

Technology as a means of rehabilitation: A measurable impact on reducing crime

Cynthia McDougall

University of York

Dominic A.S. Pearson

University of Portsmouth

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Correspondence concerning this chapter should be addressed to
Cynthia McDougall, Department of Psychology, University of York,
York, YO10 5DD, United Kingdom.

Contact: cynthia.mcdougall@york.ac.uk

Abstract

Although prisons aim to rehabilitate offenders and offer programs to change offending behavior, they rarely provide a culture that sustains such a change. This chapter describes how digital technology can impact on the dependency culture that exists in prisons. Prisoners have little opportunity for taking personal responsibility within a prison regime, so prison does not prepare them for managing their lives after release. Technology offers the opportunity to normalize the prison environment more closely with that of the outside world making the processes more efficient and encouraging self-responsibility and self-improvement in prisoners. This chapter describes the introduction of self-service kiosks, similar to those found in the community in supermarkets, travel centers, doctors' surgeries and job centers. The kiosks, accessed via biometric fingerprint identification, are located on wing landings, and enable prisoners to complete tasks previously carried out by prison officers using resource intensive paper-based systems. The functions on the kiosks include: access to prisoner account balance, canteen shopping, menu ordering, visits booking, and applications for education. Processes of implementation are described, including staff and prisoner responses, and frequency of use. Rigorous evaluation of the impact on performance measures of introducing the kiosks in a number of mainly private prisons in our recent research revealed a statistically significant reduction in adjudications for in-prison misbehavior including violence. Reoffending was also significantly lower than in prisons without self-service technology. Potential for using the kiosks to develop the educational and rehabilitative functions of prisons are discussed.

Keywords: digital technology, prisoner rehabilitation, process evaluation, digital prisons, adjudications, recidivism, stepped wedge design.

Much of this book is about cybercrime and cyberdeviance, and how offenders exploit the vulnerability of victims, whether they be governments, commercial organizations or individuals. For some offenders, technology is seen as a new and inviting tool to assist in the commission of even more skilful and lucrative types of crime. Many of these offenders will become part of the prison population and have no desire or intention to change or lead law abiding lives in the future. This is often evident from their exploitative and deviant behavior in prison (McDougall, Pearson, Willoughby, & Bowles, 2013).

There are however prisoners who do want to change but do not always have the ability to do so. The criminogenic needs which continually lead them back into offending (Bonta & Andrews, 2017) are often hard to overcome. These include alcohol and drug misuse, mental health problems, poor problem solving, limited education, inability to read, and learning difficulties, many of which lead to dysfunctional and broken relationships and self-harm. This chapter examines how technology can be beneficial to those offenders who are seeking the opportunity to mend their lives, but cannot achieve this without external support. We present evidence in this chapter of how technology can be used to assist change with these prisoners and to rehabilitate them.

It is reasonable to say that, when technology has been introduced into prisons, the principal purpose has usually been to make the prisons more efficient and to reduce costs. This statement is supported in the UK by the fact that private prisons have been among the first to introduce technology into their establishments (McDougall, Pearson, Torgerson & Garcia-Reyes, 2017). In the United States (State of California) efficiencies have been achieved by reducing the state prison population and managing offenders in their local communities (Petersilia, 2016). These efficiencies allow scope for new approaches to rehabilitation.

In a ground-breaking speech, shortly after taking up post, the UK Justice Secretary, announced his approach to running prisons (Gauke, 2018 a). This was based on ‘getting the basics right’ in order to create ‘environments that are decent, clean and safe’ and in which rehabilitation can flourish. He announced that there would be an expansion of in-cell telephones, currently operating under strict security in a small number of prisons. This would allow family telephone calls to take place quickly and privately (Gauke, July, 2018 c). He also proposed to install digital self-service kiosks ‘to speed up arranging visits and managing money’ (Gauke, 2018 c). Wing- based kiosk facilities, with biometric fingerprint identification, have been in existence in some privately-run prisons in the UK for some time, with expansion of the available functions, as required. The kiosks allow prisoners to complete tasks previously carried out using resource intensive paper-based application systems that occupy most of a prison officer’s time. The range of functions on the kiosks include: prisoner self-checking of spending account balance; canteen shopping (from the prison shop); phone card top up; meal ordering; access to the prisoner’s daily timetable; family visits booking; noticeboard messages; applications for health care appointments, clothing items, employment change; requests to attend education classes or offending behavior programs; and a Frequently Asked Questions service. All of these tasks were previously carried out manually by prison officers receiving requests and delivering the paper-based applications to the relevant departments. Support staff and specialist personnel then dealt with these applications or queries, and returned them to the wing for distribution by hand to the prisoners. This chapter describes an evaluation of prisoner self-service kiosks and their impact on rehabilitation.

How prisons can be improved with the introduction of technology.

A Chief Inspector of Prisons in England and Wales, is quoted as saying that prisons are in a 'pre-internet dark age' (Champion & Edgar, 2013, p. iii) and this may be true of most prisons internationally (Molleman & van Os, 2016). This view is confirmed by Reisdorf and Rikard (2018), based on a critique of current prison policies in the United States (US). According to Reisdorf and Rikard, no US prisons allow full access to the internet in their establishments, with approximately 10 states offering only limited access. They claim that many US prisoners have never used digital technologies, or have been forced to discontinue use when incarcerated. Although it is acknowledged that digital skills are required in most occupations, many prisoners in the US have never been taught how to use digital technologies. Reisdorf and Rikard (2018) argue for a revision of rehabilitation theory to incorporate digital inequality research.

Criminologists and psychologists have for some time drawn attention to the disadvantage to prisoners internationally, created by lack of digital facilities in prisons and hence limited acquisition of skills (Jewkes & Reisdorf, 2016; Knight, 2015). There has however so far been little published empirical evidence on the beneficial effect these skills may have on rehabilitation. Wolff, Shi, and Schumann (2012), in a study of how well prisoners were prepared for release, emphasized the importance of prisoners being supported in re-joining their communities, particularly those who had been serving long prison sentences. They proposed that the kinds of support prisoners needed were in education, financial assistance, job training, employment assistance, and community living skills, together with the self-management skills associated with their offense-related problems. Wolff et al. did not however include the acquisition of digital technology skills in their list. Indeed few studies so far have presented evidence of the importance of digital technology in everyday life and the growing relationship between digital and social exclusion (Helsper &

Eynon, 2013). In particular research has not so far recognized that many of the skills Wolf et al. (2012) identified as important to rehabilitation are now dependent on digital capabilities.

Dame Sally Coates (2016) in her report reviewing education in UK prisons strongly supported the teaching of digital skills to prisoners as a necessity in increasing job and educational prospects, and reducing the likelihood that prisoners will reoffend. Given that ‘nearly one-third of prisoners have self-identified on initial assessment as having a learning difficulty and/or disability, these prisoners will be doubly disadvantaged by being deprived of learning basic digital skills while in prison’ (Coates, 2016, p iii). To the current authors’ knowledge the value of teaching digital technology skills to prisoners and the potential impact on criminal behavior, as presented in this chapter, and in McDougall et al. (2017), has not previously been evaluated.

In current society we are totally dependent on our mobile cell-phones and the self-service kiosks that allow us to withdraw cash, pay for our purchases, and buy our travel tickets. This is the simplest and quickest way, and we get an immediate response to our requests. As Elias Aboujaoude observed: ‘We do everything online today and do it so seamlessly that it is easy to forget how relatively young the medium still is’ (Aboujaoude, 2011, p. 15).

Despite this progress in society, little change has occurred in prisons. Today, in most of our prisons, if prisoners have a request they have to either speak to a prison officer or write the request on a piece of paper. This piece of paper is then transferred to the relevant department, is dealt with by hand, and returned to the prisoner with an answer. This transaction could take days, and depends on the quantity of paperwork the officer is required to handle that day from a wing full of prisoners. Often prisoners equate the speed of response with the degree to which they are treated with respect (Hulley, Liebling, & Crewe, 2012), and are known to accuse prison officers of deliberately losing applications from prisoners they do

not like. This can become a major source of tension between officers and prisoners. In the case of ordering toiletries and food items from the prison shop, this could amount to more than one thousand pieces of paper being handled by officers during one week on this one function. The cost of each list of purchases is calculated by hand in the prison shop and manually taken from the prisoner's spending account. This process is inevitably subject to delay and human error, which again results in frequent frustrations between prisoners and staff, and is far removed from preparing the prisoners to take on responsibility for their lives on release. This is indeed 'a pre-internet dark-age' (Champion & Edgar, 2013, p. iii).

In the community, some of the most basic tasks will require released prisoners to use a self-service kiosk. For example, they would have to apply for a job using a kiosk at the employment office, their probation officer will keep in touch by text or by mobile cell-phone, and if they want to see a doctor, they would use a kiosk to register for the appointment. All of these skills now need to be taught in prison as part of basic living skills. Digital technology skills are no longer a luxury.

McDougall et al. (2017), in their evaluation of the impact of self-service kiosks on prisoners' behavior in prison and afterwards in the community developed a Theory of Change to explain how, in addition to improving efficiency, use of the kiosks might impact on rehabilitation.



Figure 1. Theory of change for prisoners, based on the model presented in the Journal of Experimental Criminology, McDougall, Pearson, Torgerson & Garcia-Reyes (2017).

Figure 1 shows how we would anticipate that the introduction of self-service kiosks might contribute to prisoner rehabilitation. Firstly it gives the prisoner an element of control over the basic necessities of prison life. This in itself addresses one of the main concerns in Agnew's (2006) general strain theory (GST), which suggests that events and conditions that are physically or psychologically distressing increase the likelihood of criminal behavior. In a prisons context, the stressors are often the perceived lack of fairness and lack of control commonly observed (Listwan, Sullivan, Agnew, Cullen & Colvin, 2013). If these stressors can be alleviated this should contribute to a reduction in the anger and frustration which often leads to violent behavior.

At the start prisoners can take control of their own rehabilitation, making direct contact with an offender supervisor, initiate appointments to discuss release plans or family issues, offense-related programs and employment training, and seek assistance with finding future accommodation on release. Mann, Webster, Wakeling and Keylock (2013) have noted that many offenders are deterred from seeking help with rehabilitation when they have to

make the request for help through a prison officer. This ability to make direct contact with change agents in seeking help removes this obstacle.

Additionally, having access to education allows prisoners to address poor literacy skills, one of the frequent criminogenic needs identified by Bonta and Andrews (2017), and provides the pathway to rehabilitation exhorted in the Coates (2016) review of prison education.

The regular use of self-service kiosks will give prisoners more confidence in their ability to conduct basic tasks using technology. They will thus develop self-responsibility, and reduce dependence on prison officers. This is one of the model's pathways to reducing disciplinary adjudications.

Easier contact with family and friends will be facilitated by organizing and timetabling prison visits. Lösel, Pugh, Markson, Souza and Lansky (2012) emphasized the importance of family contact in a longitudinal study of imprisoned fathers and their families. Positive resettlement, which included desistance from crime, was associated with high quality family relationships, good communication and high frequency of family contact while in prison.

The improved opportunities presented through prisoner self-service are likely to benefit mental health, boosting self-confidence, reducing prison officer/prisoner tensions, and improving family relationships. These may lead to a more positive attitude to making purposeful release plans, and reinforce motivation to desist from future offending.

These benefits may ultimately lead to an improvement in behavior in the prison, and hence fewer adjudications, which is a positive predictor of reduced re-offending (Cochran, Mears, Bales & Stewart, 2014; French & Gendreau, 2006; Heil, Harrison, English & Ahlmeyer, 2009). At the same time there is likely to be a positive impact on rehabilitation, through improved family relationships (Lösel et al. 2012) and an increase in successful

completions of offending behavior programs (Bonta & Andrews, 2017). Additionally, prison officers will be relieved of time-consuming paper-based tasks, so allowing time to be spent with prisoners on personal officer activities such as encouraging and supporting prisoners' problem-solving and coping skills (Champion & Edgar, 2013; McDougall & Pearson, 2014).

The Theory of Change was later partially tested in a quantitative evaluation of change in performance measures (McDougall et al., 2017).

Inside a prison introducing digital technology

The following is a previously unpublished description of: the process of changing the culture of a prison by introducing wing-based prisoner self-service kiosks; the reaction from staff and prisoners; and the impact on the efficiency of the prison processes (McDougall and Pearson, 2014).

Based on documentation supplied by the kiosk provider and the views of senior managers, the prime purpose of installation of self-service technology was to achieve a number of business benefits. These included both hard benefits, such as savings in staff time, reductions in food waste and usage of paper and printing required in the laborious paper-based processes, and soft benefits, such as increased prisoner responsibility, improved prisoner life skills, reduced frustration of prisoners, reduced stress on staff and fewer assaults. Prisoner rehabilitation was also a hypothesized benefit, due to prisoners gaining experience of organizing and managing their own affairs, increased self-reliance and greater independence, and more involvement in purposeful activities.

Process evaluation research methodology

A process evaluation was conducted in one prison, selected because it was planned to receive self-service kiosks imminently (McDougall & Pearson, 2014; Unpublished Process

Evaluation Report). The prison was privately operated, housing over 1,000 prisoners, categorized as a Category C Trainer, holding adult male prisoners serving between 12 months and 4 years. The prison was relatively new.

We visited the prison before, during and after installation of kiosks to conduct a review of process and implementation (McDougall & Pearson, 2014). The review adopted a comprehensive evaluation methodology (Bouffard, Taxman, & Silverman, 2003) combining quantitative and qualitative techniques which provided confirmatory cross-methodological evidence. These approaches incorporated: views of managers, operational staff, and prisoners, including views on types of training; monitoring of frequency of usage of kiosks and types of use; and observation of usage via Closed Circuit TV (CCTV) footage. In addition we collected some case examples to illustrate individual user characteristics.

Implementation procedure

Management and staff were consulted by the technology provider about necessary changes to processes and the impact of kiosks on back-office functions. Sensibly, adjustments were made to plans to fit in with the operation of the prison, including delaying the visits booking function to await building completion of a new visits complex.

The main premise behind the approach to staff training was that the prison must continue to operate while staff were being trained. Training of staff was therefore cascaded to cause as little disruption as possible. Awareness sessions were delivered, and approximately 30% - 40% of key staff in each function received direct training from the provider. Next training was cascaded from trained staff, and then supported by written materials. Training Guides and Quick Training Guides were provided. It was recognized that introduction of digital technology presented a 'root and branch' change for many back office functions, so

the training could be challenging in some functions, particularly where finance was involved, leading to some apprehension. Two managers, one with self-service kiosk experience across a range of prisons, and another locally-based digital technology manager, were therefore designated to support the establishment and its staff in coping with installation and use of the systems. These were designated as ‘trouble-shooters’ who were available to help with any aspect of the project, including support of training.

Training of prisoners was conducted by staff with the aid of written instructions. Trusted prisoners were identified on each wing to help those prisoners who were having difficulty in using the technology. Since the kiosks were in open sight, officers were encouraged to look out for any instances of abuse. A system of prisoner ‘listeners’ (linked to The Samaritans¹) and designated mentors already existed on each wing. Some mentors had experience of self-service kiosks in previous prisons, while others were trained by staff to use the kiosks so that they could support other prisoners in system usage. A ‘buddy’ system was also in place for supporting older prisoners. All prisoners with reading difficulties were already identified on reception and encouraged to take part in a Reading Support Scheme run by a Charitable Agency (the Shannon Trust) aimed at helping those with reading difficulties in prison. These helpers were tasked with seeking out prisoners with literacy needs to help them with kiosk use. Staff members were also encouraged to assist any prisoners having difficulty with kiosk use. Following installation of the self-service system, prisoner training on kiosks was planned to be added to their Induction Program.

Impact on people

Staff and prisoner opinions

¹ A UK voluntary organisation in the community that offers support to those at risk of self-harm.

We held focus groups with staff and prisoners one month before the self-service system was installed, and one month after. The staff groups were divided between those officers who worked on the prison wings, and those who had specialist jobs, e.g. working on reception of prisoners, or supervising visits. The prisoner groups were divided between those prisoners on a main wing, and prisoners from a more vulnerable group who were anticipated to have difficulty managing the self-service systems.

In the pre-installation focus groups, we consulted staff and prisoners on their general opinions of prisoner self-service. Staff anticipated the self-service kiosks would: cut down on paperwork giving them more time to spend on personal officer tasks; reduce frustrations between prisoners and staff caused by the lengthy application processes; and would encourage prisoner involvement in purposeful activities. Prisoners thought that with self-service: it would be easier to manage their finances; they looked forward to meal selection; and the kiosks would reduce tensions and frustrations over visits booking, finance and canteen shopping. Some concerns were expressed that some prisoners might have difficulty in learning to use the kiosks.

Consultation one month after implementation raised some issues of concern, but both staff and prisoners referred to these as ‘teething troubles’ and both groups thought that things would get better. Full benefits had not yet been felt by staff as some dual systems were still in operation, i.e., the old system was running in parallel until the new system had been thoroughly tested. Staff, however, could recognize that prisoners were taking on more responsibility. Instead of presenting a problem to staff such as ‘why is my pay wrong?’, prisoners could now work out why their pay was wrong and ask for a correction.

Staff also experienced time savings. The introduction of the spending Account Balance enquiry function had led to many fewer queries from prisoners. Prisoner reception was running smoothly. The canteen shop had already seen large savings in time: canteen

staff now did not have to cost every purchase individually and deal with paper-based applications from over 1,000 prisoners per week. They remarked that purchases of fresh fruit had unexpectedly almost doubled since the introduction of kiosks, with pictures now presented alongside titles of products to assist in identification. Purchases of newspapers were now requested and paid for in advance by prisoners, saving the canteen 12 hours per week on this one task. Prisoners in focus groups and in individual discussions, having received help with kiosks from staff and mentors, concluded that kiosks were easy to use.

Prisoners' concerns included breakdowns of kiosks, which happened a lot initially but had improved by the time of our visit. Prisoners accepted that kiosks were repaired when they reported breakdowns to the officers. Machines were also regularly running out of paper for receipts, which was addressed on one wing by prisoners taking responsibility themselves for ordering more. Use of kiosks led to some discussion of policy issues not related directly to prisoner self-service, but which had been highlighted by the ability to check account balances frequently. Some prisoners thought the canteen shopping system was excellent. An unexpected side-effect was prisoners ordering more from the canteen causing less availability of their favorite choices.

Kiosks, however, had given confidence to those afraid to use computerized systems and the kiosks were thought to be user-friendly. These systems had made prisoners take control of their finances, and they felt they were gaining life skills.

Kiosk usage measures

Printed snapshots of actual kiosk usage were taken on two wings at two time points : immediately after implementation of self-service kiosks, and one month later. Use of kiosks increased over the two time points on both wings, with one main wing showing a statistically significant increase in use of account balance enquiry, canteen shopping, phone top up, Frequently Asked Questions and individual timetables.

Observation of usage

CCTV footage was observed on two wings at the two time points at which kiosk usage was measured. Use of the kiosks was slow at the first time-point with long periods without activity, but at the second time-point snapshots showed a ‘hive’ of activity at the kiosks. Usage was orderly and there were no signs of frustration or intrusion.

Prisoner survey

A survey was conducted one month after the installation to gauge the prisoner attitudes to the self-service system. This was included in McDougall et al. (2017). Out of a possible 1,389 prisoners, 743 (53%) responded to the questionnaire. Although only one-half of the population responded, this is more than double what can be expected, and was considered to be an exceptionally good response rate in a prisoner survey (Gojkovic, Meek & Mills (2011).² Below we divide the prisoner survey questions and responses by two relevant prison performance monitoring priorities (‘Safe, Decent and Secure Prisons’, and ‘Prisoner Rehabilitation’).

Prisoner survey results: Safe, decent and secure prisons.

Of the 743 respondents, 93% thought the kiosks were “Easy” or “Very Easy” to use, even though very little formal training was offered; while 7% thought the kiosks were “Difficult” or “Very Difficult” to use. When asked ‘Did you get enough training/help to use the kiosks’: 10% thought the training/help was about right; 80% of respondents said they had had no training/help or not much training/help; and 10% said they had “quite a bit” or “very much” training/help to use the kiosks.

Many of the staff, including the Director of the Prison where the survey was conducted, thought that the kiosks would give the prisoners more responsibility and control

² An example of a typical prison survey response rate was 4% to 25% across eight prisons, e.g., published in Third Sector Research Centre (TSRC) Working Paper 61, 2011), a report on “Offender engagement with third sector organisations: a national prison-based survey”.

over their lives in prison. When prisoners were asked the question, “Have the kiosks given you more control over your life in prison?”, 55% thought that the kiosks had given them “more” or “much more” control. This was the highest affirmatory response in the survey which suggests that the technology was having this impact. Meanwhile, 36% thought the kiosks had made no difference; and 8% thought kiosks had given them “less” or “much less” control over their lives.

When prisoners were asked if the self-service system had affected their relationships with prison officers: 32% thought relationships were “better” or “much better” after installation; 58% thought self-service had made no difference to relationships with officers; and 10% thought relationships were “worse” or “much worse”.

Prisoner survey results: Prisoner rehabilitation.

Following introduction of the kiosks, 37% thought that relationships with family and friends were “better” or “much better”; 53% thought that the kiosks had made no difference to relationships with family and friends; and 10% thought relationships were “worse” or “much worse”.

When asked if using the kiosks would give them more confidence to deal with technology-enabled services in the outside world, 43% said that using the kiosks had given them “more” or “much more” confidence; 50% said they had made no difference to their confidence; and 7% said that kiosks had made them “less” or “much less” confident.

While the survey suggests that prisoners in general had a positive reaction to the self-service kiosks, there was, however, a small percentage who would like to go back to the old ways of doing things. This group either needs support to make better use of the kiosks or to be allowed to seek the assistance from prison officers if that is needed. Attention should be given to the genuine physical difficulties that this small percentage of the users seemed to

have with biometric identification and poor eye-sight. Ten percent thought relationships with officers were 'worse' or 'much worse,' which suggests that this group valued the individual support given by officers during the paper-based interactions. Weakened prisoner/staff relationships have from time to time been proposed as a potential negative outcome from introduction of kiosks; however, this survey appeared to show that the prisoners who hold this view are in the minority. Nevertheless, the support from officers that this group of prisoners requires should be noted.

In general, we found prisoner self-service was perceived to be advantageous at a prison level by staff and by prisoners. We therefore thought it important to investigate whether the favorable impression made on individual staff and prisoners had also had a positive impact on in-prison behavior. The following study examined this hypothesis.

Impact of digital technology on prison performance measures

A multi-prison study was conducted to test the impact on a range of prisons that had already introduced the prisoner self-service system (McDougall et al., 2017), and this research is summarized here.

The prisons were mainly privately operated adult male prisons with prisoner populations ranging from 1,000 to 2,000 prisoners. UK prisons are categorized from A (high security) to D (open/lowest security). The prisons in this research sample were Category B and C Trainer prisons (hence medium security categories), and Local prisons (housing shorter sentence and prisoners on remand). The prisons were in located in England, Wales and Scotland.

The research design was retrospective as kiosks had already been installed in some prisons over a number of years. Since there are cultural and organizational differences

between public and private sector prisons it was not appropriate to use public prisons as a control group. The research therefore employed a ‘natural stepped wedge’ design (Hussey & Hughes, 2007), which is one of the most rigorous evaluation methods that can be applied, without introducing a randomized controlled trial. Most of the 13 prisons included in the study had introduced self-service kiosks at different times across a seven year period from 2007 to 2014, allowing the researchers to examine the level of monthly performance measures at each stage in each prison which had installed self-service, in comparison with the prisons that had not yet installed self-service. In Figure 2 one can see that in 2007 no prison had yet installed self-service technology, but in 2008 three prisons had installed the technology. This created an ‘intervention group’ of three prisons and a control group of ten (at this time point). As time went on, more prisons installed self-service, thus increasing the size of the intervention group and reducing the control group. If the ‘intervention’ was indeed having an effect, we would expect to see changes within each prison relating to the time when the kiosks were installed, and not at the other prisons. We therefore had a group comparison between intervention and control prisons at each stage. We were simultaneously able to examine each individual prison’s pre- and post- installation performance data, giving us a within prison comparison. Hence, this minimized the possibility that the outcome was due to any change other than the installation of the self-service technology.

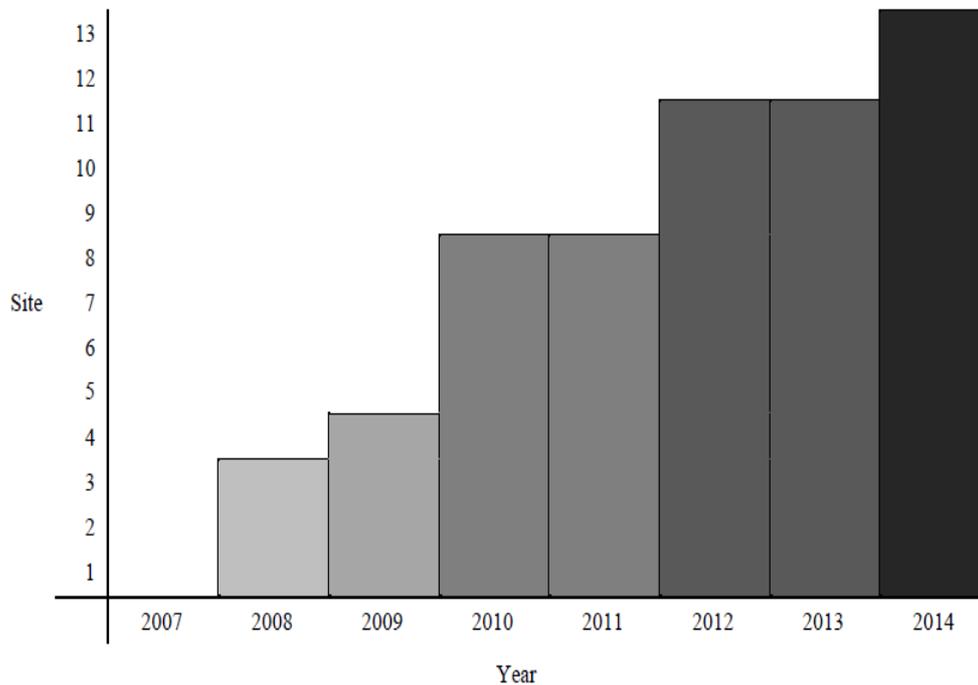


Figure 2. A natural stepped wedge design showing introduction of self-service technology over a period of seven years, with the vertical axis showing prison sites and the horizontal axis showing the time periods (taken from McDougall et al., 2017).

The proposed main statistical analysis of the study was longitudinal multi-level modelling (Singer & Willett, 2003). This method allows assessment of the immediate impact on, and change over time in, selected outcome measures associated with implementation of an intervention. We were therefore able to estimate the impact of self-service kiosks both within and between prisons. On occasion this method of analysis was not suitable due to sample size, when *t*-tests were used.

Outcome measures

Outcome measures were identified to examine the impact on three key national prison performance monitoring priorities. Although the Theory of Change for prisoners (Figure 1) identified a number of variables that might impact on prison behavior, from a statistical point of view, we chose to select a primary measure for each main prison priority.

Table 1

Correspondence between Performance Outcome Measures and Prison Priority Areas

<i>Priority Area</i>	<i>Performance Measure</i>
Safe, Decent and Secure Prisons	Adjudications
Prisoner Rehabilitation	Offending Behavior Program Completions
Reoffending after Release	Number of Proved Reconvictions

The data were drawn from performance measures already collected by HM Prison Service. Adjudications and Offending Behavior Program completions were the internal performance measures, and these were followed by a post-release analysis of reoffending.

Adjudications

It was anticipated in the Theory of Change that tensions between prisoners and staff, due to reliance on time-consuming paper-based application systems, would be reduced following the introduction of self-service kiosks. Adjudications are the main disciplinary procedures used in prisons by Governors/Directors to hear cases of breaches of prison rules and to impose sanctions. This 'adjudications' outcome measure recorded monthly frequencies of misconducts with findings of guilt, regardless of severity, including violent offences, calculated as a proportion of the current prisoner population.

Offending behavior programme (OBP) completions

OBP Completions were selected as a measure of rehabilitation. These were restricted to accredited Living Skills or Thinking Skills Programs as these tend to be run in most UK prisons and are not offense-specific. OBP Completions were measured as a proportion of

OBP Starts as a means of measuring prisoner willingness to change. This measure was selected as a proxy for commitment to rehabilitation. OBP completions are recognized in research as an interim indicator of reduction in reoffending (Lipsey, Landenberger & Wilson, 2007).

Results of the impact evaluation

Adjudications

There was a statistically significant reduction in the level of adjudications following installation of self-service kiosks.³ The statistical model took account of the different time points across 13 prisons when kiosks were introduced in each prison compared with the prisons not installing kiosks at those times. We can therefore be confident that this change in adjudications was associated with installation of the kiosks.

The reduction in adjudications gradually returned to pre-installation levels over a period of three years. As some prisons had a smaller amount of either pre- or post-kiosk data, we conducted a sensitivity analysis on adjudications in five prisons which had the longest time periods of pre- and post-data. The analysis in this sub-sample appeared to confirm that the significant reduction was not limited to (or over-represented by) those prisons with fewer pre- and post- installation adjudications time points.

As there are numerous factors that contribute to tensions in the prisons estate, it is not surprising that other events begin to impact on adjudications in the longer term. Research into duration of treatment effects over time has shown that the provision of after-care may help maintenance of initial change following treatment (Prendergast, Hall, Wexler, Melnick, & Cao, 2004), and that a deterioration of impact in the short-term does not necessarily mean that the benefits will not be experienced over a longer term period (Joliffe, Farrington &

³ Mean difference = -.49 (95% CI: -.75, -.24), $t = -3.79$, $p < .001$.

Howard, 2013). It was nevertheless impressive that the elimination of a paper-based application system was associated with a statistically significant reduction in adjudications over a three year time period. Although beyond the scope of McDougall et al.'s (2017) study, a comparison with changes in overall levels of adjudications in the wider prison estate over the time period would be informative.

Offending behavior program completions

A large amount of program completion information was made available by the central performance hub of Her Majesty's Prison and Probation Service (HMPPS) from April 2010. However, information on programme 'starts' was only available from April 2009, which limited the analysis of the impact of self-service installations that occurred up to 2009. It was therefore not possible to apply the full multi-level model analysis. Therefore, a simple parametric analysis was applied to investigate trends in the data. The mean proportion of completers to starters pre-self-service kiosks was 88.25% ($SD=4.55$) while post-self-service the mean was 93.67% ($SD=4.57$). The difference in means was not statistically significant.⁴ This is likely to be due to the small sample size; however, the average completion rate of 93.67% was nearing the ceiling of possible performance which is a very satisfactory level.

Although our confidence in the results is limited due to sample size, Figure 3 shows that three out of five of the prisons with complete data showed a sizeable increase in completions after self-service installation, which is encouraging and positive. A larger sample would have allowed for a full analysis which would have accounted for impact of self-service, the different types of prison, and the system-wide changes over time affecting prisons with and without self-service kiosks.

⁴ ($t = -1.96, df=4, p=.121$).

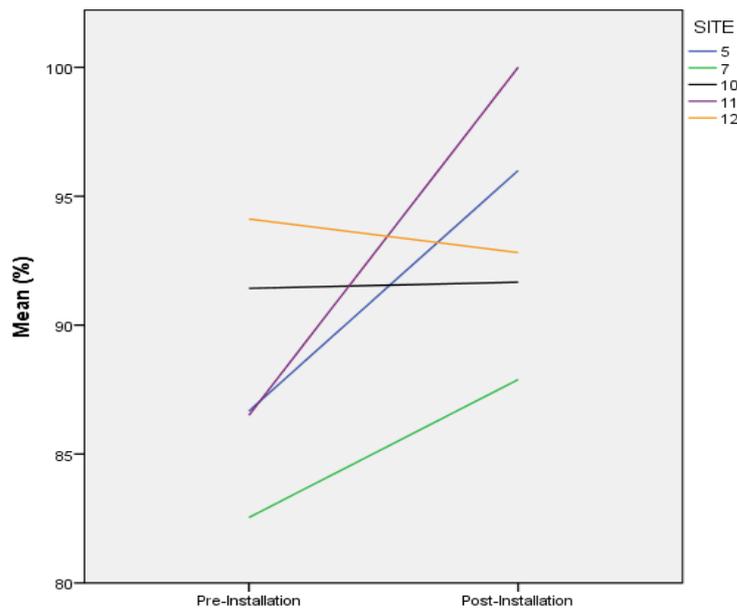


Figure 3. Proportion of completers relative to starters before and after self-service installation (taken from McDougall et al., 2017).

The Theory of Change proposed that improvement in prison behavior could be reflected in a reduction in re-offending, particularly since adjudications have consistently been shown in the research literature as predicting reduced recidivism. An analysis of reoffending associated with the installation of the technology was therefore conducted.

Prisoner **reoffending following experience of self-service technology**

A proved re-offense is defined as any offense committed in a one year follow-up period that leads to a court conviction or caution in that one year (or within a further six month waiting period to allow the offense to be proved in court). Proved reoffending data for the self-service kiosk prisons were provided by Justice Statistics Analytical Services, of HM Ministry of Justice.

Prisoners released during a six month pre- and six month post-kiosk phase were followed up for one year and proved reoffending was recorded. Reoffending data were available for seven of the 13 prisons in the original sample. Missing data were due to some

prisons not having sufficient prisoners released during the time period, while other prisons had installed kiosks later in the seven years under study, which did not allow sufficient time for proved reoffending data to be available.

As a comparison group a sample of public sector prisons recognized by the Ministry of Justice as a 'family' group with similar characteristics to the seven prisons in the self-service sample was also examined during the same time periods and followed up for proved reoffending for one year, with an average taken for the prisons in each family group in each reoffending period.

Data in the kiosk sample were all adjusted to take account of the predicted rate of reoffending pre- and post-self-service using the Offender Group Reconviction Scale (OGRS3, Howard, Francis, Soothill, & Humphreys, 2009).⁵ The actual rate was closer to or better than predicted by OGRS in six of the seven sites and the adjusted rate was lower after kiosk installation than before ($z = -2.03$, $p = .04$, $r = -.54$). This reduction in proved reoffending was statistically significant. The effect size (r) shows that this represents a large change in outcomes between the pre- and post- kiosk cohorts.

Comparison with the national trend in reduced proved reoffending

As we were aware that general prison reoffending had been decreasing over the seven year time-period of our study, Justice Statistics Analytical Services provided us with comparison group data from the same family group of prisons to those in our sample so that we could compare the trend in prisons in general against those prisons with self-service kiosks. We measured the self-service prison reoffending data and the control prison

⁵ The Offender Group Reconviction Scale (OGRS) is a Ministry of Justice developed predictor of re-offending based only on static risks – age, gender and criminal history. It allows probation, prison and youth justice staff to produce predictions for individual offenders even when the use of dynamic risk assessment tools (e.g. The Offender Assessment System (OASys) or Asset) is not possible.

reoffending data over the same time periods, adjusted for OGRS scores (see Figure 4). The difference between baseline and post-kiosk reoffending for the comparison prisons was -0.78% and for the self-service prisons it was -5.36% , a difference of 4.78 percentage points.

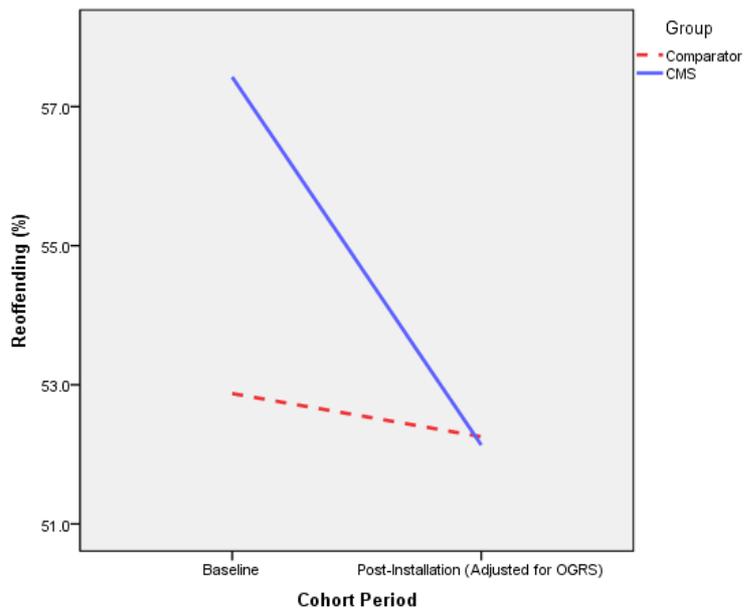


Figure 4. Summary of change in reoffending compared to the national trend, taken from McDougall et al. (2017).

The above results show that the reduction in proved reoffending was almost 5 percentage points greater in the self-service kiosk prisons than in a matched portion of the general prison population, demonstrating that the impact on proved reoffending was greater than the national trend.

Future areas for study

In-cell telephones

At the time of the self-service kiosk evaluation studies, there was a small number of UK prisons with in-cell telephones, offering restricted access to approved telephone numbers.

Because of the small numbers, it was not possible to conduct a quantitative impact assessment on prison performance measures and reoffending. There were, however, opportunities to speak to staff and prisoners in focus groups and to interview a small number of prison visitors to gauge reaction to the availability of in-cell phones.

Staff found undoubted benefits from in-cell telephony. Access to wing telephones was a constant cause of tension due to the heavy demand from prisoners to make calls in the limited amount of time available. There was particular pressure at lock-up time at 5:30 p.m. Most family contacts in the community who were working would not be home from work before then so many prisoners were trying to make calls at around the same time. Meanwhile staff were trying to carry out prisoner lock-up duties. Staff stated this was one of the most difficult times of the day for officers to manage good order on the wings.

When asked, prisoners voiced the opinion that in-cell phones were excellent. These phones allowed them to make calls at times suitable for the family, and be able to speak to their children at bedtime. There were some negative issues raised such as the high cost of calls and limited cash that prisoners were allowed to spend each week. However, in general, reactions were positive.

A small number of prison visitors were interviewed ($n=8$). The visitors were also mainly positive about in-cell phones. They thought that the phones had made a big difference. Prisoners could phone at more convenient times and for longer, with less background noise and more privacy. A sample of comments were: 'It fits better with work schedules and is more relaxed'; 'He has better contact with the children and is more of a father to them'; 'it gives me peace of mind to know he's OK'. One visitor said it made the prison sentence harder for her partner, as he now knows what he is missing. Another said 'We're closer than ever; he opens up more; it has made the last few years seem worth it.

He's now part of the family'. When asked what the impact had been of in-cell phone calls, one visitor said 'Perhaps I am visiting more'.

Although we were unable to measure impact on performance measures, the comments of staff, prisoners and visitors suggest that improvements in behavior may be measurable. All three groups talked of a reduction in tension, which suggests this might impact on the number of adjudications and assaults in the prison. It appeared that both prisoners and family thought that family relationships had improved. Additionally, the facility to telephone 'the Samaritans' at no cost if they were feeling in need of support in times of depression may well have an impact on levels of self-harm.

As with self-service kiosks, there seemed to be agreement between staff and prisoners that the introduction of in-cell telephony was a good thing, helping to strengthen family ties and engendering a motivation to avoid reoffending.

Costs

We have not so far touched on economic costs and benefits of introducing self-service technology, but it should be apparent that technology has the potential to speed up processes within a prison. Technology should therefore reduce the time officers have to spend on time-consuming paper-based tasks, which could easily be undertaken by prisoners themselves. It is not anticipated that there will be savings in actual staff numbers, where minimum staffing levels have been bench-marked, although it is anticipated that more staff time will be available to undertake tasks associated with security, rehabilitation and prisoner/personal officer interaction.

Changes in systems of menu ordering and in eliminating many paper-based systems may result in reductions in food waste, and in paper usage. Due to reductions in tension and assaults across the prison, there may be improvements in staff sick absence. Savings

obtained from officer availability to perform other tasks can be measured, and added to quantifiable costs saved by reduced adjudications. A major saving would be in benefits accrued from reducing reoffending in the community, which can also be calculated, based on guidelines for estimating the economic and social costs of crime in England and Wales (Dubourg & Hamed, 2005).

A thorough cost-benefits analysis is required to balance the anticipated savings against capital costs of purchasing hardware and software, as well as recurrent costs of re-licensing the software. In McDougall et al. (2017) wing kiosks were used, which are the cheapest to operate as they can be used by large numbers of prisoners. Individual devices such as tablets or laptops are more expensive, and there is a need for cabling and/or wireless access. However these devices do have the potential to be used for more educational functions that require extended access to the device, and these could accrue savings in central education provision. In both cases capital outlay is involved, however a rental model is available which does not require a large up-front investment.

The proposed costs-benefits analysis should also ensure that the hypothesized savings are available, and are not offset by additional unanticipated costs from increased prisoner use of more accessible facilities such as the complaints system or of direct contact with offender managers. Given the diversity among prisons in terms of population size, security category, and type of prisoner, the levels of savings in the establishments can vary widely, and similarly the costs of installation are influenced by the diversity of the establishments.

Although it was not possible to conduct a thorough cost benefits analysis on the data we obtained in McDougall et al. (2017), our observations strongly suggest that findings from such an analysis would be positive and encouraging.

Conclusions and Future Directions

Technology in the community has both advantages and disadvantages (Aboujaoude, 2015). While there are clear benefits to be obtained by facilitating communication and acquisition of knowledge, there are however disadvantages such as the potential influence of violent video-games on aggression, online searches for health related information on levels of health anxiety, and promotion of suicide on the internet. So when implementing in new contexts we should ensure that we preserve the advantages and protect against the disadvantages.

In prisons we must acknowledge unique advantages and potential disadvantages of technology. Although the advantages in increasing efficiency and teaching prisoners digital skills are evident, there are genuine security concerns that prisoner access to technology may be misused. In a paper published jointly by the UK Prisoner Education Trust and the Prison Reform Trust it is acknowledged that access to technology and online resources can be a risk to security (Champion & Edgar, 2013). However the organizations propose that not allowing access to technology poses a greater risk of prisoners reoffending after release. They suggest that prisons need to concentrate on how the risks to security can be managed in order to allow use of Information and Communications Technology (ICT) in rehabilitation and resettlement. Champion and Edgar (2013, p. 5) suggest the main security concerns are: attempts to use USB ports to charge illicit mobile phones; creating hidden folders to store prohibited images; using social networks to taunt or intimidate victims or witnesses; and, committing further crimes or planning an escape. They accept that these are genuine concerns which must be managed, but make a strong argument for introducing controlled access to the internet.

On the other hand, the suppliers of digital technology recognize the concerns of the criminal justice system about the security risks, and aim to provide equipment that addresses the above concerns. So, the self-service kiosks they provide do not have access to the

internet, but they can operate functions safely and securely thus giving prisoners more control over their lives in prison without having internet access. The suppliers claim also to be able to address the security issues if required. The digital self-service systems have existed in custodial environments for twelve years, and the suppliers state that in that time there have been no incidents other than minor security breaches as a result of the technology. The evidence provided in this chapter that the use of technology in prisons can have a beneficial impact on behavior in prison and on subsequent release should encourage the further development of safe and securely managed technology.

A further concern that has often been expressed in criminal justice with the introduction of technology, is that this will hinder or inhibit interactions between staff and prisoners. Many officers and prisoners would disagree with this view. Both groups have said that most of the tensions that occur between them are due to the existing error-prone paper-based application systems. As one prisoner said in a focus group before the introduction of the technology, 'if I can't get my visits or there is a mistake in my pay, the only thing I can do is shout at a prison officer, even though it is not his fault'. It was recognized that these frictions were likely to be much reduced with introduction of the prisoner self-service system.

What did concern both officers and prisoners was that the additional officer time provided by the kiosks might be taken up with further administrative tasks. Prisoners hoped that the extra time available would lead to more visibility of officers on the landings, as this made them feel safer. Some said they would like more social interaction with officers, stating: 'just occasionally asking how you are makes a big difference to the atmosphere on the wing'. Similar sentiments were found in another study, noting that prisoners appreciated the daily civilities from officers like simply saying 'good morning' (Tait, 2008). Officers said that they would welcome updated training in personal officer skills, as these had not been used by many for some time, and they wanted to be informed of best practice.

Additionally there appeared to be some emerging opportunities for educational and rehabilitative initiatives surrounding the use of kiosks. The functions on the kiosks often mirror the situations in the community that prisoners will face on release, and this presents an opportunity to use ‘real-life’ situations to give training and advice. For example, some prisoners admitted to not managing their finances well on the kiosks, and recognized a need to take control of this aspect of their lives. They had a limited weekly amount of money allowed from their spending account, and found that it was impossible to stay within their means. With the additional freedom to make telephone calls, and choose from a wider range of purchases in the prison shop, they were quickly running out of money. Financial management programs in prison might assist prisoners struggling with over-spending, and the technology could provide a ready means of applying and monitoring prisoner learning. Similarly, some prisoners were having difficulty with reading messages quickly and ordering meals and items from the canteen at the speed necessary to avoid screens timing out. Education staff observed that they were receiving many more applications for basic reading lessons now that reading had become of more practical importance in the daily life of the prisoners (McDougall & Pearson, 2014).

The UK Justice Secretary has supported introduction of an incentives system which would offer small rewards for becoming involved in a rehabilitative regime, including offending behavior programs, and in the newly introduced Education and Employment Strategy (Gauke, 2018b). The vision at the heart of this strategy is ‘to put offenders on a path to employment as soon as they set foot in prison’ (Gauke, 2018b, p.3), and incentives will encourage this.

Research into the value of ICT facilities in prison class-rooms suggests that the mere presence of ICT does not necessarily facilitate learning. Batchelder and Rachal (2000), in a rigorous experimental study, examined whether the use of ICT had more impact than

traditional teaching methods. They found no statistically significant difference. However, in the case of kiosks where the IT is being used to assist prisoners in achieving their daily goals, there may be more personal incentive to learn.

Behavior monitoring in Category D prisons (lowest category) has become an important part of the England and Wales risk assessment process prior to parole release and release on temporary licence, as an indicator of risk of future reoffending. The self-service kiosks offer a valuable opportunity to monitor behavior and assess prisoner risk prior to release. Research has already demonstrated that there is a correlation between behavior of offenders in prison, both positive and negative, and their behavior subsequently in the community (McDougall, Pearson, Willoughby & Bowles, 2013). Links to reduced reoffending, including involvement in purposeful activities such as applications for education, work-related training, offending behavior programs, and making appointments with an offender manager, could all be monitored from the kiosks. For example, evidence of these behaviors, together with a reduction in adjudications, could be seen as positive indicators of reduced risk. The early willingness demonstrated by prisoners to use the kiosks should be encouraged in order to maintain and extend the initial positive impact on prisoner behavior.

Currently, personal officers and psychologists are hard-pressed to interact with the number of offenders requiring assessment, support and rehabilitation. Psychologists undertake psychometric assessments, which could be achieved by self-completion on the part of prisoners. Self-completion has already been explored by King (2016) who demonstrated that the Risk Need Perception Survey, informed by the RNR model (see Bonta & Andrews, 2017), was able to record self-perceived and evaluator-perceived criminogenic needs. King et al. (2017) have also evaluated the use of these self-completed psychological assessments, using a randomized controlled trial ($N= 212$) to examine the difference between prisoners

completing psychological assessments on tablet computers and those using paper-and-pencil methods. They found that there was no significant difference in the psychometric risk responses between the two approaches. In terms of usability, completions using paper-and-pencil were faster, but there were more frequent item omissions. Those in the tablet condition rated their format much more favorably than paper-and-pencil participants, and across both groups there was a preference for using the tablet computers. Although non-significant statistically, there was a small to medium higher level of attitude to correctional rehabilitation in the tablet computer group following completion of questionnaires. This study gives support to the use of tablet computers in psychometric risk self-assessment.

Similarly, applications that administer therapy in clinical situations are in development (Gilbody, 2015; Morris & Kaur Bans, 2018). Many of the approaches have not yet been evaluated, however positive results were found using touch-screen daily self-reporting by patients suffering from depression who were receiving group cognitive behavioral therapy in a clinical setting (Newnham et al., 2012). In a trial with 1,308 patients, it was found that collaborative dialogue between patients and therapists and regular feedback via the technology was effective in reducing symptoms in patients at risk of poor outcomes. The patients also recorded a positive reaction to using the technology. This appears to indicate potential for development in application to rehabilitative programs for offenders.

Although there have been some successes in incorporating technology into therapy, Gilbody (2015) found that results were less encouraging when the design was rigorous. In a randomised controlled trial, he found that cognitive behavior therapy provided by two separate technology programs provided no added value to that of the service provided by primary general practitioner care alone. Evaluation appeared to suggest that the drop-out rate was higher using a computer-based treatment (Gilbody, 2015). There has so far been limited use of technology in rehabilitation programs for offenders, and hence limited evaluation

(Morris & Kaur Bans, 2018). This needs to be thoroughly explored, as there could be a potential to reach a larger number of prisoners, than is currently possible.

In summary, the information presented in this chapter supports the view that securely and safely managed use of technology in prisons can be beneficial for both staff, prisoners and society, and can assist management in normalizing the prison culture to provide efficiencies and an environment that is conducive to effective rehabilitation. As well as being welcomed at a personal level by the majority of management, staff and prisoners, improved behavior in prison and on release is illustrated by statistically significant positive changes in performance measures. There is the potential for improved education, assessment and rehabilitative programs, within the managed security of the systems. Those prisoners who gain confidence and new skills are to be encouraged, and those who struggle with the additional personal responsibilities require support. The introduction of technology will not work for all, but it presents an opportunity that should be welcomed.

References

- Aboujaoude, E. (2011). *Virtually you: The Dangerous Powers of the E-Personality*. New York: W. W. Norton & Co.
- Aboujaoude, E., & Starcevic, V. (2015). *Mental health in the digital age: Grave dangers, great promise*. New York: Oxford University Press.
- Agnew, R. (2006). *Pressured into crime: An overview of general strain theory*. New York: Oxford University.
- Andrews, D. A., & Bonta, J. (2010). *The psychology of criminal conduct* (5th ed.). New Providence, NJ: LexisNexis Matthew Bender.
- Batchelder, J.S., & Rachal, J.R. (2000). Efficiency of a computer assisted instruction programme in a prison setting. *Adult Education Quarterly*, 50, 120.
- Bonta, J., & Andrews, D. A. (2017). *The psychology of criminal conduct* (6th ed.). New York: Routledge. ISBN 9781138935778.
- Bouffard, J.A., Taxman, F., & Silverman, R. (2003). Improving process evaluations of correctional programs by using a comprehensive evaluation methodology. *Evaluation and Program Planning*, 26 (2) 149-161. DOI: 10.1016/S0149 (03)00010-7.
- Champion, N., & Edgar, K. (2013). *Through the gateway: How computers can transform rehabilitation*. Prison Reform Trust and Prisoners' Education Trust.
<https://fbclientprisoners.s3.amazonaws.com/Documents/CQ%20through%20the%20gateway%20WEB1.pdf>. Accessed 1 July 2017.
- Coates, S. (2016). *Unlocking potential: A review of education in prison*. London: Ministry of Justice. <https://www.gov.uk/government/publications/unlocking-potential-a-review-of-education-in-prison>
- Cochran, J. C., Mears, D. P., Bales, W. D., & Stewart, E. A. (2014). Does Inmate Behavior

Affect Post-Release Offending? Investigating the Misconduct-Recidivism Relationship among Youth and Adults. *Justice Quarterly*, 31(6), 1044-1073. doi: 10.1080/07418825.2012.736526

Dubourg, R. & Hamed, J. (2005). Estimates of the economic and social costs of crime in England and Wales: Costs of crime against individuals and households, 2003/04. Home Office Online Report 30/05.

<http://webarchive.nationalarchives.gov.uk/20100413151441/http://www.homeoffice.gov.uk/rds/pdfs05/rdsolr3005.pdf>.

French, S. A., & Gendreau, P. (2006). Reducing prison misconducts: What works! *Criminal Justice and Behavior*, 33 (2), 185-218. doi: 10.1177/0093854805284406

Gauke, D. (March, 2018 a). *Prisons Reform Speech*. London: Royal Society of Arts.

<https://www.gov.uk/government/speeches/prisons-reform-speech>

Gauke, D. (May, 2018 b). *Education and Employment Strategy. Presented to Parliament by Justice Secretary*. London: Ministry of Justice.

Gauke, D. (July, 2018 c). *From sentencing to incentives – How prison can better protect the public from the effects of crime*. London: Centre for Social Justice.

<https://www.gov.uk/government/speeches/justice-secretary-launches-fresh-crackdown-on-crime-in-prison-speech>

Gilbody, S. (2015). Computerised cognitive behavioural therapy (cCBT) as treatment for depression in primary care. (REEACT trial): large-scale pragmatic randomized controlled trial. *BMJ* 351 doi: <https://doi.org/10.1136/bmj.h5627>.

Gojkovic, D., Meek, R., & Mills, A. (2011). *Offender engagement with third sector organisations: A national prison-based survey*. Third Sector Research Centre Working Paper 61.

<https://www.birmingham.ac.uk/generic/tsrc/documents/tsrc/working-papers/working-paper-61.pdf>.

Heil, P., Harrison, L., English, K., & Ahlmeyer, S. (2009). Is prison sexual offending indicative

of community risk? *Criminal Justice and Behavior*, 36(9), 892-908. doi:

10.1177/0093854809338989

Helsper, E. J., & Eynon, R. (2013). Distinct skills pathways to digital engagement.

European Journal of Communication, 28(6), 696-713.

Howard, P., Francis, B., Soothill, K., & Humphreys, L. (2009). *OGRS 3: The revised Offender*

Group Reconviction Scale (research summary 7/09). London: Ministry of Justice.

Hulley, S., Liebling, A., & Crewe, B. (2012). Respect in prisons: Prisoners' experiences of respect in public and private sector prisons. *Criminology and Criminal Justice*, 12(1), 3-23. doi: 10.1177/1748895811423088

Hussey, M. A., & Hughes, J. P. (2007). Design and analysis of stepped wedge cluster randomized trials. *Contemporary Clinical Trials*, 28(2), 182-191. doi:

<https://doi.org/10.1016/j.cct.2006.05.007>

Jewkes, Y., & Reisdorf, B.C. (2016). A brave new world: The problems and opportunities presented by new media technologies in prisons. *Criminology & Criminal Justice*,

16(5), 534-551. <https://doi.org/10.1177/174889581665495>.

Joliffe, D., Farrington, D.P., & Howard, P. (2013). How long did it last? A 10-year reconviction

follow-up study of high intensity training for young offenders. *Journal of*

Experimental Criminology, 9(4), 515-531.

King, C. M. (2016). The prediction of criminal recidivism using self- and evaluator appraised risk and needs. *Doctoral dissertation*.

<http://search.proquest.com/docview/1790102519>. Accessed 1 July 2017.

King, C. M., Heilbrun, K., Kim, N. Y., McWilliams, K., Phillips, S., Barbera, J., & Fretz, R. (2017). Tablet computers and forensic and correctional psychological assessment: A randomized controlled study. *Law and Human Behavior*.

<https://doi.org/10.1037/lhb0000245>.

Knight, V. (2015). Some observations on the digital landscape of prisons today. *Prison Service Journal*, 229, 3-9.

Lipsey, M., Landenberger, N. A., & Wilson, S. J. (2007). *Effects of Cognitive-Behavioral Programs for Criminal Offenders: A Systematic Review*. The Campbell Collaboration Library: available from <http://www.campbellcollaboration.org/lib/project/29/>

Listwan, S.J., Sullivan, C.J., Agnew, R., Cullen, F.T., & Colvin, M. (2013). The pains of imprisonment revisited: The impact of strain on inmate recidivism. *Justice Quarterly*, 30(1), 144-168. <https://doi.org/10.1080/07418825.2011.597772>.

Losel, F., Pugh, G., Markson, L., Souza, K.A., & Lansky, C. (2012). *Risk and protective factors in the resettlement of imprisoned fathers with their families*. Ormiston Children's and Families Trust, Milton. Accessed 1 July 2017 from Google Scholar.

Mann, R. E., Webster, S. D., Wakeling, H. C., & Keylock, H. (2013). Why do sexual offenders

refuse treatment? *Journal of Sexual Aggression*, 19(2), 191-206. doi:

10.1080/13552600.2012.703701

McDougall, C., & Pearson, D. A. S. (2014). *Process Evaluation: The prisoner custodial management system (CMS)*. Unpublished Process Evaluation Report.

- McDougall, C., Pearson, D. A. S, Torgerson, D. J., & Garcia-Reyes, M. (2017). The effect of digital technology on prisoner behavior and reoffending: a natural stepped-wedge design. *Journal of Experimental Criminology*, 13(4), 455-482.
- McDougall, C., Pearson, D.A.S., Willoughby, H., & Bowles, R.A.B. (2013). Evaluation of the ADViSOR project: Cross-situational behaviour monitoring of high-risk offenders in prison and the community. *Legal & Criminological Psychology*, 18(2), 205-228.
- Molleman, T., & van Os, R. (2016). *Technological disparity across Prison Services*.
<https://www.euopris.org/file/technological-disparity-across-prison-services/>
- Morris, J., & Kaur Bans, M. (2018). Developing digitally enabled interventions for prison and probation settings: A review. *Journal of Forensic Practice*, 20(2), 134-140.
<https://doi.org/10.1108/JFP-08-2017-0030>.
- National Offender Management Service (2015). *Prison Service Instruction Enhanced behavior monitoring*. London: NOMS. Accessed November, 2018:
<https://www.justice.gov.uk/downloads/offenders/psipso/psi-2015/pi-16-2015.pdf>
- Newnham, E.A., Doyle, E.L., Adelln, A.H.Sng., Hooke, G.R., & Page, A.C. (2012). Improving clinical outcomes in care with touch-screen technology. *Psychological Services*, 9(2), 221-223.
- Petersilia, J. (2016). Realigning corrections, California style. *Annals of the American Academy of Political and Social Sciences*, 664(1), 8-13.
DOI:10.1177/0002716215599932
- Prendergast, M.L., Hall, E.A., Wexler, H.K., Melnick, G., & Cao, Y. (2004). Amity prison-based therapeutic community: 5-year outcomes. *The Prison Journal*, 84(1), 36-60.
- Reisdorf, B.C. & Rikard, R.V. (2018). Digital rehabilitation: A model of reentry into the digital age. *American Behavioral Scientist*, 1-18/. DOI: 10.1177/0002764218773817.
- Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis: Modeling change*

and event occurrence. New York: Oxford University Press.

Tait, S. (2008). Care and the prison officer: Beyond 'care bears' and 'turn-keys'. *Prison Service Journal* 180: 3–11.

Wolff, N., Shi, J., & Schumann, B. E. (2012). Reentry preparedness among soon-to-be-released inmates and the role of time served. *Journal of Criminal Justice*, 40(5), 379-385. <https://doi.org/10.1016/j.jcrimjus.2012.06.008>.