A Digital Inclusion and Technological Barriers: Investigating the Challenges Faced by Formerly Incarcerated Populations in Adopting and Accessing Technology

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Abstract: Digital inclusion and technological barriers are two phenomena that directly impact the lives of the formerly incarcerated population (FIP). Adequate access means reducing the high recidivism rates already being handled through the digitization of prison education. The digitization programs offer digital skills and technical skills that can be a handful in helping the ex-offenders secure employment. On the other hand, inadequate access to digital literacy is common among ex-offenders, as most prisons are yet to offer digital education entirely. Championed with the desire to improve the lives of the FIP, this study interviews 71 participants to understand the barriers they face in adapting and accessing technology. The findings indicate that the FIP benefiting from digital inclusion has the upper hand in securing employment and reintegrating well over those hindered by technological barriers. Limited internet connectivity, inadequate financial resources to afford technology devices, limited availability of internet access points (APs), and legal restrictions are majorly reported by the 71 participants. Going by the need to improve the FIP experience, this study found that the population must undergo digital training as part of the re-entry programs.

1 INTRODUCTION

Locked in and locked out is Reisdorf and DeCook's (2022) explanation of the challenges facing Formerly Incarcerated Populations (FIP) regarding technology adoption and access. Study evidence reveals a disproportionate impact of digital inequalities among the vulnerable and marginalized, particularly the FIP, who grapple with several vulnerabilities (Reisdorf & DeCook, 2022), including age, income inequalities, inadequate education access, gender marginalization, or even disability. Annually, 600,000 individuals are released from state and federal prisons, while 9 million individuals cycle through local jails (ASPE, n.d.).

Decomposing the statistics reveals that over two-thirds of prisoners are re-arrested within three years after release (ASPE, n.d.), depicting a repeat of behaviors among FIPs. Further, the recidivism statistics point out significant flaws in prisoner-society-integration programs. Currently, correction education is praised for its effectiveness in combating recidivism.

Similarly, the Federal Bureau of Prisons (n.d.) demands that all incarcerated individuals utilize literacy programs, not going for less than 240 hours, running different programs, including vocational and occupational training, parenting, and wellness. However, inadequate digital rehabilitation programs focus on tackling the digital inequalities facing inmates beyond prison. As a result, FIPs face multiple challenges in navigating the digital society post-incarceration. Either, FIPs lack access to ICTs and the internet while in prison, depriving them of the essential skills required for survival in contemporary society (Reisdorf & DeCook, 2022).

2 PROBLEM STATEMENT

The technology gap punishes formerly incarcerated persons as they are primarily out of touch with modern tech while incarcerated due to security reasons, putting them in a disadvantageous position. The incarcerated persons have limited or no access to computers and the Internet. The limitation prevails until these individuals are released. Without the initial

digital inclusion while in prison, it becomes a gap for the FIP to survive or adapt to their communities. According to Järveläinen and Rantanen (2021), FIPs possess weak digital skills or digital IDs, while the older or those incarcerated for more prolonged periods lack motivation to pursue digital skilling, posing a significant re-entry challenge. Additionally, digital inequalities pose weak lob prospects due to digital and social exclusion (Reisdorf & Rikard, 2018).

3 STUDY OBJECTIVES

3.1 General Objectives

To investigate the challenges facing formerly incarcerated populations in adopting and accessing technology.

3.2 Specific Objectives

1. To investigate the extent of digital inclusion for formerly incarcerated populations.
2. To investigate barriers to digital adoption in prisons affecting formerly incarcerated populations post-incarceration.
3. To examine the impact of digital exclusion and technological barriers on the re-integration of formerly incarcerated populations into society.

4 THE STUDY SIGNIFICANCE

This study posits immense significance to several entities and the FIPs. Firstly, digital technology forms a fundamental aspect of modern living, virtually impacting all aspects of life, including communications, information access, and employability, among other vital facets. Through investigating the challenges inhibiting digitization among FIPs, the research is a clarion call for action among various stakeholders on the plight of FIPs post-incarceration.

The evidence in the current research addresses significant issues among FIPs, vulnerable and marginalized face. Through advising action, the study recommendation offers a recipe for enhancing social equity and broader inclusion. Additionally, successfully implementing the study report and recommendations helps tackle the high recidivism rates and improve positive engagement and

production among FIPs. Also, the study findings are useful for community organizations supporting FIPs to tailor their programs and services to address the critical issue of digital exclusion for their clients. Similarly, the results of this study offer a framework for formulating modern correctional education, re-entry programs, and rehabilitation approaches that promote digital inclusion for inmates beyond prisons, eliminating the technological divide that FIPs face.

5 RESEARCH QUESTIONS

1. What is the magnitude of digital exclusion among FIPs?
2. What are the critical barriers to digital inclusion among FIPs?
3. Is there a significant association between digital inclusion barriers and FIPs' re-entry behavior?

6 LITERATURE REVIEW

Modern everyday life, comprising economic, social, personal, and health, is deeply embedded in digital skills and technologies. Today, digital technologies are viewed as a mechanism for enhancing access, quality, and safety of everyday living, boosting the efficiency of social healthcare, among other critical public services.

According to Järveläinen and Rantanen (2021), improving inmates' digitization considerably elevates their social skills, self-esteem, rehabilitation, and society re-integration. Additionally, Ogbonnaya-Ogburu et al. (2019) highlighted that digitization helps inmates enhance their digital literacy post-imprisonment, increasing their employability and re-entry. However, Järveläinen and Rantanen (2021) annotated that FIPs face slow digitization in prison, failing to rehabilitate them for the modern digital society. Prison security employees often objected to adopting prison technology and digital development (Järveläinen & Rantanen, 2021).

According to Reisdorf and Rikard (2018), existing prisoner rehabilitation frameworks in correctional education over-target offline aspects, disregarding the digital re-entry realms. Annotatively, digital inaccessibility exacerbates the issue of digital exclusion among FIPs, creating a digital divide during re-entry (Järveläinen & Rantanen, 2021). Significant barriers to digital inclusion include inaccessibility, lack of skills, and poor attitudes. According to Järveläinen and Rantanen (2021), the

prison context also raises the issue of trust. Distrust between prison security employees and inmates inhibits digital prison adoption (Järveläinen & Rantanen, 2021).

The impact of the technological divide and digital exclusion is gross for FIPs. According to (Khaikin, 2023), FIPs' experience of the technological divide is a significant barrier to re-entry into society, who feel left behind as they grapple with re-integration. Additionally, FIPs who spend prolonged periods in prison report challenges accessing information or lag regarding basic ICT skills needed for modern livelihoods. Reisdorf and DeCook (2022) highlighted that the digital divide is a distinctive pain of current imprisonment for FIPs who virtually feel excluded from active citizens. Moreover, digital exclusion during incarceration restricts FIPs from pursuing online job listings and remote work opportunities, limiting FIPs' chances of securing stable employment opportunities and complicating their economic re-integration. Similar negative influences of digital exclusion comprise exclusion from online banking and financial handling applications (Ozili, 2018), thwarting FIPs' ability to apply modern bill management systems and credit building.

Psychologically, digital exclusion significantly raises FIPs' likelihood of suffering feelings of isolation and stigma (Seaward et al., 2023), exacerbating feelings of being left behind. These negative impacts of digital exclusion increase recidivism risks (Järveläinen & Rantanen, 2021) due to a lack of financial independence and support services, meditating return to criminal activities.

7 METHODOLOGIES

7.1 Research Design

The present study investigated FIPs' challenges in adopting and accessing technology from a quantitative research instrument due to statistical arithmetical or numerical data need. Essentially, the study's design was interested in the facts, that is, the actual level of the challenges of the FIPs, analysing the magnitude of the digital inclusion issues and quantifying the impacts of identified challenges. The study employed a cross-sectional design to ascertain and gather evidence regarding FIPs' digital exclusion claims. An essential assumption under the current design was that the gathered facts from the FIPs represented not only the views and experiences of the FIPs but also reflected the overall situation of the phenomena. However, this study appreciated that the diversity of the prison is continually changing and that FIPs are gradually reconstructing their perspectives regarding the challenges facing these populations post-incarceration.

The quantitative cross-sectional study design considered a descriptive approach to report the facts. Annotatively, the study investigated the technological barriers and digital inclusion aspects hindering the adoption and access of technology among FIPs conscious of the issue's significance among the formerly incarcerated populations. In the climax, the study intended to infer the hypothesis, making statistically valid conclusions regarding the claims.

7.2 Study Hypothesis

7.2.1 Null Hypothesis (H_0)

There is no significant association between FIPs' digital inclusion barriers and re-entry behavior.

7.2.2 Alternative Hypothesis (H_1)

A significant association exists between FIPs' digital inclusion barriers and re-entry behavior.

7.3 Population

Halcomb and Peters (2016) state that research is only possible with participants. To gather relevant data for analysis, the study population comprised formerly incarcerated individuals in America. These included individuals who are on probation, cleared/ released. The study population comprised all populations, including persons of colour and marginalized individuals.

The eligibility criteria included both men and women US citizens who have completed their prison terms and were re-integrating into society. The exclusion criteria considered inmates or individuals currently serving their terms following recidivism. Additionally, juvenile participants were excluded from the study since the juvenile might not experience the challenges of digital inclusion issues that adult FIPs undergo.

7.4 Sampling Strategy and Sample

The researcher employed a random non-probabilistic convenience sampling technique to choose study participants. The sampling strategy was utilized in the present study because the convenience sampling method allowed the researcher to gather participants based on FIPs' accessibility and willingness to

participate in the survey. Also, convenience sampling is helpful for initial exploratory research (Edgar & Manz, 2017). The researcher used an online sample size calculator, arriving at a sample size of 77 FIPs who met the study eligibility criteria.

7.5   Data Collection

For the purpose of this study, the researcher employed a study tool (questionnaire) to conduct the survey. The investigator obtained information on eligible participants by contacting each FIP that he knew and also got some contact through some individuals who know some of them. Due to the digital inequalities facing the sampled participants, the researcher had to use different means to serve them the survey: going to some residents with the paper survey and sending it electronically. This made it easy to trace the participants to complete the survey.

The participants, who could read and write, filled out the study instrument prompts for each questionnaire item. The participant resides in different geographical area (cities) around the United States namely, Maryland (Essex, Towson, Baltimore, Edgewood, Bowie, Glen Burnie), Virginia (Alenxandra and Richmond), District of Columbia, Delaware (Dover and Wilmington), Texas (Kingsville, Houston, and Corpus Christi), Georgia (Atlanta, Augusta, Macon and Savannah).

7.6   Data Analysis

The gathered data from the participants were structurally filled into Ms. Excel file for analysis. The raw data was pre-processed in Excel and imported to SPSS version 27.0 software for statistical analysis. Firstly, the analysis considered the participants' demographic characteristics, revealing various frequencies as the study sample depicted. Secondly, the investigation is conducted using descriptive statistics or relevant data features. Regarding the study hypothesis, the research undertook a cross-tab analysis reporting the Pearson Chi-Square p-value to evaluate the significance of the null claim.

8   ANALYSIS AND RESULTS

8.1   Sociodemographic Characteristics

The study sample comprised 71 formerly incarcerated populations. The study instrument was distributed to the participants who showed a response rate of 100%

(n = 71). The sociodemographic analysis results were demonstrated in Table 1 below.

The gender composition of the study participants comprised more males, 57.7% (n=41) than females, 42.3% (n=30). The age group descriptives revealed that most of the FIPs included in the study included those aged between 31 – 45, comprising 47.9% (n=34). Those aged between 18 – 30 comprised 35.2% (n=25), while 46 – 50 and 50> age groups were in equal proportions of 8.5% (n = 6) per age group. Interestingly, most of the study FIP participants were African Americans, who comprised 56.3% (n = 40). The Hispanic participants comprised 29.6% (n = 21), and the least participant sample was drawn from the Whites 14.1% (n = 10).

The study also reported that the education levels of the participants who attended primary, secondary, and vocational training in equal proportions of 28.2% (n = 20) for each educational level. Minority 15.5% (n = 11) of the FIP study participants attended attained tertiary education. The socio-demographic features also reported the durations of participants' incarceration. The study found that 45.1% (n = 32) were incarcerated for 2 – 5 years, while 23.9% (n = 17) were incarcerated for 6 – 10 years. On the other hand, 22.5% (n = 16) faced.

Most respondents revealed low digital inclusion among 67.6% (n = 48) FIPs. On the other hand, 32.4% (n = 23) reported a moderate level of inclusion, while none depicted high levels of digital inclusion, revealing high levels of digital exclusion among formerly incarcerated populations. Regarding the barriers FIPs face to technological access and adoption, 93% (n = 66) of FIPs overwhelmingly reported numerous barriers to digital adoption. On the contrary, no FIP reported any barriers to digital adoption.

The analysis also considered the impacts of digital inclusion FIPs. The descriptives revealed that 69% (n=49) of the FIPs faced rearresting challenges, while 71.8% (n = 51) had problems receiving a job offer. Additionally, 76.1 (n = 54) expressed challenges accessing vital digitized services, with a similar proportion experiencing mental health issues due to feelings of being left behind by the rest of the Population.

Table 1: Socio-Demographic Frequency Statistics.

Variable	Frequency	Percent (%)
Gender		
Male	41	57.7
Female	30	42.3
Participants' Age		
18 - 30	25	35.2
31 - 45	34	47.9
46 – 50	6	8.5
50>	6	8.5
Race		
White/Caucasian	10	14.1
Black/African American	40	56.3
Hispanic/Latino	21	29.6
Educational Level		
Primary	20	28.2
Secondary	20	28.2
Vocational	20	28.2
Tertiary	11	15.5
Duration of Incarceration		
Less than 1 Year	16	22.5
2 – 5	32	45.1
6 – 10	17	23.9
More than 10	6	8.5

8.2 Descriptive Statistics

Section B of the study instrument investigated the extent of digital inclusion, reporting statistics on the magnitude of the challenges facing FIPs relating to technological inclusion. The scale comprised 1 = Never to 4 = always scale to examine the extent of digital inclusion. The third section investigated the barriers to digital adoption among FIPs employing a 5-Likert Scale (1 = strongly Disagree to 5 = Strongly Agree).

On the other hand, section four was interested in the impacts of digital inclusion challenges on FIP re-integration. The respondents revealed their experiences with Yes or No responses, showing how digital inclusion barriers impact them. The descriptive statistics results are shown in Table 2.

Most respondents revealed low digital inclusion among 67.6% (n = 48) FIPs. On the other hand, 32.4% (n = 23) reported a moderate level of inclusion, while none depicted high levels of digital inclusion, revealing high levels of digital exclusion among formerly incarcerated populations. Regarding the barriers FIPs face to technological access and adoption, 93% (n = 66) of FIPs overwhelmingly reported numerous barriers to digital adoption. On the

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Table 2: Frequencies for the extent of Digital Inclusion and Barriers to adoption among FIPs.

Descriptives	Frequency	Percent (%)
Digital Inclusion		
Low Inclusion	48	67.6
Moderate Inclusion	23	32.4
High Inclusion	0	0.0
Digital Adoption Barriers		
Low Barriers	0	0.0
Intermediate Barriers	5	7.0
High Barriers	66	93.0
Impacts of Digital Exclusion		
D1. Rearrests		
Yes	49	69.0
No	22	31.0
D2. Challenges in Job Searching		
Yes	51	71.8
No	20	28.2
D3. Difficulty In Accessing Services		
Yes	54	76.1
No	17	23.9
D4. Feelings of Anxiety and Depression		
Yes	54	76.1
No	17	23.9

8.3 Association Between Digital Barriers and Reintegration Behaviour

The analysis conducted a chi-square association test to investigate the relationship between digital inclusion barriers and FIPs' re-integration behaviours.

Chi-square is computed using:

$X^2 = \sum \left[\frac{(O-E)^2}{E}\right]$, where

$\sum = Summation\ sign$
O = Observation frequencies and
E = Expected frequencies

The re-integration behaviors considered the reported impacts of the low digital inclusion among FIPs. The chi-square test is computed and reported in Table 3 using SPSS software.

Table 3 displayed a Pearson Chi-Square p-value of 0.387, greater than the significance level of 0.05. The Chi-square result, therefore, rejected the null hypothesis, supporting the null hypothesis that there was a significant association between technological barriers and re-integration behaviors among FIPs.

Table 3: Chi-Square Tests.

	Value	df	Assymp Sig (2-sided)
Pearson Chi-Square	19.072^a	18	.000
Likelihood Ratio	20.991	18	.280
Linear-by-Linear Association	.070	1	.792
N of Valid Cases	71		

a. 24 cells (85.7%) have expected count less than 5. The minimum expected count is .14.

9 DISCUSSIONS

The participant composition comprised more males than females. This trend aligns with the evidence that historically, male incarceration rates have been higher than female incarcerations in America (Spjeldnes et al., 2014). Similarly, the participants comprised more Blacks, 56.5%, than Hispanics and Whites. According to the National Institute of Justice (n.d.), incarceration rates vary among races. These differences explain the witnessed separations in the study participant population.

The analysis found low digital inclusion rates among FIPs regarding descriptive statistics. According to Zivanai and Mahlangu (2022), the FIPs experience an increasing digital divide resulting from the continued digital evolutions of society. According to the study, FIPs undergo digital inequalities, including digital barriers such as little access to ICT, exacerbating the distinctive pain of modern imprisonment. Similarly, Järveläinen and Rantanen (2021) revealed a high prevalence of digital exclusion among FIPs, predisposing the individuals to multiple societal inequalities.

Concerning the barriers to digital access and adoption, the research identified multiple barriers to digital adoption. 93% of the study respondents overwhelmingly reported experiencing various challenges in accessing and adopting technology. Zivanai and Mahlangu (2022) consistently highlighted that FIPs have poor access to technologies. The current study established that a high frequency of FIPs faced inadequate financial resources to stay up to date with the evolving technologies. Annotatively, FIPs mainly comprise individuals facing different vulnerabilities, including ethnic minorities and poor income backgrounds (Reisdorf & DeCook, 2022). Financial constraints limit FIPs' ability to acquire modern digital equipment or seek digital training, which might not comprise their priority needs—another significant barrier is the lack of digital support for adoption. According to Purcell (2023), prisons are slow to adopt digital technologies for multiple reasons, including security concerns and inadequate gadgets. Correctional education during incarceration does not equip detained individuals with digital skills to ease their reintegration. Similarly, other FIPs, including those on parole, are restricted from accessing digital gadgets.

The impacts of the low access and slow adoption are gross among FIPs, contributing to immense challenges regarding reintegration into society. Firstly, the study highlighted that digital exclusion impacts recidivism rates. The high reported recidivism frequencies are attributed to the digital gap that FIPs experience, pushing them to crimes leading to re-arrest (Järveläinen & Rantanen, 2021).

Additionally, the study reported that formerly incarcerated have problems accessing vital digital services, including banking, telemedicine services, and online training. Their incompetence to utilize the internet and digital technologies limits their scope of potential employers, increasing unemployment rates among FIPs (Järveläinen & Rantanen, 2021).

From Table 3 above, the Person Chi-squre X^2 = 19.072, degree of freedom df = 18 and Asymptotic sig. value p = 0.000. Therefore, the Null hypothesis is rejected and we accept the alternative hypothesis.

10 RECOMMENDATIONS AND CONCLUSION

The study revealed that FIPs face multiple barriers to digital inclusion hindering technological access and adoption. However, the study found an insignificant association between the barriers to inclusion and the challenges FIPs face at integration. However, the analysis annotated that the finding might result from the study limitation of small sample size.

Nonetheless, the study recommended digital education inside and outside prisons for FIPs. The individuals should be allowed to attend a compulsory digital training services because education delivery can be cumbersome without the technology (Badejo & Chakraborty, 2022), courtesy of the reentry programs once their release date is close to a year. Also, stakeholders should increase access to technology devices and ensure affordability for formerly incarcerated individuals by collaborating with government agencies, community organizations, and technology companies.

Additional recommendations include promoting partnerships between educational institutions and correctional facilities to provide digital skills training to incarcerated individuals.

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