply, the prisoner simply responds directly via the computer, in place of writing on a piece of paper, which is passed to a member of staff and scanned in to send back to the recipient. Participants described how this altered their experience of loneliness and isolation while in prison.

> So, if I thought, what is the worst part of incarceration for me? One is the separation from your family, and another one is that obviously you're restrained – you can't go out and do what you would normally do. And the other one would be that I'm being locked up and isolated. So, the separation from family, that is like a lot less, because you have much more contact, and also, you're not as isolated. So, for me, it takes the sting out of the punishment. And it sort of focuses on what the punishment is really about. (P2)

In the above comment, P2 raises the purpose of prison, for him, prison conditions which include the blunt punishment of impaired contact with family detract from the effectiveness and perceived purpose of the sentence. His ability to remain connected with his family afforded him the mental space to process his sentence and increased his perception of the validity of the punishment. The comment echoes Syke's (1958) pains of imprisonment, which when experienced by prisoners have been found to link to prison misconduct (Rocheleau, 2013). Indeed, the observation mirrors Liebling and Maruna's (2013) identification of the gap between the effects of imprisonment and the objective of rehabilitation and desistance. In this case, the in-cell computer reduces these pains to an extent, while retaining the purpose of the institution. Since Goffman's (2017) proposal of prisons as a total institution, in which all aspects of prisoners' lives are controlled by the prison, there has been discussion about how connected prisons are with the communities from which they arise. Ellis (2021) highlights the problematic position of supposing that prisons can realistically be separated from the communities in which they sit, given the porous nature of the walls evident through deliveries, community groups visiting, and staff moving in and out. P2's comment above provides a further counter to prisons as a total institution, supposing that punishment can be achieved through containment without the need for accompanying isolation.

Participants also described how the in-cell computer enabled their communications to be normalised, that is, they were able to communicate in a manner more analogous to that used outside prison. They noted that as the messaging was closer to instant, they were included in more incidental information from friends and family and as a result felt a greater connection with how life was progressing outside prison. For example, P6 observed "Since I've been here my Mum's been quite surprised at how fast it is. She quite likes it 'cause she knows we can have a quick conversation over a quick email". In this comment, P6 refers to the "conversations" that he has using the email system, indicating a back and forth between himself and his mother. The nature of the contact, and therefore the content of the discussion is experienced very differently for both parties compared to a non-synchronous system such as letters or printed emails. In addition to the speed of the system,

participants explained that normalisation was also supported by the familiarity of the process for some of the prisoners who were accustomed to texts and electronic messages outside prison. P7 pointed out: “The good thing about the email is it’s just like a text, it’s just straight on there you know what I mean”. Linking with sub-theme 1.2, “An End to the Digital Deep Freeze of Prison”, P7 has highlighted the digital pathway that he is able to follow in prison, is a closer parallel to that being followed in the community, potentially supporting an easier transition to community life on release.

In a study of the type of activities that families in the community report as being quality family time, Kremer-Sadlik and Paugh (2007), identified that it is unplanned mundane aspects of life, such as sharing family chores, which offer the greater opportunities for quality interactions. Participants in the current study commented that email interactions, enabling quick message exchanges, via the in-cell computers enable prisoners and families to engage in sharing more mundane moments. In doing so, prisoners retain a position and role in family day-to-day life, enabling belonging within the family and reducing the barriers to returning to the family group on release. The study in Chapter 3 found links between use of the computers and wellbeing, comments from participants in the current study provide insight into the benefits of wellbeing that prisoners experience.

In addition to the timeliness of the email system via the in-cell computers, the quality of the information shared was also enhanced due to the option of family and friends sending photos. While this was an option in prisons without computers, in those settings photos were printed out in black and white to hand to prisoners. On the in-cell computers they arrived directly onto the computers, could be viewed in colour, and could be safely stored. Participant P4 described the impact for him of receiving photos from family members and knowing that he was being kept in mind despite not being physically present: “Well it’s important because they haven’t forgot about me. You know, it’s nice and they give me reminders that they’re going to be waiting for me. It’s nice to know that you’ve still got family.” The possession of a photo provided P4 with a meaningful symbol of his

position within his family, a proxy measure that he was cared for and valued, and provided assurance that he belonged in the family group. Warr (2016), writing from his experience as a prisoner and a criminologist described the separation felt by people in prison from life outside as "that of a voyeur peeking over the walls at the lives that play out on the other side" (p595). P2 reveals the process by which access to photos increases the permeability of the prison walls, even bringing prisoners virtually inside the homes of family and friends outside the United Kingdom:

> Lots of people who don't speak any English or are displaced. Like they have no family or friends in this country. And for them it is like a God Send because they are like emailing people in Iran, or wherever they may be from, when they have no chance of ever seeing them. But they get photos sent through, they come straight away on the screens, so that's like a really big aspect for them. (P2)

P2 explains that they are no longer "peeking over the walls" (Warr, 2016, p595), rather they have a virtual seat in the living room of their family and friends. Participant P13 described the normality of receiving photos via email, his description could have been a comment from any Grandparent in the community, demonstrating how the email access on the computer had facilitated a change in the nature of the relationship he was engaging in with his Grandchildren: "Yeah it's just nice to get a little email now and again, and you get a picture don't you of your grandkids and stuff. Yeah. It's nice." Although physically separated, the ability for family members to easily share photos with P13, assured him of his role as a grandfather, and enabled him to keep in step with the changes happening for his grandchildren.

Participants also commented on the lack of temporal restrictions that came with email, each person in the communication can reply at a point in time convenient for them. In contrast to a phone call in which there may not be a mutually convenient time for both parties to hold a conversation, email allowed people to respond at a chosen time. This was recognised to be helpful when family or friends were working at times when it was convenient for the person in prison to call

or when family and friends were living in a different time zone. Email also afforded the advantages that mail provides, of considering and re-reading words before they are sent relative to the one-chance nature of communication via telephone, without the slowness of physical mail:

> I've got a lot of family abroad, and I communicate with them via email most of the time. Calling them is more expensive, so email is, it's also a better way to say something, that you can plan, rather than saying something spontaneously you might actually not come across as well as if you had written it, so it's a good way of communicating. (P2)

Even with access to the technology, prison reduces the number of exchanges within interactions, P2 highlights the increased weight of responsibility that this places on getting the tone of the message correct. The email process provided him with confidence that his message communicated what he had intended, providing peace of mind as to how it would be received. He feels in control of the impression that he is sending to the recipient.

This sub-theme represents how the in-cell computers allow prisoners to permeate the barriers to retaining their family position and belonging. Maintaining good quality relationships with family outside prison has been found to be protective against later recidivism (De Claire & Dixon, 2017; Sampson et al., 2006). As Farmer (2017) highlighted in a review of family ties within prisons, relationships with family allow prisoners to develop their identities as role models to their children, caring partners, or friends. The development of such identities leads prisoners towards desistance (Maruna, 2001). The importance of this relationship is such that support for maintaining relationships is a recognised pathway within HMPPS and a mandatory element of the regional reducing reoffending plans (HM Prison and Probation Service, 2022). In a prison without in-cell computers, contact with friends and family is typically through in-person visits, video facilitated visits, telephone calls or paper-based letter / email writing. While each of these methods enables communication between the inside and the outside, the regular dynamics of relationships are impacted by either the limited time available in the interaction (for example, visits are limited by the

time assigned by the prison and telephone calls are limited by the amount of money that a prisoner has to spend on the call) or by the time lapse between each segment of the conversation (for example, when letter writing or using the paper based email process). Telephone calls are also often made via a wing telephone, affording limited privacy. Such barriers inhibit the amount of information that can be communicated as well as the lack of synchronisation with events that are taking place, typically prisoners or their families will receive information on an event after it has happened. Palmer et al. (2020) noted the increase in reported feelings of privacy following the introduction of in-cell telephones, the current study found a similar experience for prisoners with access to in-cell computers.

Sub-Theme 2.2: A Direct Line to the Right Department

The relationship between prisoner and prison officer is a topic of interest within criminology and forensic psychology, acknowledging the importance of the most frequent human contact that people in prison have during their sentence, and the potential for the quality of this relationship to influence the outcome of the period of incarceration (Crewe, 2011; Liebling et al., 1999).

This sub-theme, under the overall theme of "Staying Connected When the Door Closes" illustrates that this enhanced connection is not just with those outside prison but also with people inside the prison walls. In contrast to sub-theme 2.1, this type of connection is more likely to be for professional or transactional purposes, such as to exchange information with an offender manager, or to request an appointment with psychology or healthcare. The sub-theme was demonstrated through three types of participant accounts, the reduction in the need for officers to peace-keep, the readiness of prisoners to manage their own tasks and the avoidance of distortion that a direct message provided.

Referring back to their experience of prisons without in-cell computers, participants frequently cited the dependence that they had on officers to carry out tasks on the prisoner's behalf, and the resulting friction that this could lead to in the relationship between them. In contrast, by

providing prisoners, through the in-cell computers, with the ability to directly message departments, there was reduced need for the prison officer to mediate or intervene on their behalf. The prisoners described how this freed them from the burden of entering a dynamic with officers which could be perceived as nagging or pestering, an approach they considered necessary to get tasks done but did not enjoy. P2 summarised the adjustment in prisoners' approaches towards prison officers:

> I think it takes some of the pressure off the relationship, like I said, I'd be hassling the officer to find me this information so the more that you can do yourself, the less there is the pressure on the officers. (P2)

The central role of the relationship between officer and prisoner in prison culture was highlighted by Liebling et al. (1999) in an appreciative inquiry of prison officer and prisoner reflections on the officer role, identifying one element of the role as being peacekeepers. When performing the peacekeeping role well, officers diffused tension between prisoners and avoided conflict, in Liebling et al. (1999) this was recognised by both officers and prisoners as leading to a positive environment, though the toll on the officers was noted. P2 illustrates how the in-cell computers reduce the need for peacekeeping by officers through enabling direct access to other departments in the prison:

> You're taking some pressure off them and also, you're giving direct access to the person you actually ought to be complaining about. Prisoners sometimes get depressed or frustrated that they can't moan at anyone, so they moan at the nearest person there is – and it's usually their wing officer. (P2)

Lifting the necessity of having to go through Officers to get things done provided prisoners with an option to be more independent and to behave in ways more consistent with their values. P2 was conscious that there is a person that he 'ought to be complaining about' and that the in-cell computer avoids a wing officer unfairly bearing the brunt of the complaint by providing P2 with an alternative option. There was also some empathy for the number of requests that officers received prior to the in-cell computers, and a recognition of the strain that this created in the system:

> Yeah – the stress it must take off them. Cause they're the ones who have to deal with the written applications, make sure it gets to the correct department, and if we're doing it ourselves, that takes all the work off them to do what they have to do, something which is useful I suppose. (P6)

It is in the interests of both prisoners and prison officers that prisons operate effectively. Without in-cell computers, prisoners have little power to reduce the pressure on wing staff. The in-cell computers present a unit full of seemingly willing extra pairs of hands to support the workload. In addition to the positive impact that participants recognised for the officers, there was also recognition of the positive impact for prisoners in being able to circumvent officers to carry out tasks on their behalf:

> The frustration aspect of being in prison is one of the most challenging aspects of being inside, so when in the past you'd have relied on a member of staff to process an app, or sign something off, or get in touch with another department for you, all of that frustration is taken away in that you can handle all of the administration side of your existence here through your laptop. It's quick, there's normally a paper trail, so in terms of communication and being independent, it's absolutely massive. (P5)

P5 refers to the emotional weight that is lifted through the independent way of working that the in-cell computers allow. The study reported in Chapter 3 found that prisoners appreciated the self-sufficiency that the computers provided them with. Participants in the current study talked about how they valued the independence and agency that the computers provided relative to being reliant on a busy group of officers.

Participants also described an increased assurance in the prison processes because of the in-cell computers, for example, they were more confident that their message would reach its intended recipient without distortion:

> Um, I also think that you don't get your messages put through the filter of a prison officer, which sometimes will distort what you've asked, or a different question will be asked to the one that you generated in the first place. If you can communicate effectively yourself, um, in your own words, I think that's a massive plus. (P5)

If prisoners in prisons without in-cell computers are reliant on a system akin to sending messages third or fourth hand with the risks and lack of confidence this leads to, P5 experiences the reassurance of a clear crisp line to the recipient through the in-cell computers. Misunderstanding and confusion is avoided. Collectively, assurance and confidence that prison systems will operate effectively contributes to the feeling of a procedurally just environment (Fitzalan Howard & Wakeling, 2020). This is critical not only to the effective functioning of the prison, but also to success on release. Liem and Kunst (2013) highlight that prisoners experience poorer wellbeing outcomes after their release if they perceive their detention to have been unjust.

This sub-theme reflects the adjusted staff prisoner relationship brought about by the opportunity for prisoners to directly contact other departments in the prison. The peace maker role, operationalised by officers to create a positive environment, was required less frequently as prisoners had reduced need to make demands on officers. Providing participants with the tools to manage their own lives and directly contact the departments in the prison who could assist them, had benefits both for the prisoner in terms of providing agency to facilitate solutions to their own problems, and for the officers who had previously been subject to high levels of requests to be an intermediary in tasks.

Theme 3: Coping With Cell Time

This theme reflects participants' comments describing the in-cell computer as a helpful tool to manage tedium and stress linked to stretches of time in prison. Medlicott (1999) interviewed prisoners in England and Wales assessed as at risk of self-harm, to explore how they perceived and managed time in prison. They concluded that one of the pains for these prisoners was that

"prisoners must live to prison time, unable to choose freely how to spend any time inside" (p226). This theme, "Coping With Cell Time", shows how the in-cell computers provide a freedom to choose how time is spent, and in doing so ease the burden of monotony and time management. While time and routine can be challenging across prison life, this is accentuated by increased time spent locked within a prison cell. A recent study exploring the effects of the COVID-19 pandemic, during which most prisoners spent more time locked in their cells, found levels of anxiety and depression among prisoners increased (User Voice, 2022). Two sub-themes form part of this overall theme, "A Watched Clock Never Moves" and "Easing Stresses and Prison Strains".

Sub-Theme 3.1: A Watched Clock Never Moves

This sub-theme refers to participants' observations of how they used an in-cell computer to help manage time spent within their cell. Participants referred to the tendency for thoughts to become pre-occupations during their time in cell, on these occasions, an alternative occupation for their minds assisted with managing ruminations that could be accompanied by negative emotions. Computer use at these times was consciously initiated despite the participant not having a functional task to complete, providing a comforting source of distraction:

> Well, we have a lot of free time actually. Say I don't know, you might start ruminating about something. Or whatever it may be, there may be other stuff going on in your life, and you know it's just like, handy, you know, like logging onto the computer. You know, there's times that I log on for no reason. I know that there's not going to be any apps to check. Because I've checked earlier on in the day. But just to do something and be like interacting. Do you know what I mean? (P1)

P1 highlights the presence of concerns and worries that he holds which can become a focus for rumination during his time in his prison cell. He uses the computer as a type of therapeutic intervention, to distract from the concerning thoughts. The computer becomes personified within the isolation of the cell with which P1 describes "interacting".

Participants also spoke of a benefit of the computers in relation to assisting with passing time, a particular advantage during long periods of time in one's cell when it was desirable for time to pass quickly. Several participants used the phrase "killing time" to describe how the computers assisted with managing long periods of time without other occupation:

> Now, so you've got a load of lads who are behind their door, who haven't got jobs and what. So, they'll just play the games. 'Cause it kills off the time and stuff like that. (P7)

P7 describes how active participation in games on the computer occupies time which required killing. This is not time that could be put to other use, or time which is being wasted, but P7's description is analogous to the targets in a video game which require taking out, to get through the level. Participation in the games on the computer enables prisoners to get through the level of the prison day. Medlicott (1999) interviewed prisoners about managing the concept of time during a prison sentence, an observation from participants in this study was the pain of contemplating long periods of time in prison and that time appeared to pass more slowly relative to outside prison. Their participants referred to the exacerbation of this experience through the limited options to occupy time. Participants in the current study in contrast referenced the in-cell computers as a counter to the power of time, through the provision of choice.

Knight (2012) explored the experience of living with a television in a prison cell. Participants in Knight's (2012) study noted that they used the television to alleviate boredom and to manage frustrations or negative thoughts. In the current study, participants had access to a television in addition to their in-cell computer. The in-cell computer offered a further occupation for the participants, and was seen as carrying benefits of choosing what to watch, increasing the alleviation of boredom and frustration as seen in this account following a comment from P3 about the computer's ability to take him away from repeating the same daily patterns:

> Interviewer: Can you say a bit more about that taking away?

> P3: Because like it's mentally, it affects your brain when you're constantly watching the same [emphasised] thing every day and doing the same thing day out and day in, it's not good for the mind.
>
> Interviewer: And how does the computer help with that?
>
> P3: Because you're seeing different stuff, and your brain's analysing into different stuff on different things, and you can think "oh that's interesting". Not like the TV where you can think "I'm bloody sick of watching this TV". It's like with the laptop, you've got the choice to watch different stuff.

P3 finds the monotony and repetition of the prison environment a mental strain, which is alleviated by the opportunity to exercise choice over what to engage with on the computer. He also highlights the difference in experience of the passive participation in media on television in contrast to the active participation of engaging with the computer.

For prisoners who share a cell with another prisoner, decisions about when and what to watch on the television need to be negotiated (Knight, 2012). In contrast, each prisoner is allocated an in-cell computer at the sites in the study. The computers were therefore referred to as opportunities to escape into a personal space. One participant described how the prisoner with whom he shared his cell would often snore when he was asleep which he found disturbed his own sleep. He used the in-cell computer and headphones to withdraw to a private space so that he was not listening to the snoring. Another participant, P5, described how the in-cell computers provided an alternative space to go to, away from challenging emotions evoked by the prison environment. When asked about the rationale for including quizzes on the computers, P5 responded:

> So, to keep them entertained. To keep people who are struggling on their own, or even if they're in a shared cell, you've got some form of escapism through the laptop to take your mind off it.

P5 references the computers as a virtual portal for the mind to escape the monotony or absence of stimulation or the presence of negative stimuli. The computer provides an opportunity for the mind to escape what the physical body cannot through the confinement of prison.

This sub-theme captures the power of the in-cell computers to counter the destructive influence of empty time. From passive, dependent subjects of the pattern of prison time, participants were gifted choice through access to the computers regarding how they used their time, with which they killed the enemy of monotony and repetition.

Sub-Theme 3.2: Easing Prison Stresses and Strains

This sub-theme refers to how the in-cell computers served to ease (though not remove) some of the negative emotions linked to the strains of prison life. The tools used to ease prison strain fell into different categories, content used to soothe negative emotions; the reassurance that the transparency of the computer enabled through a memory aid; providing a record of applications made and their progress; and the reduced stress of being able to top up phone credit at any time. The common thread throughout all these examples is participants' feeling that the computers supported their wellbeing and eased the stress resulting from prison strains. This sub-theme reveals participants' accounts of easing these emotional experiences, under the overall theme of "Coping With Cell Time".

Some participants described the direct effect of turning on the computer to medicate against anxiety or stress that they were experiencing. P12 for example self-reported their experience of using the computers for soothing purposes: "It chills you out, blocks the world out". P12 directly references the effect on his ability to self-soothe and recognises that this is one of the reasons that he uses the computers. P1 took this a step further, not only recognising the soothing effects of the computers but also planning for future episodes of troubling emotions by storing up content on the computer:

> The way that I tend to do it is I tend to save up things, for when I really need. So, there will be times perhaps when there will be something going on outside. So, I'll be like "oh, I really wanna watch that documentary". But then I'll save it, I dunno, for when I'm in dire straits. And then I'll watch it. (P1)

It is striking that P1 is aware of the powerfully soothing or distracting effect that his preferred content can have. He is prepared to deprive himself of the pleasure of instantly viewing the material to have it available as a metaphorical first aid kit for first time viewing at a time when he may be experiencing negative emotions. Sykes and Western (2021), in describing the experience of prisoners in a United States of American prison, through a series of interviews, file reviews and questionnaires, include a chapter on "the pains of imprisonment". Acknowledging that while prisons may not be as physically brutal for those living in them relative to previous generations, nonetheless time spent in prison involves non-physical pains which may be considered equal to physical harm. Sykes and Western (2021) include in this deprivation of liberty, deprivation of goods and services, deprivation of heterosexual relations, deprivation of autonomy and the deprivation of security, each of which is linked to the experience of negative emotions for prisoners. The assurance that the computers provided, through a transparent system of tracking messages submitted, was also referred to as a method of easing prison strain, for example P3 described the stress associated with not knowing if a person in the prison has received a request, and the contrast with the monitoring system on the in-cell computers:

> It's really stressful because you don't know what's going on. You haven't got no proof that you sent it. You've writ' this paperwork out, you don't get no copy … but when it's on a laptop, they have to give you a reply [thumping table for emphasis]. And that's the good thing about having a computer in your cell. They can't get out of the situation … they've got to reply, so it's a really good thing having a laptop. (P3)

P3 had been scarred through previous experiences with paper-based systems in which he was not assured by the process. His passion for the reassurance of the in-cell computer process reflected the relief and reduction in stress that this led to.

Finally, participants highlighted the impact that being able to top up their phone credit, at any time, through the in-cell computers had on their wellbeing. P8 described the jeopardy of arranging phone calls when a prisoner can only top up their phone credit once a week:

> It's an anxious time, especially if 99% of us will make arrangements with people to phone them at a certain time so that we know that they're in, obviously they can't phone us back or anything like that so, everything has to be planned basically. So, it's an anxious time when you ring someone and they don't answer, you know, or you haven't got the credit to phone them, it can be really quite stressful. (P8)

As discussed within Theme 2, "Staying Connected When the Door Closes", maintaining relationships with others is highly valued by people in prison. This sub-theme refers to the stress related to the practical elements involved in managing the arrangements to make phone calls. The in-cell computers remove the mental strain, through which prisoners attempt to anticipate and plan their communication needs for the upcoming week.

This sub-theme represents the ameliorative function of the in-cell computers referred to by participants. The functions and content available via the computers are recognised and used by prisoners to manage the negative emotions related to the strains of prison life.

Theme 4: A Better Place to Live

This theme draws on prison climate, the descriptor for how a prison is experienced as a place to live. In recent years, the importance of a positive prison climate has been recognised as key to creating a rehabilitative environment (Mann, 2019). Various initiatives have been introduced with the aim of assessing (Liebling et al., 2012) and developing (Joseph & Benefield, 2012; Royal College

of Psychiatrists, 2023; Skett et al., 2017) a positive culture in a prison. Research has supported the directions of these initiatives, finding that a positive prison climate links to more positive outcomes when prisoners are later released (Auty & Liebling, 2020). This theme represents the accounts of participants relating to how in-cell computers contributed to a positive prison climate. Liebling et al. (2012) describe three core elements to a positive social climate, including legitimacy, socialisation, and moral agency. That is for a climate to have a positive impact on current and future behaviour, prisoners should experience it as fair, have the opportunity for normal social interactions, and to have agency for self-development. Participants in the current study reported that use of the in-cell computer contributed to a more positive environment, summarised by the theme name “A Better Place to Live”. Within this theme were three sub-themes, “A Hand on the Steering Wheel”, “Trusting the Ground You're Standing on”, and “Lean on Me”.

Sub-Theme 4.1: A Hand on the Steering Wheel

This sub-theme reflects how the in-cell computers provided feelings of control for participants, through being able to direct their day to day lives. In the study reported in Chapter 3, the relationship between use of the computers and personal control was a strong contributor to the outcome variables of agency for desistance and wellbeing. The current study uncovers the experience for prisoners for how the computers relate to personal control. The nature of the control described by interviewees included being able to choose when or what content to watch or listen to (rather than rely on what was on the TV or radio); choosing when and who to communicate with inside prison; having the information to manage their budget and being able to review their meal choices. The relationship between this ability to exercise choice and control and participants’ feelings of wellbeing was a key element of the sub-theme and has overlaps with the sub-theme in the previous section, easing stresses and prison strains. This is illustrated by P5, when asked about the ability to complete transactions from within his prison cell:

> Self-esteem wise it's quite important I think because you can be independent, obviously, prison kind of strips you down and kind of takes you backward in terms of being reliant on other people. I think if you can rely on yourself, it is quite good for your headspace. (P5)

P5 exposes the process of reverse adulthood that prison can bring about, reducing independence through the necessary reliance on the institution. He refers not only to a physical dependence but a psychological dependence and the resulting impact on mental health. Dependence on the institution to make decisions and diminished self-worth are two harmful elements of prisonisation (Haney, 2002). Haney (2002) describes the potential for people serving long prison sentences to become immersed in the rules and procedures of the surrounding institution and consequently to experience degradation of their own internal processes of control. P5 continues to explain how the in-cell computers provide him with agency to regain some of the control that prison had stripped away:

> I would say that in terms of living autonomously as you can, it's a massive plus, that means that you can, your self-esteem gets a bit of a boost, because you're not so reliant on people, like me for instance, I lived a very independent life outside and so for me to come in and rescind a lot of that, it's hard, and it doesn't do your confidence a great deal of good. It's really regressive. By being able to operate control over various parts of your life, OK it doesn't make up for lots of other ways you'd normally live, but it's a massive plus … basically, it's a lift in your quality of life here. (P5)

P5 feels the in-cell computer restores some of the independence and control that he had before coming to prison; he is able to regain some of his pre-prison identity of being an independent person.

There was a contrast between the seemingly minor parts of participant's lives that the computers provided control over, such as choosing when to move money from their financial account to their telephone account, and the strength of feelings of relief and empowerment that

this provided. In a discussion about how being able to order shopping or top up phone credit at a time of his choosing affected his life in prison, P8 explained:

> It's a huge difference. When you're sat behind your door it's something that you can control a little bit, rather than waiting for someone else to you know, to control it for you if you like it's, putting phone credit on, you can put it on any time of night, where sometimes you might run out during the night, and that's it there's nothing you can do until the next day, whereas while you've got your laptop in your pad you can just go and put some more credit on so, you know, family ties, it's better for stuff like that. (P8)

Access to their account balance and the ability to decide the amount of money to move to their telephone account was commented on in relation to how participants felt about their relationships with their families:

> Say you have an argument with your partner on the phone yeah, and you runs out of credit on like a Friday, and the credit doesn't go on for 5/6 days, it's a long time to stew, and it does make you ill like. Or even if it's just things you want to talk about, it's like, it could be anything, it could be your mother or father, your children, it could be your son's birthday on the Friday, and you've run out of credit on the Thursday. (P11)

P11 is not describing a specific example in the quote above, but rather a feared future, of what could be the case in the event of not having access to top up credit. The computers provided an assurance that they had the capability to manage unanticipated events which may occur in their families. Through this P11 can be the person that he would like to be, given his situation, within his family unit. There are links between this theme and the sub-theme 2.1, "Living Outside From the Inside". In contrast to 2.1, this sub-theme reflects the control that participants expressed in relation to managing the credit on their telephone account and the assurance that this provided. This was further emphasised by P4, when asked about the feeling of only being able to top up phone credit once each week (in prisons without in-cell computers):

> It's horrible. Because you never know what's going on outside, you know. You could ring up and then you could be stuck on the phone for hours. Somethings going on or you could be on the phone for two seconds. But in here you know you could always put credit on. Talk for a little bit longer, you know. (P4)

As with the previous example, P4 is not describing a personal incident that has happened to him, but rather his fear that this could happen to him in the future. The computers provide reassurance that he would be able to manage the imagined situation in the future, reducing the worry about what might be.

Access to financial accounts was frequently mentioned by participants, however other functions of the in-cell computer collectively contributed to the attribution of control that using the computers provided. Having the ability to review the meals that they had selected, contacting other departments, and deciding how to structure their evening viewing of programmes were also identified. Use of the computers had become a routine part of their day. In discussion with P10 about being able to access the computer whenever he was in his cell, he explained:

> It feels better. You don't have to wait for the officers to let you out of your cell. You can just go straight onto your laptop. As soon as I get into my cell now, I'll go into my laptop to double check what I'm having for dinner. See how much credit I've got on my phone. See if I need to put more money on. So, I don't have to wait for the officers. (P10)

He is not dependent on others for these small daily tasks and as a result has gained control over some aspects of his life. Use of the computer is a habit which is built into his daily pattern, enabling him to exercise control over some aspects of his life. P8 summarised the essence of this sub-theme, "It's a bit of self-fulfillment really isn't it, everything in prison is controlled for you but if you've got those, it's only the little things that just make a big difference".

An increase in agency and autonomy has been identified as a potential impact of providing prisoners with computer access (Champion & Edgar, 2013; McDougall et al., 2017). This sub-theme

reflects prisoners' comments that the in-cell computers provide feelings of agency over some aspects of their lives. Providing an environment which increases prisoners' perception of their agency and internal locus of control, and which reduces the impacts of institutionalisation contributes to a positive social climate and the subsequent anticipated benefits on release from prison.

Sub-theme 4.2: Trusting the Ground You're Standing on

This sub-theme relates to levels of confidence that prisoners had in the prison to respond to requests and complaints and to provide a reliable place to live. The interviews evidenced a relationship between these levels of confidence and the in-cell computers. Confidence in prisons to deliver a just environment is often referred to as the degree of legitimacy that prisoners perceive the prison to have. Increased levels of perceived legitimacy in prisons have been linked to improved prisoner wellbeing and compliance with rules (Auty & Liebling, 2020). Two key elements of the functionality of the computers contributed to the relationship with increased legitimacy, firstly the ability to view the progress of a request or message sent to prison departments and secondly, being able to watch recordings of prison managers making announcements or council meetings.

In prisons without in-cell computers, communications are sent to prisoners via notices to prisoners, a typed note, with details of the information, signed by the sending manager. While those drafting the notes may take efforts to write notices in a procedurally just tone, the tone interpreted by the recipient may be different to that intended. There is a reliance on prisoner literacy and little information is communicated about the sender aside from their name. In comparison, in prisons with in-cell computers, communications are frequently made through managers recording messages on video. This format made a difference to how the information was received by prisoners, for example, managers were perceived to be less aloof and the communication detail easier to understand:

> What tends to happen in prison is you think that governors all sit in an Ivory Tower somewhere, making up these different rules that are or are not obeyed. Um, if you actually see them about on the communities, or you see them on the digital hub you, you feel that they, you get a better sense that they're trying to help, you know you get a sense that they've actually thought about something and they're trying to work out the answer to a problem rather than just sitting somewhere where nobody's ever going to see them. (P8)

In this account P8 equates receiving a video message from the Governor to seeing them on the wing, in both instances he can understand the motives behind the communication and accept the changes introduced more readily. While the Governor's ability to be present on all wings is limited by their availability, in contrast videos can be easily shared across all wings. There is therefore potential to increase levels of perceived legitimacy and institutional trust to a wider group. Unlike other primates, eye contact for humans is non-threatening and assists social communication (Harrod et al., 2020). The qualitative difference of seeing the person delivering the message, with the accompanying non-verbal communication fostered a connection between the message deliverer and the message recipient:

> It's like face-to-face contact you know. When they write it to you on the email, for me, I scan it and think "what does that mean?" … when they tell you on a video, they give you more, they give you more information you know. (P4)

The "more information" that P4 refers to illustrates the experiential difference between receiving a piece of paper with text and a video which includes tone of voice and non-verbal communication. The message sender has changed from a faceless unknown to a human with whom the prisoner can relate. This adjustment contributes to the increased legitimacy perceived by the prisoners. This importance of human relating is seen in P2's observation when discussing the video messages by governors:

> it's nice to be able to see the face of the Governor, and hear them talking, because most people never get to see the Governor, so they feel they are familiar with the person, the message comes over and they hear it from, almost like firsthand. (P2)

P2 experiences the Governor's messages as if they are speaking to them personally, that they are familiar with the person on the screen despite not having met them, this alters the way that he receives and interprets the message.

In addition to the video messages to prisoners, the council meetings, at which prisoner representatives discuss issues relating to the prison with prison managers, were recorded and shared on the in-cell computers at one of the prisons. The ability to directly observe and interpret the proceedings of the meetings was felt to influence the quality of the information received and therefore the confidence in the institutional operations:

> I think staff can be held accountable for announcements they make if they do it on video. Not just the resident council but all of the other internal stuff we make, you know, you're hearing it direct from that member of staff, that department, and one of the attached benefits of that is that the message can't be distorted again, which happens all the time in prison where something that's said, as it's handed, as it's passed on, will morph, and it kind of eliminates that because person A and person B can both watch the same video and not miss-share. (P5)

In contrast to the humanising of governors via the video messages, the committee meeting videos were valued for the accuracy of the information they provided. In the comment above, P5 describes the value of hearing directly from the decision makers what has been said, without the message being distorted by passing between people. This confidence that the message heard is accurate contributes to the perception of legitimacy. P2 had previously been a member of the prison council and noted the experience of attending the recorded council meetings and the conversations that

followed as he walked about the prison. People who he did not know would stop him, having seen him on the in-cell computers, to ask about issues, he reflected:

> so, it becomes a closer-knit community, you'll also see other prisoners talking and you see people on other wings, and you hear all the issues, it creates like a little microcosm, you know like of within the prison community. (P2)

The process of recording and sharing the committee meetings had the effect of increasing the accountability and the contact between the committee members and wider prison community. Increasing the stake that prisoners perceived they had in the operation of the prison, built the feeling of collective responsibility for the prison environment.

The second key aspect contributing to legitimacy was the ability to track the progress of messages. While in sub-theme 3.2 "Easing Prison Stresses and Strains" this function was referenced in relation to participants' emotional management, the same function contributed to participants' feelings of trust in the institution. At prisons without in-cell computers, prisoners communicate with prison departments, for example, their probation officer, finance team, property department, through sending handwritten messages. These are generally placed in an internal post box or handed to staff, after which they move through the prison via the internal delivery system. Once the message has left the prisoner, there is no way to track the progress of the message. In contrast, the in-cell computers enable prisoners to send messages via the computer. Once the message has been sent, prisoners can view whether the message has been viewed and they receive a response via the same route. Participants described the increase in confidence in the prison that this facility provided:

> So basically, I had some general issues around prison because of personal bad experience that I had in prison. And I don't know. Part of it was me. Part of it was issues with staff. And just sometimes I felt. You know, like having things recorded. Where everything is, like they say, general applications and stuff like that. Having everything. Like the times the dates.

> Everything recorded. Where people can verify and check what I am saying, for me was very important. That was one of the major [emphasised] things for me. (P1)

For P1, the ability to see the progress of messages that he had sent transformed his experience of the prison, increasing his trust in the processes and his perceived legitimacy of the prison. His previous negative experience lacked a recording process, limiting the steps he could take if an error occurred. With the in-cell computers, he had confidence that should a discrepancy occur, he could access evidence. P3 also highlighted the impact that this transparency and accountability had on their trust in the systems:

> I've got proof. That's the good thing about the computer system. When it was a paper trail. Paperwork used to get lost so much. You know if they didn't want to bother with it, they'd say "oh we'll destruct that, we'll forget about that, he ain't got no proof. It's a paper trail, he can't prove it." But now it's on digital laptop. No one can get away from what they put on and send off to the person. It's logged. (P3)

Participants did not present specific examples of when they had needed to use the message trail for evidence, rather the fact that it would be possible to do so provided the legitimacy. This is the essence of a positive climate and legitimacy, that those living and working in the environment perceive fairness is instilled in the processes rather than necessarily having direct personal experience of an issue to resolve.

Internet access in the community outside prison has changed the relationship between governments and their electorates. Leaders can now communicate more directly and personally with communities through social media, video, and the internet, without relying on newspaper or television media. This sub-theme reflects a similar shift within prisons, where Governors were able to communicate more directly with prisoners, and to humanise their communication. Participants in the current study noted the advantages of this direct communication method which contributed to their engagement with the prison community. Overall, the videos and the record keeping of the

computers increased trust and feelings of legitimacy in the prison, which contributed positively to prison climate.

Sub-Theme 4.3: Lean on Me

This sub-theme relates to how use of the computers lifted some of the obstacles in daily life that participants faced in prison, and links to the survey findings from the study reported in Chapter 3. In the previous study, prisoners reported finding the in-cell computers were easier and more convenient than the alternatives and noted the value of the spellchecker and calculator. The current study illuminated the psychological experience of these practical aids. Although difficult to ascertain with confidence, up to 82% of prisoners are estimated to have experienced a traumatic brain injury (Allely, 2016) and around one third of prisoners to have a neurodiverse learning need (Foundation for people with learning disabilities, 2023). A significant proportion of prisoners are therefore likely to experience challenges navigating the environment of a prison, without their established network of support available outside prison and when adapting to a new environment. As discussed above, coping, and managing in prisons without in-cell computers relies on confidence with reading and writing.

While in-cell computers did not solve all challenges of managing in prison, they assisted in a variety of ways. Even for prisoners who did not mention learning needs or neurodiversity, the in-cell computer functionality "just made things easier" (P2). For participants who found reading a challenge, inclusion of pictures on menus, and the ability to listen to video messages from managers, was helpful:

> I can put my canteen and I can sit there and go through it. I haven't got a rush to go through things, and I can't read or write properly. And on the computer system, it's got pictures of everything. (P3)

The in-cell computers provided P3 with the time to process the tasks needed to order his weekly shopping, providing real choice relative to the standard paper-based tick-box sheet.

Participants also described how the in-cell computers assisted with writing, in discussion with P10, a prisoner with dyslexia, about whether he preferred to write on paper or use a keyboard, he stated his preference was:

> To type, because if you make a mistake, you can delete it and do it again. If you write it and you scribble it, it looks scruffy then. If you type it on the computer, you can have one of your mates look at it and then you can, right send it… Yeah, it's easier and it's neater, I write like a 2-year-old. (P10)

The computers were a leveler, by enabling communication through typing rather than writing, P10 was assured that his messages would be less likely to be judged by the recipient relative to a message written with poor writing with amendments. In addition to concerns about discrimination, participants also referred to feelings of shame related to their poor writing ability. Being able to communicate through a keyboard relative to writing negated the presence of shame felt in relation to poor writing skills.

The computers also served as a memory aid, reducing the cognitive load for participants by taking care of storing information that otherwise might need to be remembered:

> So, I forget things really easy coz I've drunk a lot over my life. Like I'll go back in a bit, I've already looked what I'm having for my dinner, it's a ham bap, but for some reason I'll go back and just double check again. (P10)

The knowledge that the computer was storing information, which others might retain more easily to memory, provided reassurance for P10, who suffered from memory impairment due to alcoholism. Outside prison, prisoners with memory difficulties may be able to rely on friends of family or familiar routines for support. In contrast, prison presents an unfamiliar environment, with the expectation of

retaining new information to cope with prison life. The in-cell computers provide a support for those with a need in this area. Overall, the in-cell computers supported participants in prison, this was the case across participants, but the benefits are particularly pertinent for those facing challenges through brain impairment or neurodiversity.

Theme 5: Rage Against the Machine

In sub-theme 4.2, "Trusting the Ground You're Standing On", the benefit of being able to rely on the computers, relative to the fallibility of human behaviour was evidenced. The flip side of this confidence in the computers was a higher level of expectation that the computers would work consistently. This final theme, "Rage Against the Machine", named after a band of the same name, possibly named due to the band's frustration with the mechanical problems of the band bus, (Radio X, 2023), reflects the frustration that participants expressed when the in-cell computers were not working. Two sub-themes contribute to this overall theme: "It's a Computer, It Should Be Instant", and "It's Gone Down!"

Sub-Theme 5.1: It's a Computer, It Should Be Instant

As described above, the in-cell computers provide a timeline of the progress of messages sent to other departments, allowing prisoners to track when a message has been sent, and when it has reached a department. While this ability to see the message progress was noted as a positive, participants expected that messages would be answered quickly once they had arrived at the destination:

> If you do a paper app [application to a department] you understand it's got to be sent to somebody, you understand that takes a bit of time, someone's got to send it to somebody, that takes a bit of time, someone's got to sort it out, someone's got to send it back to you. Takes a bit of time. If you do an app on your laptop, you expect a response the next day

> because it's all digital, the apps been sent straight to them so why haven't they answered. (P8)

The increased expectation as to the speed of the response led to frustration, the ease of checking for messages drew participants to regularly check the system, with frustration increasing when messages remained unanswered as P8 describes:

> And it's taking longer, a lot longer than it would with a paper app, so sometimes you can wait 3 weeks for an answer, staring at your laptop, which is just frustration and anxiety. (P8)

In these situations, the accessibility of the in-cell computers changes from a benefit to a disadvantage, as prisoners feel compelled to repeatedly check if a reply to their request has been received. P7 describes the challenge that this creates for prisoners and for the prison to manage:

> Yeah, that's why [referencing the extended period to respond to an application] most laptops get smashed up or thrown out, something like that, because nothing comes back or the lads you know what I mean, mental health, if nothing comes back within that, you know what I mean, their heads are going and stuff like that. (P7)

The physical proximity of the computer within the cell allows prisoners to log on whenever they wish, relative to checking for paper mail which would only take place at a certain time each day. When replies are received, this can serve as a powerful intermittent reinforcer to maintain the checking behaviour, leading to a cycle of frustration and anxiety. As P7's comment above highlights, this cycle can lead to prisoners expressing their frustrations with destructive behaviour.

Sub-Theme 5.2: It's Gone Down!

The concept of 'technostress', defined as negative emotion that results directly from the use of ICT or technology (Shu et al., 2011), has been observed to be a human experience associated with the growing access to and dependence on technology. The stress or negative emotion is absent prior to the arrival or introduction of the technology and is linked to increasing technology dependence.

This final sub-theme relates to technostress experienced by participants when their in-cell computer stopped working, either because of a full prison computer issue or due to an error with their personal device, as illustrated by P1's comment about being dependent on the computer: "Because you don't realise how much you rely on it. And then when it's not there, yeah I found it so annoying and frustrating". Once use of the computer had been normalised and had become an expected part of their prison cell environment, to revert to life without one becomes problematic for prisoners. Further, because many of the processes in the prisons had moved to be completed digitally, the lack of access was felt more keenly than at prisons without in-cell computers, dependence was not just psychological, it was practically challenging to live without a computer:

> I haven't had a phone call since I've been here. 'Cause they haven't sent my PIN, I went to use the phone, they keep saying there's a problem, I haven't got my PIN phone. It's supposed to come on the laptop. (P11)

P11's laptop was not working at the time of interview, his situation illustrates the challenges of living in a prison with in-cell computers when you are unable to access the computers. The control which has been referenced within previous sub-themes is now lost, prisoners without computer access become disadvantaged and potentially lose access to important entitlements.

While breakdowns are an inevitable part of a computer system, participants were critical of the process for when their devices stopped working:

> My laptop broke down on me last time it stopped working. All the keyboard stopped on it. Like stopped working. And they said, "oh yeah, you'll have one in a couple of days". And they never did. It took me, like two months to get a laptop. (P3)

The contrast with the improved perceived legitimacy in sub-theme 4.2 is stark, when prisoners cannot access a computer, their confidence in the operations of the prison drop as they are unable to partake in day-to-day life. Participants in the study who reflected on periods that they were

without access to a computer (in a digital prison) reflected on the helplessness of the situation, with the only option available to wait until a new device was provided. This sub-theme captures the vulnerability of living in a digital prison without access to an in-cell computer and highlights the dependence felt towards them. Prisoners in such circumstances struggle to manage their day-to-day life and the previously mentioned advantages of the in-cell computers, such as increased agency and control are reversed.

Conclusions

The aim of this study was to explore the experiences for prisoners of living with an in-cell computer, and to explore the positive and negatives of living with an in-cell computer. As the second study in the sequential mixed methods design, the study built on the quantitative study presented in Chapter 3. The previous study aimed to explore the psychological outcomes associated with in-cell computer use and identified relationships between frequency of use of in-cell computers and agency for desistance and wellbeing. The current study sought to understand these relationships through the reported experience of prisoners collected in interviews. Interview design for the current study was informed by the findings from the previous study. Reflexive thematic analysis was used to analyse data from one-to-one interviews with prisoners living with in-cell computers, to describe five themes: “Making Good Use of My Time”; “Staying Connected When the Door Closes”; “Coping With Cell-Time”; “A Better Place to Live”; and “Rage Against the Machine” which collectively illustrated that in-cell computers mattered to prisoners.

Previous literature has hypothesised benefits of introducing personal computers to prisons, based on the impact of computer use outside of prison and the introduction of other technologies to the prison environment (Champion & Edgar, 2013; McDougall et al., 2017; Palmer et al., 2020). Given the investment in the technology to date, policy makers also anticipate benefits to computer provision. This study sought to explore the experience of living in a prison cell with a computer against this background of anticipated benefits.

The first theme: “Making Good Use of My Time”, highlighted how prisoners felt they had opportunities for growth through the in-cell computers, in relation to developing digital competence and to their wider rehabilitative progress. Psychologically, the prison sentence had a more rehabilitative function increasing the acceptability and purpose of time spent in prison. The second theme: “Staying Connected When the Door Closes”, captured the connectivity that the computers enabled, interviewees expressed that the computers normalised their relationships with family and friends and facilitated more effective communication with professionals in prison. Participants were better able to maintain their identity within their external network of friends and family and had agency over their communications with others. The third theme: “Coping with Cell Time”, focused on interviewees’ discussions of how the computers eased the psychological challenges of managing long periods in their cell, supporting with managing boredom and easing negative emotions. The computer was used as a method of ameliorating current and future feelings of stress or anxiety. The fourth theme: “A Better Place to Live”, represented interviewees feelings that the computers gave them some control of their lives, increased their confidence and belief in the legitimacy of the prison, and provided practical support. Together these elements showed interviewees’ trust in the prison and personal agency were supported through computer access. Finally, interviewees’ frustrations and anxiety were represented by the fifth theme, “Rage Against the Machine”. Expectations of the prison, for example, speed of response times to requests, were raised by the computers and therefore had further to fall. When computer access failed, prisoners struggled to manage their lives in a digital prison. Collectively, interviewees reported frustration and anxiety about failures with the systems.

The opening section of this chapter summarised three areas of psychological interest that may be experienced differently living in a prison cell with a computer relative to a prison cell without computer access, gaining control and autonomy, procedural justice, and relationships. Interviewees in the current study felt that the computers gave them tools to conduct their lives in prison. The location of the computer was important within this, being available within their cell, the tools could

be accessed at a time of their choosing and at their preferred pace. Interviewees found that this provided them with feelings of agency and guarded against negative emotions. The ability to control and manage parts of their lives also increased trust in the prison processes and consequently the perceived legitimacy of the prison. Interviewees spoke of the connectivity that the computers provided them with. They valued the ability to email family and friends and observed that this method of communication allowed them to hold their roles and identities within their family and friendship groups in a normalised way, with fast messages enabling synchronisation between life inside and outside prison. Relationships with prison officers were also spoken of as improved by the computers, interviewees described being less reliant on prison officers to complete tasks on their behalf, which allowed conversations with officers to become discussions rather than requests or demands.

The findings of the current study provide insight into the results of the quantitative study in Chapter 3, which found a relationship between frequency of use of the in-cell computers and agency for desistance. Interviewees in the current study explained how the computers provided them with the opportunity for growth towards a desistance pathway on release, they felt that they were making productive use of their time and had control over accessing resources related to employment and education. It is of note that the strongest contributors to the mediation effect in the relationship between frequency of computer use and agency for desistance in the previous study, were personal control and growth, which echoes with the views of interviewees in the current study. The previous study also found a relationship between frequency of computer use and wellbeing. In the current study interviewees referred to the soothing role of the computers, through easing boredom and reducing anxiety and frustration. Having confidence that they could act in the event of challenge, e.g., if more phone credit was needed or to recall details of an appointment reduced worry about the future. The interviewees comments again mirror the quantitative study in that the strongest contributor to the mediation relationship between frequency of computer use and wellbeing was that of personal control. From the survey responses in the first study only a small

number of prisoners commented on the value of the computers in relation to digital confidence. The current study provided an opportunity to explore this in greater depth. While the opportunity to increase digital literacy was valued by some participants, there was broader acknowledgement of the ability to keep pace with technology in the community that the in-cell computers provided. The current study also provided greater insight into the relationship between the computers and procedural justice and the experienced prison climate. The previous study had found evidence for climate measures (perceived support from prison and growth) contributing to the mediation between use of in-cell computers and the outcome measures of wellbeing and agency for desistance. The current study revealed specific functions of the computers (video messages from governors, application tracking, and viewing community meetings) which contributed to prisoners' feelings of engagement with and trust towards the institution.

Final Commentary

This pioneering study informs the evidence base for technology within custodial settings and specifically the evidence for personal computers within prison cells. The theoretical findings support practice and policy implications for the wider installation of personal computers in prisons to provide a more rehabilitative environment and to support the wellbeing of prisoners. While the technology explored in the current study was the personal computer, the application of the findings can be considered relevant to technology use within custodial settings more widely, the background to which is discussed in Chapter 2. The proposed theory suggests that where the functionality of the technology links to increased coping, self-governance, and connection, positive outcomes might be anticipated in relation to rehabilitation. When considering investment in technology for settings it is recommended that attention is paid to these three areas.

As with previous chapters, to avoid repetition across chapters, limitations and strengths of this study, as well as implications for policy, and future recommended research will be considered in the thesis discussion, in Chapter 5. Of specific relevance for the current chapter is the researcher's

positionality and the relevance of this to the interpretation of the findings, this is discussed in Chapter 5.

Chapter 5 – General Discussion

The studies in this thesis set out to address the research gap relating to understanding the experience for prisoners of living with a personal computer in their cell. Previous research has highlighted benefits that technology, such as televisions, kiosks, tablets, and in-cell telephones can bring to prisons (Barkworth et al., 2022; Knight, 2012; McDougall et al., 2017; Palmer et al., 2020). In recent years, a new technology, personal computers, has been introduced to some prison cells in England and Wales. To date, little research has been carried out to understand the experience for prisoners of this adjustment to their environment. Understanding this phenomenon is critical to the development and application of digital infrastructure policy in prisons, to support a movement towards increasingly rehabilitative environments. The thesis sought to close this research gap, to contribute to the literature base and to provide guidance for those responsible for funding and designing custodial environments. This chapter discusses the thesis findings in relation to the three primary aims for the thesis, as described in Chapter 1, which were:

1. To explore the prisoner experience of living with a computer in their prison cell.
2. To explore the processes through which the use of technology in prison relates to rehabilitation.
3. To inform policy concerning technology in prisons which has a rehabilitative purpose.

When discussing the findings from the studies covered in the thesis, links will be made to the existing literature in the field. Implications from the thesis for policy, practice, theory, and future research, will also be discussed.

Research Aim One – Prisoner Experience of Living With a Computer

The first research aim was to explore the prisoner experience of living with an in-cell computer. The addition of a personal computer to the prison cell, represents a significant adjustment to the prison cell environment. While positive outcomes have been associated with the introduction of technology into prisons, other research has also highlighted challenges when

computers are placed in cells, such as an increase in isolation (Robberechts & Beyens, 2020) and an increase in responsibilities and expectations placed on people in prison (Robberechts, 2022). This thesis aimed to understand the experience for people in prisons in England and Wales who were living with personal computers.

One area of interest relating to the introduction of personal computers to prisons concerns the adjustment in the relationship between prisoner and prison officer. This relationship is known to be vital in relation to positive prison dynamics and outcomes on release from prison (Crewe, 2011; Liebling et al., 1999). With the reduced need for prisoners to request assistance from prison officers to complete tasks, Studies 2 and 3 explored this relationship. Prisoners responding to the survey perceived that the ability for them to complete more tasks in their cells, led to a reduction in time spent out of their cells, reducing their opportunity for interaction with others. Time out of cell was not investigated in the study, and there is no evidence to suggest that the computers were the reason for extended periods locked up, but this was a prisoner perception. The interviews provided an opportunity to explore the impact of the computers on staff prisoner relationships more closely. In contrast to feeling that the computers impaired staff prisoner relationships, the prisoners interviewed described improved quality of contact with prison officers. During interview, prisoners described that prior to having a computer they felt a need to “pester” officers to get tasks completed. This arrangement suited neither the prisoner nor the prison officer. Once the pressure of requiring tasks to be completed by the prison officer was lifted, prisoners observed that their conversations focused on discussions about topics of mutual interest. From the prisoner perspective, the relationship became less fraught, and interactions were more pleasant. This finding is consistent with Champion and Edgar’s (2013) observation that technology in prisons has the potential to reduce dependency of prisoners on prison officers and the resultant advantages of agency that this concurs. The mixed findings above, that the computers were perceived as a cause of both reduced contact with officers through increased time in cell, and that quality of contact between prisoner and officer was improved, provides insight into the complexity of the prisoner and prison officer

relationship. The structure of prisons leads to high dependence and expectations between the two groups, each needing the other to achieve a satisfactory day within prison. The findings indicate that elements of the interaction that the computers replace are not missed by either party, and for some individuals the space left is replaced by more positive interactions.

While prisoners reported lower dependency on prison officers following the introduction of personal computers, the dependency to some extent transferred to the computer itself. In Study 3, the sub-theme “Lean on Me” captures the way that the functions on the computer were experienced by prisoners as removing obstacles. Some of these advantages were particularly relevant to prisoners with neurodiverse needs, for whom the computer replaced the need to use handwriting with typing, supported memory challenges through displaying the timetable and menu, and enabled confidence with mathematical tasks through the calculator. Across the interviews, prisoners described the computer having taken a place in the pattern of their daily lives. Mirroring the variety in how people in the community use computers, some prisoners described using the computer for long stretches of the day, while others logged on to complete specific tasks. For each individual the computer was integrated into their prison lives. The swell of appreciation for the computers was noted by the majority of respondents to the survey who stated that there was “nothing” that they disliked about the computers. From the interviews, it was a universal opinion that computers should be provided across all prisons for all prisoners. This valuing of, and dependence on computers had a downside. When access was not available, for example due to not having yet been allocated a computer, a computer breaking down, or the system failing, the pain was felt keenly. Not only was the pattern of daily life disrupted, but functioning effectively in a prison where the systems rely on use of a computer was more challenging as the previous non-digital processes had been removed.

Confidence in prison processes, and the associated belief in procedural justice experienced at a prison has been shown to influence outcomes on release (Beijersbergen et al., 2016). The

research explored the trust that prisoners experienced towards the computers and their functionality. Interestingly, of the eight emotional categories available when sentiment analysis was applied to the survey responses, that of trust was the strongest category in which words were grouped. This observation was reinforced through the prisoner interviews and captured in the sub-theme “Trusting the Ground You’re Standing On”. Key to this finding was the looking glass that the computer provided to the wider environment around the prisoner. Analogous to the experience of feeling familiarity with celebrities that appear on the screen in one’s living room, the computer screens brought videos of the Governor or recordings of community meetings to the prisoners’ cells. As a result, prisoners felt that at some level that they knew the person taking the decisions and could relate to them as a fellow human. While the reassurance of experiencing a human making decisions provided confidence in the prison, in contrast it was the assurance provided by the non-human machine which inspired confidence in relation to requests. Prisoners experienced the electronic record that the computers displayed following submission of an application as reassuring and contrasted this with their perception of the unreliability of processes which relied on humans to deliver them. Overall, the research suggests that prisoners had trust and confidence in the computers, and this influenced their perception of confidence in the prison more broadly.

Research Aim Two – To Understand Processes for how Technology Relates to Rehabilitation

The second research aim sought to understand the processes by which technology in prisons may link to areas that support a rehabilitative environment. Previous research has found that introducing technology, such as telephones, televisions, and computers to prisons, is related to positive behavioural and psychological outcomes (Barkworth et al., 2022; Knight, 2012; McDougall et al., 2017; Palmer et al., 2020; Robberechts, 2022; Thaler et al. 2022). To date, the mechanisms through which these positive effects take place have not been established. This is a critical research gap, without understanding the operating pathways, the technology cannot be shaped to best achieve the rehabilitative effects. For example, if particular functions or types of content on the

machines more heavily contribute to pathways which explain overall effect, these should be prioritized to maximise the rehabilitative impact of the personal computers. Before the question of pathways and mediators could be established however, it was necessary to determine the nature and correlates of personal computer use. Study 2 is the first large scale study in the United Kingdom to examine correlates between individual prisoner use of personal computers and psychological variables that have been proposed as potential benefits. Prisoners who self-reported using the computers more frequently also reported higher levels of wellbeing and more positive indicators of agency for desistance. These two outcome variables were selected as indicators of reduced likelihood of reoffending on release. Improvements to mental wellbeing in prison has been shown to be related to reduced likelihood of reoffending (Wallace & Wang, 2020), while agency for desistance has been shown to be related to reduced expectation of the positive outcomes of crime (Lloyd & Serin, 2012). The relationship between computer use and agency for desistance and wellbeing was explored using a series of theoretically linked mediators based on the proposed pathways described in Figure 3.1 (p70). Computer use was found to predict growth, autonomy, personal control, perceived general support, perceived support from prison and trust. These variables in turn predicted agency for desistance and wellbeing, illustrating partial mediation of the relationship between computer use and agency for desistance and wellbeing. The results from Study 2 supported the proposed model of change (Figure 3.1, p70), with mediators from six measured variables feeding into the three pathways. The study provides the first evidence of why computer use predicts beneficial outcomes linked to rehabilitation. Within the discussion for Study 2, suggestions were proposed for the specific functions on the computers which may contribute to these pathways. For example, the entertainment, information, and games functions may support the pathway of coping and resilience; the transaction functions (e.g., checking account balance, ordering shopping, messaging prison departments) may support the control and autonomy pathway; and the email and internal messaging functions may support the maintaining relationships pathway.

While Study 2 provided quantitative evidence of the processes through which personal computer use related to rehabilitative outcomes, Study 3 extended these findings by introducing rich, qualitative data to better understand the experiences, nuances, and processes involved in the identified pathways, as well as identifying novel findings. In a theme, that resonates with the first pathway from Study 2, coping and resilience, participants noted how the computers helped in "Coping With Cell Time". They described how the computers provided them with activity during extended periods in their cell, and that use of the computer was an antidote to stress and negative emotions. Maintaining hope, and its counterpart fatalism, have been identified as contributors to desistance in a positive and negative direction respectively (Martin & Stermac, 2010). Participants in the current study reported that the computers provided them with tools to manage challenges, this was spoken of in a planned and conscious manner. Where the computer content had been an antidote to managing mental health challenges, individuals returned to the activity or even saved it up to use when times were hard. By virtue of the presence of the computer in the cell, prisoners were able to live out a version of themselves with improved coping strategies, which contributed to improved wellbeing and is supportive of desistance (Wallace & Wang, 2020).

In relation to the second pathway, which focused on self-governance skills, participants in the study spoke of how access to the computers made the prison "A Better Place to Live", through handing them control over aspects of their lives, increasing their confidence in the prison systems, and by providing practical support. On one level, participants were describing the physical transfer of administrative tasks, such as checking balances or submitting applications, from prison staff to prisoners. That is, in a literal sense the computers gave them control and autonomy over aspects of their lives. In addition to the literal control that the computers provided for prisoners, participants expressed a deeper impact on their internal feelings of agency. The perspective of the prisoner in the sub-theme "A Hand on the Steering Wheel" is deliberate, through the computer access they experience their journey and outcome through their sentence from a front seat position, with

influence over its direction. This potential to self-determine is supportive of wellbeing and desistence.

Finally, Study 3 informed the remaining pathway, which focused on connection, both within prison and to those outside prison. In a manner analogous to the impact that electric lighting had on humans' ability to extend their active hours, prisoners reported that the point of lock-up no longer indicated the shutdown of communications. What had previously been dark hours for communicating transformed into periods of connecting with others. They were, in the name of the theme "Staying Connected When the Door Closes". Inside prison, through the internal messaging process, prisoners could communicate with people in departments they needed assistance from. Their messages, in contrast to that of prisons without personal computers, went with what they perceived as precision accuracy to the right department, in the name of the sub-theme, they had "A Direct Line". Through these systems prisoners could solve their problems, gather information, and build supportive relationships to assist them on release. The reach of communication however was further than the prison walls. Through the email-a-prisoner system, prisoners became engaged in the day-to-day lives of their friends and families despite distance or temporal mismatches. As social animals, the deprivation of social contact is a significant pain of imprisonment, which is also known to inhibit success on release from prison (De Claire et al., 2019). The ability to maintain relationships with friends and family, through connecting via email, is likely to benefit prisoner wellbeing, and to support desistance from crime on release. The positive influence of family connection on likelihood of future reoffending has been established through more traditional face-to-face visits, with those prisoners receiving visits having a 39% lower rate of reoffending relative to prisoners who did not receive visits (May et al., 2008). Markson et al. (2015) provided further evidence of the importance of family support through a longitudinal study, involving interviews with prisoners and their partners before and after release from prison. Positive family relationships were associated with positive markers of resettlement such as finding accommodation and drug and alcohol use. The current

thesis provides promising findings that access to an in-cell computer contributes to improved connections, with the potential to support reduced reoffending.

Overall, the findings from Studies 2 and 3 collectively provide first evidence of the processes through which computer use leads to rehabilitative benefits. The integrated findings from the two studies provide support for the three proposed pathways of coping and resilience, self-governance, and connection. This contributes to the evidence base on personal computers in prison and informs policy, as will be discussed below in relation to research aim three.

Research Aim Three – Informing Policy

The third research aim of the thesis was to inform policy concerning technology in prisons. The systematic review that constituted Study 1 (Chapter 2) gathered and synthesized the available research on technology in prisons which has a rehabilitative purpose. At one level, the connection between the technological innovations in the study may appear weak, that is, the technologies look and sound different to each other and are chiefly associated by being classified as "technology". Despite their differences, common outcomes associated with each can be understood when viewed through Agnew's (1992) strain theory, in which it is proposed that negative prisoner behaviour arises from the strain of prison life, such as loss of freedom, sensory deprivation and reduced ability to purchase goods. The link between prison strain and prison misconduct was demonstrated in Morris et al. (2012), a study investigating the relationship between levels of violent misconduct in United States prisons and measures of deprivation in the prison. The study found that where deprivation levels were highest, violent misconduct levels were raised. Conversely, in the current thesis, in each of the 13 studies included within the systematic review, one or more aspects of prison strain were partially alleviated through prisoner access to the technology studied. For example, games and podcasts provided sensory stimulation, video visits allowed engagement with the outside world and wing-based computers enabled purchasing. In each study, positive outcomes were observed because of this alleviation of prison strain. The processes by which technology relates to positive

outcomes can also be viewed through the framework of primary and secondary stressors. Porter (2018) identifies primary stressors of imprisonment as being those experienced while in custody, such as challenging interactions with staff, threats from other inmates and isolation. The increased opportunities for connection that technology provides in addition to the alleviation of boredom, may assist with alleviating such primary stressors. Support for prosocial attitudes and improvements in behaviour in contrast, may support secondary stressors, experienced on release from prison, such as challenges with accommodation and employment. Overall, four of the synthesized findings from the review identified that technology in prison had positive outcomes associated with a rehabilitative environment. These findings were: improved mental wellbeing; assistance in managing sentenced time; increased prosocial thoughts, attitudes, and behaviours (including reduced reoffending on release); and improved relationships with others both inside and outside prison. In relation to research aim three, and the policy implications, the systematic review then informs policy more broadly than for the specific technologies included in the review. Where a novel technology reduces the impact of prison strain (Agnew, 1992) positive outcomes for prisoners may be expected, specifically in relation to the integrated findings described. The fifth integrated finding from the systematic review referred to the expectations that technology will function effectively, and the resultant frustration experienced by users when this was not the case. This was a finding experienced across technologies and was supported by Study 3, in which the theme “Rage Against the Machine” was described. This theme described prisoners’ frustration with the computers when they failed to operate effectively and reflected the difficulty of living in a digital prison without access to the digital functions. This is consistent with the theory of technostress (Shu et al., 2011). Shu et al. (2011) describe how stress and frustration can arise following the introduction of a technology; negative feelings are increased by dependence on the technology and decreased by efficacy in operating the technology. For policy makers, this highlights that attention should be paid to contingencies, if the technology fails. Further that support and training to use the technology

effectively, including resourcing staff with technical capabilities, may decrease the likelihood of stress and frustration.

The empirical studies, comprising an explanatory sequential mixed methods design, involving Studies 2 and 3, also inform future policy. Study 2 found a positive relationship between frequency of use of personal computers by prisoners and the outcome variables of wellbeing, and agency for desistance. The implications for policy in this instance relate specifically to the introduction of a particular technology: the personal computer, and in a particular location: within the prison cell. The installation of personal computers in prison cells, along with telephones in prison cells (Palmer et al., 2020), is the most significant technological change to the environment of the prison cell since the introduction of televisions in the late 20th century. Personal computers involve a significant financial investment for the prison cell environment and as discussed above in relation to aims one and two, provide the potential to improve outcomes for prisoners. The findings of Study 2 suggest that personal computers in prisons relate positively to indicators of a rehabilitative environment, such as wellbeing and agency for desistance. Previous research (Barkworth et al., 2022) found a negative relationship between quantity of use of in-cell personal technologies (tablets which included a phone call facility) and wellbeing, autonomy, and social climate. Notably, in the Barkworth et al. (2022) study, the tablets did not offer access to complete transactional tasks such as checking account balances, shopping, or topping up phone credit. As a result, the experience of using the tablets was likely to be that of a passive rather than an active participant. Escobar-Viera et al. (2018) have reported that passive computer use in community settings is experienced differently to active use, with the former being linked to anxiety and depression. Of relevance to policy makers, the differences in findings between the studies suggest that increased use of devices may be more likely to be rehabilitative if transactional functionality, enabling active participation, is enabled.

The location of the technology was also important, the systematic review and the empirical studies all identified advantages of locating technology within the prison cell. A recent survey of

6000 prisoners, in England and Wales revealed that over 60% of prisoners were locked in their cell for 22 hours a day or more on a typical weekend day, the comparable weekday figure being 42% (Taylor, 2023). In addition to the concerns that this has for prisoner wellbeing, practically the time out of cell was considered insufficient to complete essential tasks including making phone calls and submitting applications. While the desirable solution to this issue is to provide more time out of the prison cell, the size of the prison population relative to resource is unlikely to adjust conditions significantly on a short to medium timescale. Alongside striving to increase time out of cell, installation of technology should be considered to improve the quality of time spent in a cell. Technology can increase the variety of activities and tasks that can be engaged with during periods of being locked in a cell. The benefits of increased privacy when technology was located within the prison cell was an integrated finding in the systematic review, and the empirical studies also revealed prisoner reported benefits of the location through increased convenience, not needing to queue for a kiosk, and providing privacy. A recommendation for policy makers therefore is that the location of technological intervention is important, specifically when technology is placed in the cell it allows this time to be more mentally stimulating and productive.

Study 3 provides deeper understanding of the findings of the quantitative study, and insight into the individual experience of living with a personal computer when in prison. This study was a critical addition to those in the preceding chapters. While Studies 1 and 2 provided evidence of links between technology and pro-social indicators, Study 3 provided insight into the experience for people living with the devices. This study reported five themes representing participants experiences of in cell computers in the data, three of the themes were related to three of the integrated findings of the systematic review, linking technology to positive outcomes for people in prison. Specifically, the themes of “Making Good Use of My Time”, “Staying Connected When the Door Closes” and “Coping With Cell Time” had links to the integrated findings involving improving mental wellbeing, supporting relationships, and helping prisoners to manage time. This can be seen as positive confirmation that the current study supports and extends the previous literature base on technology

use for rehabilitative purposes within prison. The theme “Making Good Use of My Time” included a sub-theme of “An End to the Digital Deep Freeze of Prison”, providing evidence for technology enabling people in prison to progress in their digital literacy, and to avoid falling behind the community use of technology during their sentence. It is interesting that although this was an experience mentioned in the interviews, digital skill development was referenced by only a small number of participants in the survey distributed as part of the quantitative study. While this may be due to the way that the questions were asked in the different studies, it may also be an indication that the survey respondents were more likely to be relatively confident users of computers prior to their sentence. The qualitative study, which was carried out in person, gave voice to prisoners from enthusiastic to reluctant computer users, and therefore may have gathered the viewpoint of those whose digital skills had been enhanced by computer access. Further, it is possible that providing an answer relating to developing digital skills while using digital skills to complete a questionnaire would feel self-evident and less likely to be given spontaneously. Either way, for policy makers who are interested in advancing and maintaining the digital skills of prisoners, personal computers appear to be a positive tool to achieve this. A further sub-theme from Study 3, “Trusting the Ground You’re Standing on”, related to the increased confidence that people in prison felt towards their prison environment, because of access to the computers. The technologies were associated with prisoners reporting feeling they were living in a more procedurally just environment. This is an important finding, it is not self-evident that prisoners will place confidence and trust in machines, and to date there have been few studies exploring prisoner trust when using computers. The current study suggests that prisoners are willing to engage with and trust computers with their vital communications. Indeed, because of the enhanced visibility and control, the use of a computer appears to enhance the confidence that prisoners have in the prison more broadly.

In summary, the studies in this thesis inform policy in the following ways:

- Technology has the potential to influence rehabilitation, prisoner experience of the legitimacy of prisons and digital confidence, and likely more outcomes not yet explored. Policy makers should be clear as to the specific purposes of introducing technology to ensure that the design optimises the desired outcomes.
- When introducing technology, functions to allow active participation, such as transactional functions should be included to increase the rehabilitative effect.
- Where possible, technology should be placed in a prison cell to provide the advantages of convenience, privacy, and supporting prisoners to manage time when locked up, over technology available in communal areas.
- Clear strategies for supporting prisoners, prison staff and prison processes for occasions when the technology is not available or breaks down should be in place. These contingencies should form part of the planning phase prior to installation of the computers.

Strengths and Limitations

As well as responding to each of the aims effectively and providing valuable theoretical and practical insights, this programme of research has five additional methodological strengths that should be noted. Firstly, data was collected for Studies 2 and 3 at a time when personal computers had been installed at the two sites for a period of at least five years. McDougall et al. (2017) observed a fading of some of the positive outcomes of communal wing-based computers a period after it had been installed. The current studies were conducted when the computers were no longer a novel addition to prison life, providing greater confidence in the findings. A second strength was the size of the sample available for Study 2. The prisons involved in the study held a total of 2685 people, providing a substantial pool of participants and supporting the method of analysis employed. This is important to reduce the chance of Type 2 errors (Smith, 2012), through which a small sample size may incorrectly find that a difference between variables is not present, due to the sample size inadequately representing the background population. Thirdly, the size of the prison

population at the two sites for the studies provided variation in the participant pool, the results can therefore be considered applicable to men held in category C prisons, from a range of ages and ethnicities. Fourthly, the data for Study 2 was collected directly via the computers, this provided a reliable method of data collection relative to a paper-based system. This novel method of data collection within a prison setting provided a further benefit for future research in that it tested the viability of the use of the survey tool for academic research. Several barriers were experienced, for example in relation to formatting the survey and exporting the data, the solutions to which will be of value for future researchers. These observations have been shared with the survey tool designers and amended in subsequent software updates. Finally, the use of mixed method research design allowed for a more comprehensive understanding of the research problem than a quantitative or qualitative study alone would have allowed. The sequencing of a qualitative study following a quantitative study, enabled the latter results to be explained through the experiences of those with access to the in-cell computers.

There were also limitations to the findings of the thesis. There were four key limitations that related to the programme of research as a whole. Firstly, the data for Study 2 was collected cross-sectionally, with each participant contributing at a single point in time. This design does not allow for a comparison of variables measured between time points for each participant, which would provide insight into the sequencing of how mediators act on outcome variables. Kline (2015) describes the limitations of mediation analysis and specifically the weakness of applying this technique to cross-sectional study designs in which all data is collected at the same time points. Data collection at different points was not possible in the current study due to practical restrictions of time and resource. However, prior understanding of the literature in the field was used to support the direction of relationships in the specified models. Future research may consider exploring a longitudinal design to address this issue. Further, statistical significance within the indirect pathways of mediation models is not definite confirmation of the pathways, for example, the effects seen could be due to co-variance between the variables or a separate non-observed variable being

correlated with the current variables. To mitigate these factors, insight into the likely pathways were included through the previous literature and the researchers direct work within the field (Danner et al., 2015). Secondly, the data for Study 2 relied on self-report by participants. An objective measure of computer usage would have added confidence that results were not influenced by correlation through common method variance (Podsakoff et al., 2003). Similarly, objective outcome measures, such as reoffending rates would provide a direct indicator of future success on release from prison that was not possible to ascertain through the methodology of Study 2. Thirdly, there are limits to the generalisability of the studies. Participants in Study 2 and Study 3 were prisoners living in adult male prisons in England and Wales and the reports for Study 1 were only considered if written in English. The findings may not therefore be applicable to penal systems outside of England and Wales, to other populations such as women and children, or to countries outside those included in the studies. Further, the studies collected data from a prisoner perspective, thus the thesis does not explore prisoner and officer relationships from the perspective of the officer, to understand if any positive or detrimental observations are identified from this alternative perspective. Future research would benefit from examining this staff perspective, to include exploration of staff views of the ethical propriety of providing prisoners with access to what may be perceived as a luxury item, and any consequential impact on the staff prisoner relationship. Finally, interpretation of the data for Study 3 was inevitably shaped by the researcher's background and world view, which has been influenced through working as a psychologist in prisons for over 20 years. Although this subjective stance is not problematic in reflexive qualitative methodologies, it is acknowledged that a researcher with a different background may have made different interpretations of the data and indeed may have designed the study to explore different research questions. The philosophical research position taken, of critical realism, influenced the design and interpretation in that the data collected attempted to represent the truth of the assumed underlying reality but with reflection on the interpretive processes and research position acknowledged.

While not a limitation of the current study specifically, as the scope is beyond the psychological experiences of technology use by people in prison, it is of note that the introduction of technology to prison brings potential security concerns. A serious breach in security, occurring due to the use of a computer within prison, could pose a threat to the continued implementation or wider roll out of the technology. The current study did not seek to build knowledge related to security threats, but it is recognised that this would be valuable to avoid an existential threat to the use of technology in prisons.

Suggested Future Research

Following on from the limitations described in the previous section, a future programme of research is recommended to address some of the identified limitations and to build on the findings of the studies. The recommended programme of research would include the following studies:

1) It is recommended that future studies include women, children, and categories of prison other than category C. Further, that research explores where the computers are of most value, to assist in prioritising the order of installation roll-out. For example, whether it would be most beneficial to install computers at reception[13], training, or resettlement prisons.
2) To address the limitations of the design in the current study it is recommended that research is completed involving data collection at different points in time, to increase confidence in the sequence that the mediating variables operate within the relationships identified. Objective measures of computer use and outcome measures of rehabilitation, such as reoffending rates, should be incorporated to build on the current findings that indicate positive outcomes following computer installation.
3) Both Study 2 and Study 3 found that the email-a-prisoner and internal messaging functions were significant in relation to building connections with those outside prison. Further

[13] Prisons in England and Wales are categorised by security level (A-D) and also by function. The functions are reception prisons (taking prisoners from court), training prisons (providing education and employment opportunities) and resettlement prisons (for prisoners close to their date of release).

research investigating different forms of communication, such as telephone, video, text, and email would be of value to better understand how connection is best supported via a personal computer. Study 3 highlighted that some prisoners found the communication functions on the computer to decrease feelings of isolation. Research exploring whether the ability to email friends and family predicts a lack of isolation, or increased feelings of connectedness would be valuable, and in turn if this predicts variables such as wellbeing or agency for desistance.

4) Within the mediating variables explored in Study 2, personal control and growth were the strongest pathways. Research investigating which functions on the computers influence these pathways would allow the computer content to be designed to have the strongest impact on these processes.
5) Currently there is little guidance for content designers as to which type of media is likely to be most effective at influencing outcomes. Further investigation into content that appears to have the strongest influence on desired outcomes, and conversely content which has a negative influence would be helpful.

Conclusion

This thesis has contributed three unique studies to address gaps in the knowledge base relating to technology in prisons. While Study 2 and Study 3 specifically focused on the technology of personal computers in prisons, the findings from these studies, in addition to those from Study 1 are relevant to the theory of technology use in custodial settings more broadly. Through exploring the psychological mechanisms by which the technology is operating, the findings can be applied to other technologies which operate on the same areas. Specifically, the findings of the empirical studies indicate that technologies that provide support to cope in prison, that provide opportunities for prisoners to self-govern, and that increase the opportunities for connection between prisoners and others, are likely to provide an environment supportive of rehabilitation.

As a result of the acceleration of technology adoption in the community, boosted further during the COVID pandemic, the digital divide between people in the community and people in prison has never been greater. Efforts to address this divide, to better prepare people in prison for a smooth and successful transition on release require the provision of access to technology while in prison. Indeed, through providing such access, prisons also serve as a route to reduce the digital divide that exists due to social disadvantage. This thesis finds that prison has the potential to provide a digital bridge across the divide through the installation of personal computers in prison cells. The studies in this thesis also provide insight into the processes through which technology leads to beneficial outcomes and contributes a theoretical model of change.

Overall, the findings support the inclusion of technology within prison design to provide a rehabilitative environment. As the first academic study to gather data via the in-cell computers within HM Prison and Probation Service, the thesis also describes a novel research tool with the potential to alter the way that research takes place within prisons.

Chapter 6 - Individual Learning Plan Summary

During the period that the research for this thesis was carried out, I kept an account of reflections about my development as a doctoral researcher, within an individual learning plan document. This chapter summarises these reflections on researcher development mapped against the four domains of the Vitae Researcher Development Framework (RDF), (Vitae, 2010). The full reflective document can be found at Appendix H.

Domain A: Knowledge and Intellectual Abilities

Domain A concerns the knowledge and abilities required for effective research. The skills explored within this domain include an understanding of the knowledge base, to include the subject area and the research processes. It further includes cognitive skills, including analysis, interpretation, and critical thinking. Finally, it outlines required skills of creativity within the research approach.

At the beginning of my studies in 2019, my research skills were rusty and dated. My research background had included more opportunity for quantitative than qualitative research. Reviewing my reflective entries over the period of study, the development of my knowledge base, RDF sub-domain A:1, is clear. Specifically, I have revisited my quantitative research knowledge, and built on this further through an understanding of advanced regression modelling. I used the software package R for my analysis, which was a new tool for me. I enjoyed learning about R and found that using it required a clear understanding of the analysis I was carrying out, relative to point and click software, and as a result I feel more confident in my understanding of the approaches I used than I might otherwise have been. I consider this to be a valuable tool for application in my future research, with the added advantage of it being free to use. A further significant knowledge development was gained by my completion of qualitative research. Through the workshops available as part of the course, self-study, and close reading of published papers (which has also enabled my development of RDF sub-domain A:2, cognitive ability), my position on the purpose and value of qualitative research has adjusted. Having reflected on my preferred epistemological position, I have identified

inconsistency between the individual formulation-based approach that I value within my psychological practice and what I now recognise was a leaning towards positivist appreciation in research. On reflection, a position which acknowledges the complexities of individuals within research and recognises the role of the researcher and the history of the participant parallels my preferred approach within a therapeutic alliance, leading me towards a more interpretivist position. I have particularly enjoyed the opportunity to express sub-section A:3, that of creativity through the application of a qualitative research approach. I found the process of analysing the qualitative data, identifying themes, and generating theme names to be an opportunity to apply an inquiring and innovative approach to developing insight. The approach also facilitated openness to unexpected findings and interpretations, relative to a positivistic research stance.

This domain also includes the development of my knowledge within the field of human interaction with technology. While I had an existing curiosity about the topic and a recognition of the need for study, this period of research has allowed me to engage deeply with the subject matter and to reach a level of expertise within the knowledge area of technology within prisons. My developing subject knowledge has satisfyingly coincided with an interest from policy makers and professionals in this area, in part generated by a need for remote completion of tasks during the COVID pandemic. I have been able to apply my knowledge of prison and prisoners through my practitioner work to understanding the literature base in this area.

Overall, my knowledge and intellectual abilities have progressed through phases of the RDF on all three sub-domains within Domain A.

Domain B: Personal Effectiveness

Domain B of the framework describes the skills required for self-management and personal development of the researcher. These skills include personal qualities, such as enthusiasm and integrity, self-management skills, such as time management and maintaining a work life balance, and professional development skills, such as continuing professional development and networking.

When considering the sub-domains at the outset of the course, I recognised some of the personal qualities of the RDF (sub-domain B:1) which I had developed during my education and career to date, such as enthusiasm, perseverance, integrity, and self-reflection. My goal was to apply these to a researcher role and to further develop the areas B:2: self-management, and B:3: professional and career development, within the sphere of a researcher role.

I enrolled on the Doctorate in Forensic Psychology in September 2019. In March 2020, the COVID pandemic began to impact on the United Kingdom (and internationally), therefore most of my period of study has been impacted by the consequences of this event. Reviewing my reflective entries for domain B has highlighted my implementation of the personal qualities described in sub-domain B1, such as perseverance and self-reflection. The demands of my role as a Forensic Psychologist increased during this period due to the need to adapt working practices, requiring reflection on the time slots that I protected for research within the week and regular self-checks of my own wellbeing to ensure that I was maintaining a healthy work life balance. Due to the increase in my working hours during the pandemic, I moved the time that I protected to the mornings. This enabled me to protect time for my studies when I was less tired, which was achieved more easily than later in the day, as my paid employment demands could extend into the evening. Through attending to and applying self-management skills, such as creating a weekly plan for the slots when I would complete work for my doctorate (sub-domain B:2) my research provided a welcome alternative to the pressures of my practitioner role. By continually reviewing my approach to study I was able to maintain my drive and interest in my research and boost my feelings of wellbeing.

At the outset of my studies, my network of colleagues interested in technology related to custodial settings was limited. I identified early in my individual learning plan a goal to develop my profile as a researcher with expertise in my chosen field of study. Through building professional links, joining relevant meetings and identifying opportunities to discuss my studies I have developed a reputation as a person holding knowledge in this area. As a result, I have been approached for

advice in relation to application of the knowledge base to practice, supervision of future research projects and to lead networks of interested professionals. I consider this a positive platform from which I hope to continue building in the future.

In summary, reflecting on the skills involved in domain B of the RDF, I have translated pre-existing skills from practitioner to the researcher role, and have developed my network of colleagues and reputation as a researcher within the field of technology in custodial settings.

Domain C: Research Governance and Organisation

Domain C of the framework concerns skills relating to understanding the standards and organisational skills required for research. These include skills of professional conduct, such as understanding and adhering to ethical and legal requirements, skills of research management, such as project planning, and skills to manage the finances and resources required for research.

I was keen to use the opportunity of my period of study to expand my skills across research governance and organisation. In relation to sub-domain C:1, professional conduct, some aspects parallel skills that I have developed through my 20 years working as a practitioner. These include assessing risks of an activity in relation to health and safety, exploring ethical considerations of planned actions and managing data with integrity. In relation to sub-domain C:2, research management, I began considering aspects related to this sub-domain, from the earliest point in applying to enroll on the course when requesting funding to support my fees. For example, I ensured that the research area that I was planning to study aligned with the research priorities of the organisation. Although I began planning my project from the initial stages of my studies, the changing landscape of the COVID pandemic required regular revisits and adaptations to my project plan. One such adaptation included reconsidering and revising the planned sequence of my studies, influenced in part by the moratorium on face-to-face data collection that was in place at points of the pandemic. This meant that I began by collecting the data for the quantitative study (which was via a remotely delivered survey) and followed up with the data for the qualitative study. By setting

clear priorities and objectives of the research within the project plan I was able to consider pragmatic adaptations that retained the intended aims of the research.

Fiscal management was also necessary, given that my fees for the course were provided for a limited period by my employer. Requirements of the fee payment included an annual review of the research progress and to have completed the research within the agreed period. During my research I have updated those providing my funding with changes to my planned research and with interim updates on progress made. This has enabled a secure funding stream despite the necessary research adaptations due to the pandemic.

This is a research domain that I found included some parallel pre-existing skills I could apply from my work as a practitioner, such as project planning and resource management. I have enjoyed the opportunity to apply these within a research setting and further to develop the sub-domains which were specific to the role of a researcher.

Domain D: Engagement, Influence, and Impact

The final domain refers to skills required to influence the wider academic and social community. This domain includes skills of working with others, such as operating effectively in a team and demonstrating leadership, skills of communication and dissemination, such as using a variety of communication methods and writing for publication, and further, skills of engagement and impact, such as public engagement and policy influence.

Designing research that is of value to influencing policy in the field and to provide practical value was a personal priority. From the outset of my studies, I sought to build contacts across HM Prison and Probation Service (HMPPS) and with others carrying out research in the same or related fields, within the RDF sub-domain of D:1, working with others. As a result of this approach, I am now part of three boards relating to technology use in prisons, one of which I set up and for which I am the Chair. This network has allowed me to share my ideas for my research design and incorporate

suggestions from others, to understand other research in progress, and to share initial findings from my research.

Over the period of my studies, I have engaged in parallel projects to develop my communication skills, as described in the RDF sub-domain D:2, communication, and dissemination. I accepted an invitation to author a book chapter on deliberate fire setting, this provided an opportunity to develop skills of writing for publication, including critical reading and writing, working within a word count, and referencing. The process of writing the book chapter, along with receiving feedback from my supervisors on my writing has enabled me to tighten my writing and critical reading skills, over the period of my studies. I have more recently received and accepted an invitation to contribute a book chapter on technology in prisons to a proposed book on forensic psychology. I have also engaged in a number of projects which have developed my media communication skills, co-hosting two series of the *Forensic Psychology Podcast* (a podcast for professionals interested in Forensic Psychology), which has over 100,000 downloads; co-hosting two series of *Behind the Crime* for BBC Radio 4 (a radio show interviewing guests who have spent time in prison); and co-hosting a series of *Thinking Matters* (a psychology-based programme broadcast in prisons). These projects have highlighted to me the value of providing information in a variety of formats, to engage different audiences and to communicate complex ideas in a concise manner. I have applied this approach, of engaging a variety of audiences, to the outcomes of my doctorate research, adapting the forms of communication. For example, I presented the findings of my research at the British Psychological Society Division of Forensic Psychology conference 2022, and at the British Psychological Society Cyberpsychology conference 2022. I found the process of preparing for each of these presentations allowed me to reflect on how my research applied to these different fields of psychology, and how to communicate this to these different audiences. More recently I have begun considering journals for publication, to ensure that my research is peer reviewed and placed in an accessible format within academic literature.

The final sub-domain, D:3, engagement, and impact, though last on the list is the first in terms of my personal motivation for undertaking the research. Throughout my studies I have considered how my research might contribute to improving the prison experience for those in our community who spend time in custody. Through the links I have built during my studies, there is a strong appetite to understand the findings of my research, in order to inform future investment in technology. I was recently invited to present my research findings to the HMPPS digital board, the content of which formed part of the submissions to government for the 3-year spending review. It was an opportunity to think carefully about how to present statistical approaches which might be unfamiliar to listeners, and to communicatewhat the research does and does not explain. It prompted me to consider other creative ways of sharing my research findings, because of which I have developed a two-minute animation. I plan to use this to promote my research to audiences who may not be reached through academic journals or formal papers.

Final reflections

I have valued the opportunity to maintain a reflective document throughout my studies, the full version of which can be found in Appendix H. I have found the RDF format helpful in prompting me to consider the range of skills involved in research. It is satisfying to see the progress that I have made in moving through phases of the sub-domains; I would like to consider this a starting point from which I can develop further over the remainder of my career.

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Appendix A

Protocol for Systematic Review

What are the psychosocial factors impacted by technological infrastructure innovations in prisons? A systematic review.

Citation

Sally Tilt, Mhairi Bowe. What are the psychosocial factors impacted by technological infrastructure innovations in prisons? A systematic review. PROSPERO 2020 CRD42020218284 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42020218284

Review question

What are the outcomes of technology innovations which adjust prison infrastructure or environment for prisons and those living in prisons?

Searches

Web of Science

PsycINFO/PsycARTICLES

Scopus

LISTA

Criminal Justice Abstracts

Academic Search Complete

In addition, grey literature will be searched (HMPPS NRC database), Google Scholar, databases of unpublished theses.

All dates included.

Exclusions:

Studies not published in English.

Opinion articles

Book chapters which do not involve an evaluation of an intervention.

(Prison* or jail or gaol or custody) and (internet or tele* or video or computer* or tv or device or digital or intranet or kiosk or phone or technolog*)

Types of study to be included

Qualitative, quantitative and mixed method studies. Studies which involve evaluations will be included - opinion pieces which do not include an evaluation of an intervention will not be included.

Condition or domain being studied

Technological innovations in prison infrastructure, such as televisions, computers in cells, internet access in libraries, that are intended to impact on the experience of living and working in prison. This systematic review aims to synthesise the current available evidence for the impact of the introduction of such innovations across the world. This review does not aim to explore the impact of technological innovations which are used as direct alternatives to non-technological therapeutic interventions, for example therapy delivered by video conferencing or e-health interventions.

Participants/population

Studies will be included if the participants in the study are people living or working in prisons.

Included studies:

Participants should be of an age to serve a sentence in prison, or equivalent sanction for younger age individuals (the age of criminal responsibility varies between countries, in addition to the age at which convicted individuals serve sentences in prison) - in the UK, this would be a minimum of 10 years of age for conviction.

Articles will be included if they are published in English.

Articles will be included if the subject of the studies are changes to the environment or climate due to a technological innovation (such as television, phones, computers, internet access etc.).

Studies can be in any country.

Excluded studies:

Articles which explore psychological interventions, delivered via technology, which is focused on providing therapy for an individual.

Articles which involve participants not based in a prison.

Articles published in any language other than English.

Intervention(s), exposure(s)

Technological innovations in prison infrastructures such as computers in cells, access to the internet, use of telephones, access to kiosks have been introduced to varying degrees at different prisons. These innovations carry financial costs and bring additional security challenges to prisons. Additionally, they provide the potential to achieve a more rehabilitative environment, to introduce resource efficiencies and to prepare those serving sentences for life on release.

Included studies:

Articles which involve the introduction of a technological innovation within a prison setting.

Excluded studies:

Articles which involve the use of technology for the purpose of psychological intervention (for example, providing therapy via video conferencing, or accessing online therapeutic interventions.

Comparator(s)/control

N/A

Context

Studies will involve prisons and technological innovations relating to the environment or infrastructure of the prison.

Main outcome(s)

Outcomes for prisons and for those living and working in prisons. It is anticipated that outcomes will be in a variety of formats and therefore specific outcomes are not required for inclusion.

Measures of effect

All outcomes will be considered.

Additional outcome(s)

Not applicable

Measures of effect

Not applicable

Data extraction (selection and coding)

Stage one: Articles which are found through the search process will be reviewed and duplicates removed.

Stage two: Titles and then abstracts of articles will be inspected by reviewer one, with inclusion criteria applied. Up to 5% of the articles will be reviewed by a second reviewer for quality assurance.

Stage three: Full texts will be obtained for the articles screened in after stage two. These will be reviewed by reviewer one using the inclusion criteria. Up to 10% of the articles will be reviewed by second reviewer. Disagreements will be resolved by discussion.

Retrieved literature will be reviewed and duplicates removed.

Stage four: data will be extracted from the studies selected at stage three. The data extracted will include design of study, participant details, type of technological innovation, outcomes measured, results of study, conclusions. Data extracted will be entered onto a bespoke excel spreadsheet, and RefWorks will be used to keep track of the articles.

Risk of bias (quality) assessment

A quality assessment form will be developed, to suit the types of studies included, to apply to the studies to attempt to avoid bias. The checklist will be guided by the appropriate Critical Appraisal Skills Programme Checklist.

The assessment of quality, following the checklist, will be carried out by the first reviewer. A second reviewer will conduct a screen of the process to ensure that the method has been appropriately applied.

Strategy for data synthesis

Given the anticipated mixed nature of the studies that are likely to be included in the final sample, a narrative synthesis approach is planned. This method will allow for the identification of a theory for how the intervention works, a synthesis of the main findings, an opportunity to explore relationships in the data and further to consider the robustness of the findings. These four aspects are described further in the guidance for carrying out narrative synthesis within a systematic review, (Popay, Roberts, Sowden, Petticrew, Arai, Rodgers, Britten, Roen & Duffy, 2006).

Analysis of subgroups or subsets

No planned investigation of subgroups.

Appendix B

Survey for Quantitative Study

Thank you for agreeing to join in the survey.

The first questions are about you:

How old are you?

How long have you been in prison on this sentence (in months)?

How many months is it before you are released (at the earliest opportunity)?

Which of the following would you use to describe your ethnicity (please circle)?

White

- English, Welsh, Scottish, Northern Irish, or British
- Irish
- Gypsy or Irish Traveller
- Any other White background

Mixed or Multiple ethnic groups

- White and Black Caribbean
- White and Black African
- White and Asian
- Any other Mixed or Multiple ethnic background

Asian or Asian British

- Indian
- Pakistani
- Bangladeshi
- Chinese

- Any other Asian background

Black, African, Caribbean, or Black British

- African
- Caribbean
- Any other Black, African, or Caribbean background

Other ethnic group

- Arab
- Any other ethnic group

The next questions ask you about how you tend to use the computer. Please think about the nature of your computer use over the last two weeks to help you answer the following questions. Please select the response that fits your experiences best.

In the last two weeks:					
How often have you used your in-cell computer?	never	rarely	sometimes	often	always

How often have you used your in-cell computer to play games (for example, Solitaire or Mimstris)?	never	rarely	sometimes	often	always
How often have you used your in-cell computer to listen to the radio?	never	rarely	sometimes	often	always
How often have you used the like button on an article on your in-cell computer?	never	rarely	sometimes	often	always
How often have you used the dislike button on an article on your in-cell computer?	never	rarely	sometimes	often	always
How often have you added a comment to an article on your in-cell computer?	never	rarely	sometimes	often	always
How often have you watched factual programmes (for example a nature documentary) on your in-cell computer?	never	rarely	sometimes	often	always
How often have you watched cartoons (for example, 'Bob and Beyond') on your in-cell computer?	never	rarely	sometimes	often	always
How often have you talked about something that you have watched on your in-cell computer with friends or family outside prison?	never	rarely	sometimes	often	always
How often have you watched videos linked to your health on your in-cell computer (for example fitness videos or healthy mind and body videos)?	never	rarely	sometimes	often	always
How often have you watched videos relating to religious beliefs on your in-cell computer?	never	rarely	sometimes	often	always
How often have you checked the balance in your account on the in-cell computer?	never	rarely	sometimes	often	always
How often have you downloaded a Prison Service Order or Prison Service Instruction on your in-cell computer?	never	rarely	sometimes	often	always
How often have you used the in-cell computer to help with shopping (for example using the Sportsdirect or other catalogues)?	never	rarely	sometimes	often	always
How often have you watched any videos from the Governor on your in-cell computer?	never	rarely	sometimes	often	always

How often have you watched any videos from other Prison Managers on your in-cell computer?	never	rarely	sometimes	often	always
How often have you used your in-cell computer to make a complaint?	never	rarely	sometimes	often	always

Can you tell us about any other purpose that you use the computer for?

What do you like about having an in-cell computer?

What do you dislike about having an in-cell computer?

How do you think the in-cell computer could be improved?

The next questions ask you about the kind of experiences you have in your life at the moment. Please read each of the following items carefully and select the answer that best reflects your feelings. Please try to answer all the questions.

Please choose from 1 to 5 to indicate the degree to which the following statement is true for you at this point in your life.

I feel a sense of choice and freedom in the things I undertake.	Not at all true	Rarely true	Sometimes true	Often true	Completely true
Most of the things I do feel like “I have to”.	Not at all true	Rarely true	Sometimes true	Often true	Completely true
I feel that my decisions reflect what I really want.	Not at all true	Rarely true	Sometimes true	Often true	Completely true

I feel forced to do many things I wouldn't choose to do.	Not at all true	Rarely true	Sometimes true	Often true	Completely true
I feel my choices express who I really am.	Not at all true	Rarely true	Sometimes true	Often true	Completely true
I feel pressured to do too many things.	Not at all true	Rarely true	Sometimes true	Often true	Completely true
I feel I have been doing what really interests me.	Not at all true	Rarely true	Sometimes true	Often true	Completely true
My daily activities feel like a chain of obligations.	Not at all true	Rarely true	Sometimes true	Often true	Completely true
I get the emotional support I need from other people	Not at all true	Rarely true	Sometimes true	Often true	Completely true
I get the help I need from other people	Not at all true	Rarely true	Sometimes true	Often true	Completely true
I get the resources I need from other people	Not at all true	Rarely true	Sometimes true	Often true	Completely true
I get the advice I need from other people	Not at all true	Rarely true	Sometimes true	Often true	Completely true
I feel in control of my life.	Not at all true	Rarely true	Sometimes true	Often true	Completely true
I am free to live my life how I wish.	Not at all true	Rarely true	Sometimes true	Often true	Completely true
My experiences in life are due to my own actions.	Not at all true	Rarely true	Sometimes true	Often true	Completely true

Please indicate the degree to which you agree with the following statements:

No matter what I do to try to stop, I'm doomed to never be able to stop committing crimes	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Things have been bad for me in the past, but I can work to turn things around and live a crime-free life if I want to.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I feel helpless when I try to stop myself from committing crimes; the world always somehow forces me to keep going back to crime.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
When my goal is to stop committing crimes, I'm in charge of whether I reach that goal or not.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I have recently been able to learn how to stay away from crime and do things I never thought I'd be able to do.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
There are people in my life who respect me for the steps I've taken to keep myself away from crime.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
When I get involved in doing things and hanging out with people that keep me away from crime, I feel like I'm part of something powerful.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
When I try to stop myself from doing crime, there are too many things that stop me from doing what I'm trying to do.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I'm smart enough to be able to learn skills and anything else I need to learn to help me live a crime-free life.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
When I was committing crimes, I was good at getting what I wanted. Now that I'm trying to go straight, I believe I can be good at this, too.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
What I am learning in this prison is helping me.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

Officers here allow me some space.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I feel I am making progress at this prison	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I work at my future at this prison	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
This prison is helpful for me.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
What I learn at this prison will help me when I'm outside.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I learn the right things at this prison	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I know what I am working at while at this prison	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Life is meaningful at this prison	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I trust the officers in this prison	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Staff in this prison often display honesty and integrity	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
When I complain about something, the staff here take it seriously	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
The staff here treat me with respect, even if I am angry	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

When I have a problem, there is always somebody I can turn to	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
The staff here pay attention to me and respect my feelings	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
The staff here treat me with respect	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
There are always enough people to help me	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I trust the staff here	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Complaints are being taken seriously	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
We regularly discuss things with the staff here	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
The staff here don't have enough time for me	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Taking initiative is welcomed by the staff here	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
The staff here show respect to me	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

And finally, please answer the questions below:

I've been feeling optimistic about the future	None of the time	Rarely	Some of the time	Often	All of the time

I've been feeling useful	None of the time	Rarely	Some of the time	Often	All of the time
I've been feeling relaxed	None of the time	Rarely	Some of the time	Often	All of the time
I've been dealing with problems well	None of the time	Rarely	Some of the time	Often	All of the time
I've been thinking clearly	None of the time	Rarely	Some of the time	Often	All of the time
I've been feeling close to other people	None of the time	Rarely	Some of the time	Often	All of the time
I've been able to make up my own mind about things	None of the time	Rarely	Some of the time	Often	All of the time

Thank you for taking part in the survey – your participation is very important.

If this survey has raised any concerns or worries, please share this with a member of the prison staff.

If you change your mind about participating in the survey, you can ask for your information to be withdrawn from the survey by writing to:

Psychology Department, HMP Hewell, Redditch, B97 6QS

To ensure that we are able to identify your response, in a way that does not identify you, please answer the following questions:

What day of the month is your birthday (e.g., 16)?

What are the first 3 letters of the town or city where you were born (e.g. Lon)?

(This information will only be used to identify your response if you wish to withdraw from the survey. You will need to tell us this information if you write to us to ask to withdraw from the survey).

Appendix C

Video Script Used by Researcher to Communicate Information About the Survey

Hello - I'm Sally Tilt

I'm really interested to find out what it is like to live in prison with a computer in your cell. You'll know that you're in a relatively unusual position – most people in prison do not have access to a computer to check their balance, order their meals, or watch videos.

I'd like to know more of what you think about the computer that you're watching this video on. I am carrying out research to hear from people using the computers and would really like to hear your views.

This is important because it will help people who design the computers to include more of what is good and change the things that are not so good.

Everyone is different and what you enjoy or dislike about the computers may be different to the person who lives next to you, so hearing from a range of people is important. It also does not matter if you do not use the computer very much or use it a lot- I'd like to hear from everyone.

So, what is involved? The research involves filling in a survey, which you can find via the notifications on your computer. It will take about 10 minutes of your time.

I will write a report about the research – to share the results of what I find. Your answers will be joined with everyone else's, and it won't be possible to know who gave which answers.

Completing the survey is voluntary – and you can ask to withdraw your answers if you change your mind.

Thanks for listening to this. Please take a look at the survey if you'd like to join in.

Appendix D

Notice to Prisoners Providing Participant Information for the Survey Study and Seeking Consent

Information for participants:

- **Why are we asking these questions?**

You have a computer inside your cell. We would like to know more about what you think about the computer and how you use it.

Your answers will be used to tell us what is helpful about the computers. It might also tell us things that could be changed or made better about the computers.

It does not matter if you tend to use the computer a lot or not very often. It is helpful to know more about everyone's thoughts on the computers.

- **Who will see the answers?**

Your answers will be grouped together with everyone else who answers the survey and will be seen by the researchers who are carrying out this study.

The data may be used for published research reports and presentations but will only be reported in an anonymous format. Your data will be stored securely and confidentially and destroyed after a maximum of ten years. If you use the survey to type information about yourself or anyone else, which raises concern for your safety or that of anyone else, this information may be passed to the security department at the prison.

- **Do I have to complete the survey?**

This is a voluntary survey – it is your decision whether to answer the questions. This is no advantage or disadvantage to you personally if you complete the survey.

- **What are the good things about joining the survey?**

If you tell us what you like about the computer – the prison can continue putting this on the computer. If you tell us what could be improved, this could be added to the computer.

Your answers might also help us to understand how if computer seems to change the way that people think or feel about their time in prison.

- **What are some of the downsides about answering the questions?**

There are a number of questions to answer, and it will take around 10 minutes of your time. You might find that you get tired of answering the questions (it is helpful if you get to the end – you might want to take a short break and come back to it if this happens).

Depending on your reading ability, you may find that some of the questions are hard to read, if you are unable to read and understand this information sheet, or the any of the questions, please do not continue with the survey.

If you leave the survey and return to it later, you will need to begin again from the start.

If you feel worried or anxious after completing the survey, please speak to a member of prison staff.

- **What if I change my mind?**

If you change your mind while answering the questions, your answers will not be included in the study, click the button 'I wish to exit' and your answers will not be included in the study. You can also withdraw from the study for up to 1 month after you have submitted your answers. After this point, your answers will be part of the data set and it will not be possible to remove your answers. You do not have to answer any question that you do not wish to.

Consenting to participate in the study:

I understand what is involved in taking part in this study. I understand that my answers will be anonymous and that I can change my mind about	Yes / No

participating up to one month after submitting my answers. I have read and understood the information about the study and agree that my answers can be used in this research study and in subsequent publications in an anonymous form.	

Appendix E

Participant Information Sheet to Participate in Interviews

Title of Study: What is it like to live in a prison with in-cell computers?

About the study

The research will aim to find out what it is like to live in a prison with in-cell computers.

It will focus on prisoners' experiences of using the in-cell computers.

The goal of the study will be to understand how prisoners use their in-cell computers and to help design future prisons.

Some questions you may have about the research project:

Why have you asked me to take part and what will I be required to do?

You have been invited to take part because you live in a prison where in-cell computers are available to prisoners. If you take part in the study, you will be invited to a one-to-one interview where you will be asked about how you use the computers. The interview will take about 45 minutes. The sound of the interview will be recorded.

What are the good things and bad things about taking part?

Your answers will help people to make decisions about providing in-cell computers for prisoners.

You will attend an interview for 45 minutes where you will be asked questions about using the computers. You may find this a little tiring, and you may miss the activity that you would normally be taking part in.

What if I do not wish to take part or change my mind during the study?

Your participation in the study is entirely voluntary. You are free to withdraw from the study without having to provide a reason for doing so. You can do this by contacting the researcher at the address

below, up to two weeks after the interview. You do not have to answer any question that you do not want to, and you can decide to leave the interview at any point.

What happens to the research data?

After the interview the recording will be typed up. At that point any names or things that could identify who you are will be removed. I will be looking at your interview transcript alongside other participant's interviews to look for common themes in the data. Your data will be handled only by members of the research team, in line with data protection principles and our approved research protocol. The audio files will be deleted once they have been transcribed. The data will be securely stored for a maximum of 10 years after the research is completed.

How will the research be reported?

The report from the research will be used by Sally Tilt within her Doctorate Thesis. It will also be shared with HMPPS to help them with decisions about in-cell computers in other prisons. It may also be published in a journal or presented at a conference.

Confidentiality

The answers that you give during the interview will be anonymised – your name and any other details that someone could identify you with will be removed. It may be that something you say in the interview is quoted in one of the final reports – in these cases, you may be able to recognise something that you said, but others will not be able to identify you.

If during the interview, you tell me that you are planning to harm yourself or others, or that you intend to break the prison rules, or that you tell me details about a crime that you have not been convicted for, I will pass this information on to others.

How can I find out more information?

Please contact the researcher:

Sally Tilt

Address removed for thesis publication.

This research is supervised by:

Dr. Mhairi Bowe

Nottingham Trent University

I have read and understood the nature of the study.

I understand my participation is voluntary.

I agree to take part in this study.

Signature_____ Date_____

Appendix F

Participant Debrief Sheet Following Interviews

Thank you for your time today and for sharing your views on the in-cell computers at this prison.

This research study is hoping to understand how prisoners use the in-cell computers, whether they use the computers for particular tasks and whether it alters their experience of prison (compared to living in a prison without in-cell computers).

The information that you provided will be added to that from other prisoners and combined to form a report. This will be shared with people who make decisions about putting in-cell computers in prisons. It will also be used for the researcher's doctorate thesis. The audio recording will be typed up, once this is done, the recording will be deleted. The data will be securely stored for up to 10 years after the end of the study.

The answers that you give during the interview will be anonymised – your name and any other details that someone could identify you with will be removed. It may be that something you say in the interview is quoted in one of the final reports – in these cases, you may be able to recognise something that you said, but others will not be able to identify you.

If you decide after today that you do not want your answers to be part of the research – you can choose this. To withdraw you answers, please write to the researcher using the details below, within 2 weeks of your interview.

If after the interview you feel worried or sad, please speak to a member of staff and ask for help.

If you have any questions about the study – or would like to find out more about research studies on computers on prisons, you can contact the researcher below:

Sally Tilt

Address removed for thesis publication.

This research is supervised by:

Dr. Mhairi Bowe

Nottingham Trent University

Appendix G

Semi-Structured Interview Schedule

Qualitative interview schedule:

Date:

Time started:

Time finished:

Participant name:

Participant establishment:

Participant ID:

Age:

Questions	Rationale
Thank you for agreeing to talk with me today. I am researching the experience of living in prison with a computer in your cell. I am talking to people who are living at prisons which provide computers for each person in their room. It is quite unusual for prisons to provide these, and I am interested to hear about your experience of living at a prison	Purpose: ● To understand where the participant has spent

where there are computers in cells. It is quite unusual for prisons to provide these, and I am interested to hear about your experience of living at a prison where there are computers in cells. First of all, I have some questions to find out a little about where you have spent your sentence so far: ● How long have you lived at HMP (current prison)? ● Were you at a prison before HMP (current prison)? {If so, how long have you been in prison on your current sentence and how many prisons have you stayed at?} ● I'm interested to hear your thoughts on HMP (current) - can you talk me through your typical day here? (are you working, in education, do you receive visits from friends and family?) ● How would you describe HMP (current) in comparison with other prisons that you have lived at? Has having a computer been a difference that you have noticed? ● Thinking about the cell that you are living in today, do you share the cell, or do you live there alone? ● Do you have a computer in your cell? {Is this the first prison that you have lived at where you have a computer in your cell? Have you had a computer in your cell for the whole time that you have lived at HMP (Current)? If cell is shared, do you have a computer each?}	their sentence / how long they have had a computer in their cell. ● Easier to answer questions to begin the conversation and open conversation.

Thank you. Next, I would like to hear about how you use the computer in your cell: ● When was the last time that you used the computer in your cell? {What was the purpose / what did you use the computer for?} How does this compare with your typical use? Have you ever used if for other purposes? ● If you think about the last week, how many days, in the last week, would you say you used the computer in your cell? ● On the days that you used the computer, which time of day would you tend to use the computer? (follow up questions - how long would you estimate that you spend on your computer in a typical day? How many different sessions would this typically be?) ● Compared to when you first arrived at HMP (Current) do you use the computer more less or about the same now? Follow up - roughly how much more or less? ● When you think about what you use the computer for, what would you say are the most useful things that you can do on the computer? {Has this changed at all over time, or have you always used the computer in	Purpose: ● To understand the frequency of use and function that the computer is used for.

the same way?} Are there things that you could use the computer for that you do not? (Why? What could make this more likely?) ● What is the longest period of time that you have not used the computer for? {what was happening on these days? Was there a reason why you did not use the computer on these occasions?} ● Where do you sit when you are using the computer? {Would it make a difference to how much you used the computer if you could sit in different places?}	
Thank you. The discussion so far has helped me to hear from you about your time in prison so far, how often you use the computer in your cell and what you tend to use it for. I'm also very interested to hear more from you about what it is like to live in a cell which has a computer. There may be some things that you have found to be positive and also some things that you have found to be less positive. There are no right or wrong answers, people will have different views on these topics. Questions about autonomy, procedural justice, level of care, invested ness:	Purpose: ● To explore feelings (autonomy, level of care, procedural justice) associated with having a computer in cell (what does the presence of a computer represent in

• Can you remember when you first arrived at HMP (Current). Tell me about how you found out that your cell would have a computer in it. {How did that feel? Was it a surprise? Were you interested, happy, neutral, worried about having a computer in your cell?} Why? • Some of the tasks that you can do on your computer, such as ordering your meals and checking how much money you have, are done in other prisons by filling in a form or asking an officer to help you. Would you say there are any differences for people living in prison from using a computer to do these tasks compared with the non-computer way? How do you feel about using the computer for these tasks? • If you heard that a prison provided computers in the cells, and a prison that did not provide computers in the cells, what thoughts might you have about what life might be like at those two prisons? Why? Are people in prisons who have computers advantaged or disadvantaged over people who do not have computers? In what ways? Can you tell me about this? What do you think about the fairness of some prisons having computers and others not? • If you were in charge of running a prison, would you include computers in the cells for prisoners to use? {Why, tell me more about what this would mean for prisoners. Based on your experiences, how would it help prisoners?}	terms of how the prison treats those living there?) • To explore connectedness (relatedness) linked to having a computer in cell – with others living in the prison and with others outside prison. • To explore worries or frustrations related to in cell computers. • To explore if computers are used to lead to behaviour change.

● Can you imagine a situation in which, from tomorrow, the Governor decided to take all the computers out of the cells at HMP (current). What do you think that would be like? {How would you feel? What would you miss? How do you suppose other people living at this prison would feel / how would they react? What effect would this have on the staff, what do you think the officers on your wing would say about the decision?} ● Your computer allows you to carry out tasks that at other prisons you might have to ask someone else for help to do. Does having a computer lead to you feeling that you have more control of how you run your life in here than if you didn't have a computer? Can you tell me more about that? (are you more or less reliant on other people? Do you feel more responsibility for completing tasks now that you have the computer?). Is there any information that you still need to ask an officer for help with to find? Questions about connectedness, relatedness: ● Thinking about your life outside prison, how often do you use a computer or a smartphone? (What were your thoughts about living without the internet when you came to prison? Does the computer in your cell make any difference to how you feel about not having access to the internet or a smartphone?}	

● Some of the content on the computers gives you information about what is happening at HMP (current) - such as messages from the Governor, courses that you can apply for, information about changes to the regime. How do you find receiving information in this way? {Do you think hearing a video message is different to receiving the information via a paper letter? How?} Can you tell me about any video messages that you have listened to? (what did you think of the person presenting it? / did you feel that you understood the topic better?) ● Some of the content on the computers gives you information about what is happening in the community – such as news channels, how to find accommodation or work on release, how to claim benefits etc. Have you looked at this type of information? {What difference does it make to people living in prison to be able to see this on their computers?} ● Do you talk about what you have looked at on your computer with other people living in prison or with members of staff? {Tell me about these conversations}. How do you think the introduction of computers has changed HMP (current) - has it had any effect on the atmosphere or the feeling about safety? ● Some people might say that computers reduce the need for conversations between staff and prisoners. Do you think this is true? {Is this a good or a bad thing? Do you think computers in cells have an impact on	

relationships between staff and prisoners? Or between prisoners? In what way?} How do you think computers have influenced your relationships with staff or with other prisoners? ● I understand that you can book visits for friends and family on your computer. What are the advantages and disadvantages of booking visits in this way? How do you feel about being responsible for booking your visits? Questions about usability, engagement: ● Did you have any worries about using the computer in your cell? {Tell me about this. How did you manage these worries or concerns? Did you ask for help?} ● Have you used the computer to find out information that you did not know? {What type of information have you looked for on the computer? Would you have found this information if you did not have a computer in your cell, how?} How has being able to access this information helped? How has that made you feel? ● Did you know that you can comment on articles or features that are on your computer? {Have you done this? What did you / would you say?} Can you tell me what kinds of things you have said? Can this be done anonymously? Would it be better if it could? Why? Have you enjoyed being able to do this, why?	

● Imagine that you were in charge of deciding what to include on in-cell computers. What would you include on the computers? And why? Also, do you think there are any risks? Do you think there are any opportunities for in cell computers to improve quality of life or well-being for prisoners (and staff)? Questions about change, help-seeking: ● Most people living in prison want to stay out of prison once they are released. Some of the information on the computers is designed to help people to stay out of prisons, for example, by finding support for drug or alcohol use, by managing their feelings, by avoiding violence. Have you looked at any of this yourself? {What do you think about providing this information on computers? Also, can you imagine that being helpful, how? Can you imagine it helping now and helping with staying out of prison in future, how? Do you think people are more or less likely to look at this information compared to asking their offender manager or key worker for help?} ● Has anything that you have read about on the computer led to you taking a step to seek further help or to take action to better your future?	

● Are there topics that you think people would prefer to find information about on a computer without having to speak to someone else for help? {How might this be helpful? Would you have any concerns about people using the computer to ask for information?} ● I'm interested to hear about whether computers in cells allow people to feel in control of finding information that they need. What are your thoughts about this? ● Have you heard anyone talk about using the computers to find information that might help them to stay out of prison or to find help for something that has been a problem for them in the past? {Can you tell me about this?}	
Mopping up: Return to topics about which I have outstanding questions. Thank you for talking to me about your experience of living in a cell with a computer. Is there anything else that we have not talked about today that you think is important for me to know about this topic?	Purpose: ● Opportunity for participant to include information that has not been discussed (which may then add to

	questions for future participants). ● Opportunity for interviewer to return to any of previous topics that there are remaining questions about.

Appendix H

Individual Learning Plan