The use of mobile technologies to overcome digital inequities in prison education: a pilot project

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ABSTRACT
Incarcerated students face a number of additional challenges to those faced by most other students studying at a distance. Lack of internet access is especially problematic for those studying in a sector that is increasingly characterised by online and flexible course offerings. In this paper, we report on a project that will attempt to address the digital challenges that hinder prisoner access to higher education and provide inclusive learning experiences for incarcerated students. The trial utilises mobile yet secure digital technologies – namely Stand-Alone Moodle (SAM) and e-book readers – to improve access to resources. It is being trialled with a small sample of incarcerated students participating in the *Studying to Succeed* course within the Tertiary Preparation Program (TPP) at the University of Southern Queensland (USQ). We discuss the current provision of higher education in prisons and the challenges resulting from increased reliance on mobile learning technologies in higher education generally. The potential of the trial project to address the digital divide experienced by incarcerated students as compared to the general student population will also be discussed. It is hoped that students will be participating in learning experiences more closely related to those experienced by students outside of the prison system and they will be acquiring e-literacy and e-research skills. In addition, USQ will be fulfilling its obligation in relation to equity of access; and will be addressing the Australian Government's agenda of increasing participation in higher education by socially and economically disadvantaged groups.

Author Keywords
digital inclusion; distance learning; higher education; prisons; Moodle; e-book readers, m-learning

INTRODUCTION
Australia's prison population averaged 29,106 adult prisoners in 2011 (ABS, 2011). Though imprisonment rates have fallen for the first time in a decade, the percentage of incarcerated offenders is still high, with a national imprisonment rate of 167 prisoners per 100,000 adults. The majority of prisoners are from low socio-economic status (SES) backgrounds and are more likely to face social and economic disadvantage. Many offenders have limited skills and an average education level of year 10 or below. As a result, they experience a greater chance of unemployment on release, face on-going health and social problems, and have limited work experience (Giles, Le, Allan, Lees, Larsen & Bennett, 2004). Each of these factors contributes significantly to recidivism. Though early research was inconclusive, most contemporary literature demonstrates that the rates of recidivism are significantly lower for prisoners undertaking a post-secondary educational program while incarcerated, as compared to the general prison population (Richards et al., 2008; Aceves et al., 2011). This is in part due to increased employment success upon release as a consequence of completing a post-secondary qualification (Batiuk et al., 1997). Distance education has traditionally been viewed as a boon to education in prisons, delivering education and resources to students that are unable to undertake traditional face-to-face education (Salane, 2008).

However, the increasing reliance of distance learning institutions on e-learning including the use of m-learning, virtual learning environments (VLEs), interactive online activities and online course delivery has resulted in greater challenges for incarcerated students attempting to participate in higher education. Access to mobile technologies within prisons for prisoner learning is severely restricted due to a range of security concerns and resultant policies. Almost universally, prisoners are not permitted access to the internet or to the mobile devices that potentially can access it such as mobile or smart phones, iPads, iPods, e-book readers or tablet computers. Beyond the perceived risks associated with the ability to access the internet, these devices pose other security risks such as batteries being adapted for use with bespoke tattoo guns, storage capacity being used for banned materials such as games or pornography, or charging cords being used as weapons. Learning initiatives utilising ICTs often pose an unacceptable security risk and consequently, there is very little literature about the use of technology, particularly mobile technologies, in correctional facilities (Rozalski, 2005).

This paper describes the design and development of a pilot project, PLEIADES (Portable Learning Environments for Incarcerated Distance Education Students), designed and developed by the University of Southern Queensland to address some of the barriers to participation in higher education by incarcerated students. The aim of the project is to trial the use

of e-learning technologies, including mobile technologies, which are independent of the internet, yet still enable students to access USQ courses electronically. These technologies are initially to be used in prisons but could be adapted for other learning environments in which students cannot readily access the internet; such environments might include regional, rural and remote areas in Australia. The learning technologies to be piloted include an internet-independent version of USQ's Virtual Learning Environment (VLE) specifically developed for the project, called Stand-Alone Moodle or SAM. SAM will replicate USQ's online learning environment for incarcerated students enrolled in the Tertiary Preparation Program. It will enable students to view and use the same course materials, learning activities and assessments embedded in the USQ VLE but in a simulated online environment without having any possibility of gaining access to the internet. The use of SAM in PLEIADES will also be supported by the use of e-book readers. The e-book readers chosen for this project have no wireless or 3G connectivity capabilities but will enable students to access course and reference materials in order to extend learning beyond the computer lab and into personal and leisure time (for example, after routine daily lock-down). In this way, an equivalent learning experience will be provided for incarcerated students as compared to non-incarcerated students at studying the same programme at USQ. The project will be deployed in Semester 2 2012 (July to November) with a maximum cohort of fifteen incarcerated students enrolled in course TPP7120 *Studying to Succeed* as part of the Tertiary Preparation Program at the Southern Queensland Correctional Centre (SQCC). SQCC is located about an hour's drive from the Toowoomba campus of the University of Southern Queensland. It is a high-security, all-male prison with some 300 beds. It is Queensland's newest prison and will be one of a number of prisons located in the 680 hectare Southern Queensland Correctional Precinct to be operated by Serco Australia Pty Ltd (Department of Community Safety, 2012).

CURRENT PROVISION OF TERTIARY EDUCATION IN PRISONS
One of the roles of prisons is to provide an effective environment that reduces the risk of reoffending. Changes in the corrective services sector in Australia over the past decade has resulted in an increase in the adoption of 'thoroughcare' strategies. These involve the provision of programmes and opportunities to offenders that address the cause of offending, reduce the risk of re-offending and maximise successful re-integration into the community (Callan & Gardner, 2007). The role of education in prisons serves two purposes: increasing opportunities for employment after release, but also most importantly, improving self-esteem and self-confidence to assist in avoiding the negative lifestyle temptations that contributed to the initial incarceration of offenders (Callan & Gardner, 2007). As a result of this change in priorities, a greater emphasis has been placed on education opportunities for prisoners including programmes featuring career counselling, mentorships and career placement. Studies have found that these programs, particularly participation in formal education programmes, have generally been successful in reducing recidivism (Australian Institute of Criminology, 2008; Callan & Gardner, 2007). Even so, participation in education remains low with just 35% of eligible prisoners in 2009-10 participating in accredited education and training courses. The highest participation rate was in vocational education and training courses (27%), 6% participated in secondary school education, 3% in pre-certificate Level 1 courses and only 2% participated in higher education (SCRGSP, 2008). The decision to participate in formal education depends on a number of factors including the length of a prisoner's sentence, the constraints of sentence management plans, the capacity of education officers, the demands and flexibility of prison jobs and most importantly, the availability of programmes and courses (Giles et al., 2004). Interviews conducted with prisoners involved in vocational education and training (VET) programs indicate that education is viewed as broadly positive, resulting in great personal satisfaction, improved self-esteem and conducive to further study while in prison (Cox & Carlin, 1998). Overcrowding in prisons and restricted access to equipment, particularly computers and other technologies, further limits prisoner access to education (BearingPoint Review, 2003). Prisoners are hampered in their choice of programme by the extent to which component courses require students to access online learning activities.

Correctional centres across Australia are largely reliant on tertiary institutions for the provision of external studies or distance education for offenders who wish to participate in higher education (Dorman & Bull, 2003). Preparatory, undergraduate and some postgraduate programmes have traditionally been accessible to prisoners in print-based forms, sometimes supplemented by CDs (for use with in-cell laptops or in computer labs), audiotapes or videotapes (Dorman & Bull, 2003). These materials are sometimes supplemented by visits from tertiary teaching staff depending on the location of the tertiary provider in relation to the correctional centre. Due to procedural restrictions that prohibit prisoner access to the internet, prisoners in most Australian jurisdictions including Queensland, cannot access on-line or mobile learning. Formal education and training delivery to prisoners in these jurisdictions is currently provided in traditional, non-digital forms using large volumes of printed materials. This is becoming increasingly problematic given the increasing reliance on digital and mobile delivery of materials and assessment.

INFORMATION TECHNOLOGY AND LACK OF INTERNET ACCESS AS BARRIERS TO PRISON EDUCATION
Higher education institutions are increasingly incorporating e-learning, m-learning and other digital technology initiatives in order to remain competitive in modern knowledge-based economies. The education sector is depending on the inclusion of e-learning to expand and widen access to higher education and training for students; improve the quality of offerings and to reduce costs (Larsen & Vincent-Lancrin, 2005). The University of Southern Queensland is no exception. The 'Digital First' and 'USQ Connected' initiatives are both representative of the broader sector's increased reliance on online and mobile delivery. Though the increased use of technology in distance education does help address the emerging

demand for mobility and flexibility in learning, at the same time it excludes significant portions of the student population including incarcerated students (Aceves et al., 2011). Because of this, incarcerated students have fewer options than ever before. Currently, supporting incarcerated students to successfully undertake university or other distance education studies, requires education officers at correctional centres to spend a great deal of time liaising with committed and sympathetic individuals in universities or other education or training providers, carry out the online research that students need to fulfil the demands of the course, and then print out that information for the students. As a consequence of these demands, the quality and provision of higher education initiatives to correctional centres is largely dependent on the goodwill and capacity of education officers and the correctional centres employing them. A major challenge for future distance education provision to this cohort is to identify alternatives that will allow prisoners to access learning management environments and electronic resources while maintaining the necessary security. Although the traditional forms of delivery using hard-copy 'blocks' of materials are successful to a certain extent, they do not enable incarcerated students to develop the technological skills and e-literacy skills that are essential to formal learning in current Australian education and training environments. Access to information and communication technologies within prisons for use in education is severely restricted. Most prison education centres provide access to computers which inmates may access for a limited number of hours under strict supervision and some prisons run in-cell laptop programmes for students engaged in tertiary studies (BearingPoint Review, 2003).

Incarcerated students are unable to access course materials and multimedia supplied via the course VLE (at USQ an instance of Moodle called the 'Study Desk') and they are unable to complete assessment online. Most significantly, they are unable to communicate with other students outside of the facility and even within the facility through course discussion boards. This undermines the social constructive pedagogy favoured in many post-secondary programmes (Erisman & Contardo, 2005; Bowden, 2002) and poorly prepares students for a world in which employers expect their employees to be familiar with social networking and other web 2.0 resources. The imperative to address this digital divide for these students is acute. How can correctional facility security be maintained while still providing incarcerated students with the benefits of learning with digital technologies? The PLEIADES project is an attempt to reconcile these competing needs.

ADDRESSING DIGITAL INEQUITIES USING SECURE LEARNING TECHNOLOGIES

Background to the project

The PLEIADES project resulted from discussions between staff at the Southern Queensland Correctional Centre (SQCC), Queensland Corrective Services (QCS), the Australian Digital Futures Institute (ADFI) and the Open Access College (OAC) the latter two both at USQ. The University of Southern Queensland is a dual mode institution that delivers both on-campus and distance education and has a high proportion of students from low socio-economic status (SES) backgrounds or from rural and geographically isolated areas. USQ has sought actively to support students in disadvantaged or vulnerable groups through the provision of a tertiary pathway beginning with a Tertiary Preparatory Program (TPP) articulating into various degree pathways. TPP is offered by the OAC to prospective students of the University of Southern Queensland over the age of 18 who cannot gain entry via the traditional pathways. If students complete the core components of the programme, they are awarded automatic entry to certain undergraduate programs at USQ (Orth & Robinson, 2010). Students enrolling in the TPP often have less developed academic skills than their undergraduate colleagues (Bedford, 2007) and require significant academic and social support to complete their courses successfully (Mehrotra et al., 2001). Typically, these students are from low SES backgrounds and may have experienced educational disadvantage (Klinger & Wache, 2009). If the TPP is to prepare students for university studies that incorporate the use of the online Study Desk and other digital resources, then developing e-literacy skills have to be an integral part of the course (Orth & Robinson, 2010). A significant number of incarcerated students from Queensland and other Australian states enrol in the TPP, and for this cohort in particular, these aims can be difficult to achieve. The course which is the focus of the PLEIADES project is TPP7120 *Studying to Succeed*.

TPP7120 *Studying to Succeed* is offered online and externally in semesters 1 (February to June), 2 (July to November) and 3 (December to February) every year. USQ uses the Moodle VLE to provide a Study Desk for each course. The Study Desk is an online resource that allows student access to lecturers, colleagues, related websites, quizzes, and many other useful resources. A Moodle template enables the Study Desk to display properly on mobile devices. It is a vehicle through which lecturers can keep students motivated as well as provide support and enrichment throughout the course (Orth and Robinson, 2010). Currently, an internet connection is required to access the Study Desk. Because incarcerated students have no access to the internet, they have not been able to access the Study Desk for this or for other courses. The project partners have discussed various ways to overcome this deficit for incarcerated students. To date, students have received large blocks of printed matter containing course materials and resources. This is costly for USQ to assemble, print and post, and is in no way interactive. Students enrolled in the same course have little contact with each other and certainly do not get to leverage the social support that is engendered by using the discussion boards on the course Study Desk site.

Stand-Alone Moodle

The project team determined that in order to provide an equivalent study experience for incarcerated students as compared to non-incarcerated students enrolled in *Studying to Succeed*, it would be necessary to somehow replicate the course Study Desk. This alternate instance of the Study Desk would necessarily need to be self-contained with no possible communication to the internet. It would have to be wholly contained on the Correctional Centre education server with installation and harvesting of results being conducted using flash drives by USQ's Division of ICT or SQCC education personnel. This instance of Moodle 2.2, which could be considered to be a 'satellite' instance of the main instance of the Study Desk was called SAM for Satellite Moodle, but eventually was renamed Stand-Alone Moodle in order to allay fears about security.

Within Australia, each state and territory has its own prison system. USQ has been working closely with Queensland Corrective Services to define the features and functionality of the Stand-Alone Moodle Study Desk that would comply with ICT and security constraints in that state. This modified VLE will be installed on the standalone educational server at the new Southern Queensland Correctional Centre to be located near the small town of Gatton and will be accessed via the network of computers available to students in a designated education lab located at the correctional centre. At designated times, incarcerated students will be able to access course materials including study modules, course readings and multi-media files, as well as complete quizzes and participate in discussion boards via the SAM VLE. The discussion boards will only be accessible to the incarcerated students while located in the correctional centre's education computer lab and under the direct supervision of the centre's education officers. These measures will be taken to ensure that discussion forums are used appropriately, bearing in mind that 'inappropriate use' could not possibly include internet use. It is expected that education officers will 'strip' the course assessment items prepared by students from the correctional centre instance of SAM and submit them directly into the USQ online assignment submission system. Education officers will have additional administrative rights to this system to streamline the process. In this way, incarcerated students will be able to gain many of the e-literacy skills they will need in their future studies and employment. They will be able to gain these skills in a simulated online environment without having or needing access to the internet, thus completely avoiding those security risks engendered by prisoner access to the internet.

e-Book Readers

Though the Stand-Alone Moodle system goes much of the way to fostering the e-literacy skills lacking incarcerated students, a lack of e-research skills in this cohort is still perceived to be a significant problem. Students within correctional centres, in common with many students outside of the corrections system, are often juggling part-time study with work commitments. In response to an increasingly diverse student cohort, USQ is exploring ways of delivering course content so that it can be consumed on a range of mobile devices. The intent is that content is created once and then delivered through multiple channels for consumption by the student according to his or her preference, device type and availability. These options for flexible and mobile delivery are not available to the student studying within a correctional centre. An incarcerated student undertaking a part-time study program may only have access to the relevant computer lab one afternoon a week if he or she is working full-time in addition to studying. There is an in-cell laptop computer borrowing scheme that some incarcerated students are able to access. Even so, the opportunities to extend learning beyond the correctional centre education lab are limited and laptops are not available to students enrolled in the TPP programme (these are reserved for students enrolled in degree programmes). In response to this need, the PLEIADES project team will pilot an e-book reader scheme to run in conjunction with the Stand-Alone Moodle trial. In this way, incarcerated students will have some experience of a mobile device, and have the opportunity to develop the e-literacy and e-research skills required in the contemporary workplace or in further study.

e-Book readers or e-readers are small portable electronic devices which can hold a large number of electronic files such as electronic books (e-books). The e-book readers in the trial will be loaded with course study materials and additional study resources of potential use to the students. The e-book readers selected for use in the trial are Sony PRS-505s, chosen because they do not have any ability to connect to the internet either via wireless or 3G networks. In addition they cannot connect remotely to another device other than through a specific cable which will be retained by the education officers. In fact, their lack of connectivity means that they are no longer manufactured. Should the pilot be scaled up, an alternative model of e-book reader would need to be found. Though there are a number of e-book readers that have no connectivity by default, nearly all have SD card slots which pose an unacceptable security risk as contraband materials could be loaded onto the e-book reader. In the future, SD card slots would need to be bound by security tape or otherwise plugged. Updates to the e-book reader will only be carried out when new course materials are released (approximately once a year) and this updating will be conducted by the education officers. The Sony ebook reader will not enable the incarcerated students to communicate with others or send or receive emails. It has a long battery life that can be measured in weeks or months depending on the level of use. The e-book reader batteries are an integral part of the device and cannot be removed or modified without damaging it. In addition the Sony e-book reader allows students to use a text-to-voice feature and it is anticipated that this feature will be useful for students with low levels of literacy.

The device supports a wide range of file types including Portable Document Format (PDF) and ePub (short for electronic publishing). The ePub format is integral to the PLEIADES project because it can support interactivity. Study-support resources such as self-marking quizzes and multimedia files (for example, lecturers' video-clips and Adobe Presenter

presentations) can be embedded within the ePub files. Current course materials are stored on the Study Desk at PDF files. These are unsuitable for the e-book readers as viewing them requires the reader to scroll across the page for every line. The text does not reflow to accommodate the screen size making it a very tedious process to read a document. Before being converted into PDFs to be placed into the Study Desk, the course files are in Open Office format with a .odt file extension. In order to convert those original .odt files into ePub format, they must first be converted into .rtf files. Images are saved separately from the text and the text files are imported into the desktop publishing programme, in this case Pages on a Mac. The images are then reintegrated with the text and the files are exported as ePubs. A library is established in another programme called Calibre and the ePubs are imported and subsequently deployed onto the e-book readers.

For the pilot project, course materials and associated reference material will be vetted for copyright compliance and converted into ePub format for loading onto the Sony e-book readers to be provided to incarcerated students enrolled in the TPP7120 *Studying to Succeed* course. A migration from printed materials to digital resources could deliver benefits to correctional centres in addition to those afforded to incarcerated students. If correctional centres started replacing printed library books with e-books on e-book readers, for example, there would be fewer places for inmates to hide contraband, and more space freed up in prison libraries where space is frequently at a premium.

An e-book reader borrowing scheme will be set up by education officers at the Southern Queensland Correctional Centre, similar to the one that already operates to manage the borrowing of in-cell laptops. Each student borrowing an e-book reader will be required to enter into an agreement that transfers responsibility for the e-book reader to the student with penalties when the e-book readers are damaged. The e-book readers are charged using a cord that plugs into a USB port of a computer; in this case, an education officer's computer. Students using the devices will be able to hand their e-book readers to education officers on specified days for charging. The students will not have access to the cords used for charging the devices. They will be able to take the e-book readers back to their cells to browse readings, watch embedded multimedia, take notes on readings and thereby extend their study into their private time, outside of the correctional centre's computer lab.

EVALUATION
The pilot project will be deployed in July 2012 at the Southern Queensland Correctional Centre. An evaluation of the trial project will be carried out, involving the correctional centre education staff, the incarcerated students involved in the project, the course lecturers, and correctional staff responsible for IT security. Much of the research conducted in correctional centres fails to reflect the views of prisoners themselves (Richards et al., 2008). Consequently, ethical clearance has been obtained from USQ and the Department of Corrective Services so that quantitative and qualitative data can be collected from education officers, course lecturers and most importantly, from the students themselves.

CONCLUSION
In addition to incarcerated students, USQ delivers programmes to a large cohort of students from regional, remote or rural areas within Australia as well as internationally. These students are frequently from low socio-economic backgrounds where they also often experience difficulties in gaining access to the internet or using mobile devices. USQ and other distance education providers therefore need to address the issue of lack of internet access if they are to continue to remain viable providers of higher education within these environments. At present there are very few other prisons in Australia or globally that have successfully implemented electronic or mobile learning for incarcerated students.

At present, USQ expends large sums of money and resources on printing materials for students and providing individual alternatives to students who are unable to access online resources either from their desktop or mobile devices. USQ personnel are independently developing alternative approaches on a case by case basis without support from USQ policy or processes. The development and utilisation of secure learning technologies such as SAM and internet independent e-book readers for prison education will result in improved quality and consistency of educational initiatives, encourage student-centred learning and provide learning opportunities that can be tailored to a student cohort that have greater educational needs than the general community.

The project will be evaluated using a design-based evaluation methodology to determine whether these learning technologies are able to improve access, retention and completion rates of incarcerated students as well as give them an experience comparable to that of distance students who are not incarcerated. Results from the project outcomes will inform the University and wider stakeholders on innovative technological approaches to enhancing the digital inclusion of learners who cannot access the internet, and of the needs of students in areas where internet access is not possible such as in corrective facilities, remote Australian Indigenous communities, and other rural communities.

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