Examining Social Justice Implications of Proctoring Technologies in Online Assessments within Open and Distance e-Learning (ODeL) Environments: Privacy, Equity, and Access

Siyanda Cele[1], Mncedisi Christian Maphalala[2]*

[1] University of South Africa, ABET and Youth Development, University of South Africa

[2] Department of Curriculum & Instructional Studies, University of South Africa

*Corresponding Author: emaphamc@unisa.ac.za

ABSTRACT

The study explores the social justice implications of proctoring technologies in online assessments within Open and Distance e-learning (ODeL) environments, focusing on privacy, equity, and access. Through a systematic literature review (SLR) adhering to PRISMA protocols, the study analyses peer-reviewed empirical research published between 2014 and 2024. Key thematic areas identified include the ethical concerns surrounding privacy and surveillance, the impact of proctoring technologies on equitable access to assessments, and the potential biases embedded within automated monitoring systems. The study highlights the need for fair and transparent strategies for online proctoring in Open and Distance e-Learning (ODeL) environments. It is essential to balance maintaining academic integrity and respecting students' privacy and ethical concerns. Proctoring technologies should align with Social Justice Theory to safeguard students' rights to privacy, equal access, and active participation. Future studies should focus on developing policies and technologies that enhance fairness and trust while protecting students' rights during online assessments.

INTRODUCTION

The COVID-19 pandemic precipitated a rapid and unprecedented transition to online assessment in higher education, particularly within Open Distance and e-Learning (ODeL) institutions. Numerous scholars have highlighted the advantages of online assessments in such contexts, emphasising their capacity to facilitate large-scale assessment and eliminate the need for paperwork (Fynn & Mashile, 2022; Mphahlele, 2022). Studies underscore the ability of online assessments to enhance student engagement, motivation, and learning outcomes, while accommodating diverse learning styles (Patel et al., 2023; Mphahlele, 2024). Furthermore, online assessment enables continuous evaluation and promotes collaborative learning, offering significant benefits for managing large classes (Fynn & Mashile, 2022; Patel et al., 2023). Mwangi (2021) asserts that these practices expand access to higher education for underrepresented groups, such as women in marginalised areas. However, as Heil and Ifenthaler (2023) observe, the success of online assessment hinges on the establishment of clear criteria and the provision of instructional support.

Despite these advantages, online assessments in ODeL institutions are fraught with challenges. Researchers have documented issues such as connectivity problems, increased workloads for both students and lecturers and significant inequalities in device and internet access (Baloyi & Gezani, 2024; Fynn &

Mashile, 2022). These disparities were starkly evident during the pandemic, disproportionately affecting working students and those with caregiving responsibilities (Fynn & Mashile, 2022). Further complicating the landscape are concerns about exam security, digital incompetency, and insufficient technical support (Majola & Mudau, 2022). Violations of assessment integrity principles—including cheating, plagiarism, and impersonation—pose additional challenges (Al-Maqbali & Hussain, 2022). Scholars like Mphahlele (2024) and Lumadi (2023) advocate for enhanced digital literacy, innovative digital tools, and equity-focused strategies to address these systemic issues and improve assessment practices in online education.

Adopting online proctoring tools has become increasingly common as institutions seek to safeguard academic integrity during remote assessments (Gribbins & Bonk, 2023; Gudiño Paredes et al., 2021). Proctoring technologies provide several benefits, including maintaining exam integrity and adding value to degree programs (Duncan & Joyner, 2022). However, Khalil et al. (2022) note that these tools are often selected based on cost and usability rather than effectiveness in curbing academic dishonesty. While proctoring systems aim to deter malpractice, their implementation has raised significant concerns about student privacy, equity, and technical difficulties (Jacobs & Mncube, 2023). Students frequently report heightened anxiety and apprehension related to surveillance, underscoring the need for institutions to balance academic integrity with student well-being (Hussein et al., 2020; Selwyn et al., 2021).

Ethical and social justice considerations surrounding online proctoring tools have been widely debated. Coghlan et al. (2021) and Isbell et al. (2023) highlight that these systems often perpetuate racial and gender biases, disproportionately flagging students with darker skin tones for potential cheating. Critics, such as Lee and Fanguy (2022), argue that the widespread use of proctoring technologies fosters an environment of distrust and undermines educational outcomes. The alignment of these tools with broader educational goals remains questionable, particularly given their impact on marginalised groups (Archer, 2023; Parnther & Eaton, 2021). Selwyn et al. (2021) emphasise the urgent need for critical evaluation of proctoring technologies to ensure they align with principles of social justice and educational equity.

The digital divide remains a persistent barrier to equitable participation in online assessments, particularly for students from disadvantaged backgrounds. Research by Azionya and Nhedzi (2021) and Hartnett et al. (2023) reveals that limited access to devices and reliable internet significantly hinders synchronous learning and assessment. These barriers are further compounded by inadequate digital skills and reliance on smartphones for online learning (Banerjee, 2022). Rural students face additional obstacles, including unconducive learning environments and scarce resources (Maniram, 2023). Scholars such as Faloye and Ajayi (2021) have noted that the pandemic exacerbated these pre-existing inequalities, underscoring the need for targeted interventions to bridge the digital divide.

The transition to continuous online assessment has brought additional challenges, particularly for students balancing work and household responsibilities. Studies reveal that these groups face disproportionately higher workloads and limited support, amplifying existing inequities (Fynn & Mashile, 2022). Institutions must prioritise addressing these challenges to create a more inclusive educational environment. Scholars advocate for policies and practices that mitigate digital inequalities, such as providing affordable internet access, devices, and technical support (Woldegiorgis, 2022; Iftikhar et al., 2023). By fostering digital equity, higher education institutions can better support vulnerable students and reduce the epistemic gaps that threaten inclusive education.

While online assessments in ODeL institutions offer numerous pedagogical and logistical advantages, they are accompanied by significant challenges that require urgent attention. The literature consistently emphasises the importance of addressing digital inequities, enhancing digital literacy, and critically evaluating the ethical implications of online proctoring tools. Researchers like Mwangi (2021) and Mphahlele (2024) suggest that future efforts must leverage innovative technologies to create equitable and effective

assessment practices. Ensuring inclusivity and fairness in online education remains critical for advancing higher education in the digital age.

THEORETICAL FRAMEWORK

Social Justice Theory

Social Justice Theory is a foundational framework for addressing societal inequalities by promoting equality, recognising individual worth, and fostering meaningful participation, particularly among marginalised groups (Prihartono et al., 2023). Originating from ancient Greek philosophy and evolving through contemporary thought, the theory encompasses diverse concerns, including land distribution, housing, and economic policy reforms (Prihartono et al., 2023). Scholars like Ulriksen and Plagerson (2021) have characterised the theory as instrumental, emancipatory, incomplete, paradox-sensitive, and relational, reflecting its adaptability to complex social realities. While closely associated with conflict and critical theory, as Campbell (2021) observes, Social Justice Theory is not confined to these frameworks; alternative theoretical approaches may also contribute to achieving moral objectives. In professional fields such as nursing, Walter (2016) advances the concept of Emancipatory Nursing Praxis, which builds on Social Justice Theory to emphasise transformative learning processes and the development of advocacy and allyship roles. This approach underscores the necessity of educational and organisational support to enable professionals to assume socially just roles in their practice.

In higher education, recent scholarship has underscored the urgent need to integrate social justice principles into research practices, pedagogical approaches, and institutional policies to address systemic inequalities and empower diverse student populations (McArthur & Ashwin, 2020). Participatory action research has emerged as a promising method to promote socially just pedagogy by involving students in collaborative course design processes, thereby fostering inclusivity and equity (Aktaş, 2021). As Patterson (2021) argues, institutions are increasingly challenged to redefine their roles through a social justice lens, addressing racism and inequities entrenched in their systems. In post-apartheid South Africa, advancing social justice requires decolonising curricula and embracing diverse epistemologies to address historical injustices and create inclusive educational environments (Ntshoe, 2020). Collectively, these studies advocate for embedding social justice principles across educational practices and institutional frameworks, enabling higher education systems to serve as catalysts for societal transformation and equity.

Social Justice Theory serves as a critical theoretical lens in this paper to address systemic inequalities perpetuated by proctoring technologies in online assessments within open and distance e-learning (ODeL) environments. Rooted in principles of equality, individual dignity, and meaningful participation, the theory emphasises the need to consider the implications of proctoring tools on marginalised groups, such as those disadvantaged by racial, economic, or geographic disparities, mainly Black African and rural poor students (Prihartono et al., 2023). Its adaptability to complex social realities, as characterised by Ulriksen and Plagerson (2021), makes it an essential framework for critiquing how these technologies may reinforce existing inequities or introduce new ones in ODeL environments. By advocating for policies and practices that align with principles of inclusivity and equity, the theory underscores the importance of addressing privacy concerns, bridging digital divides, and ensuring fair access to assessment opportunities. This lens also aligns with broader efforts to decolonise education and embrace diverse epistemologies in post-apartheid South Africa, fostering transformation and equity in higher education systems (Ntshoe, 2020). Thus, Social Justice Theory informs the ethical critique of proctoring technologies and guides the pursuit of socially just educational practices.

METHODS

This research utilises a systematic literature review (SLR) approach, recognised for its thoroughness in identifying, evaluating, and consolidating relevant research findings (Kitchenham, 2004; Okoli & Schabram, 2010). The SLR methodology ensures a comprehensive topic exploration, adhering to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al., 2009). The primary objectives of this review are:

- To identify, categorise, and summarise existing studies on the social justice implications of proctoring technologies in open and distance e-learning (ODeL) settings.
- To highlight gaps and potential areas for future research concerning privacy, equity, and access.

This study addresses the following research questions:

- What privacy concerns are associated with proctoring technologies in online assessments within ODeL environments?
- How do these technologies impact equity among diverse student groups?
- What access challenges are linked to implementing proctoring technologies in online assessments?

The search strategy involved a systematic search to identify peer-reviewed empirical studies published between January 2014 and December 2024. The following electronic databases were utilised: Scopus, Web of Science, IEEE Xplore, PubMed (for related psychological and behavioural studies), and ERIC (Education Resources Information Center). Additionally, using snowballing techniques, Google Scholar was employed for backward and forward citation analysis. The searches were refined through keywords and Boolean operators, resulting in search strings that combined terms such as: "proctoring technologies" AND "online assessments" AND "privacy"; "equity" OR "fairness" AND "distance learning"; "access barriers" AND "proctoring" AND "social justice implications." The initial search produced 1,200 articles. After removing duplicates, 789 unique articles were evaluated based on their titles and abstracts. From this group, 86 articles were selected for full-text review based on their relevance to the inclusion criteria. To ensure both relevance and specificity, the following criteria were applied:

Inclusion criteria included:

- Empirical studies examining proctoring technologies in ODeL.
- Research focusing on privacy, equity, or access implications.
- Studies published in English between 2014 and 2024.
- Peer-reviewed journal articles, conference proceedings, or reports from reputable organisations.
    Exclusion criteria included:
- Studies unrelated to ODeL or online assessments.
- Opinion pieces, editorials, and non-empirical studies.
- Articles concentrating solely on technical aspects of proctoring software without consideration for social justice.

The study selection process involved these steps:

1. Initial Search: Database results were imported into EndNote for citation management. Duplicates were removed before further evaluation.
2. Screening Titles and Abstracts: Two independent reviewers assessed titles and abstracts against the inclusion and exclusion criteria. A random sample was checked to ensure consistency.
3. Full-Text Review: The full texts of qualified studies were evaluated to confirm inclusion. Any discrepancies between reviewers were resolved through discussion and consensus.
4. PRISMA Flowchart: A PRISMA flow diagram illustrates the study selection process (Figure 1).

Prisma Flow Diagram for Systematic Literature Review

Records Identified through database searches
(n= 1,200)

↓

Duplicates removed
(n= 411)

↓

Abstracts screened
(n= 789)

↓

Full-text articles assessed
(n= 112)

↓

Studies included in review
(n= 86)

Thematic analysis identified the recurring themes:
- Ethical Concerns Surrounding Privacy and Surveillance
- Inequity in Access to Technology
- Cultural Sensitivity and Bias in Proctoring Algorithms
- Ethical and Legal Concerns Over Data Security
- Student Trust and Engagement with Proctoring Technologies
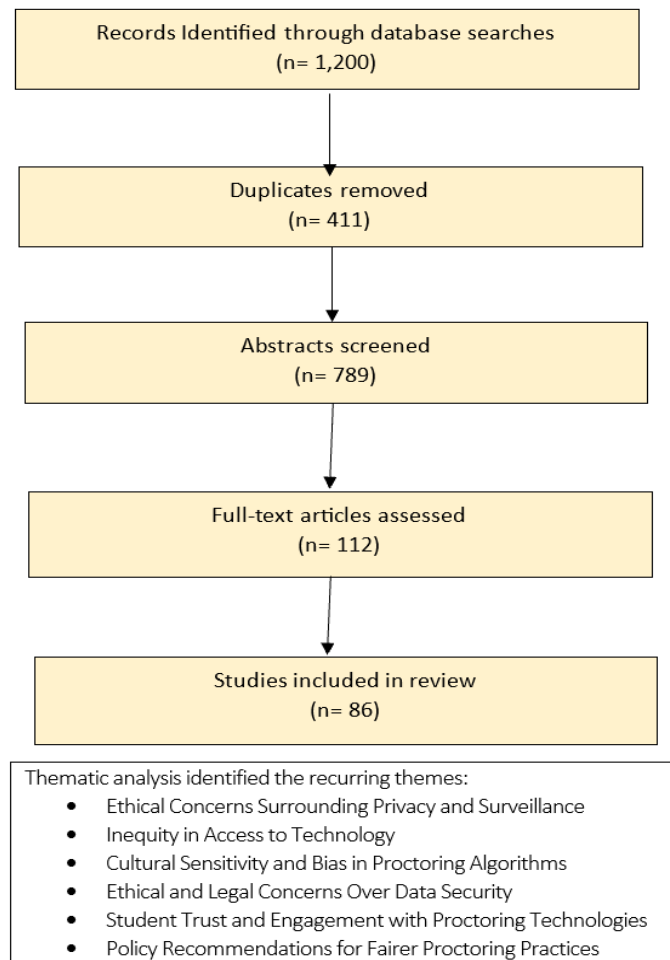- Policy Recommendations for Fairer Proctoring Practices

Figure 1: Prisma Flow Diagram for Systematic Literature Review

A structured data extraction sheet was used to gather information on study objectives and research questions; methodology (qualitative, quantitative, or mixed methods); sample characteristics (size, demographics, and context); key findings regarding privacy, equity, and access; study limitations; and areas for further research.

To ensure the robustness of the included studies, a quality assessment checklist based on established criteria (e.g., CASP—Critical Appraisal Skills Programme) was employed. Studies were evaluated based on criteria such as the clarity of objectives, rigour of methodology, validity of findings, and relevance to the research questions.

The extracted data were synthesised using thematic analysis to identify consistent patterns and insights related to privacy, equity, and access. A narrative synthesis approach was also applied to integrate findings across studies and provide a comprehensive understanding of the social justice implications of proctoring technologies. Despite efforts to ensure completeness, potential limitations of the review include the restriction to studies published in English, which may overlook significant research in other languages, and the evolving nature of the field, with newer studies potentially emerging after the conclusion of this review.

FINDINGS

The study identified six key thematic areas regarding the social justice implications of proctoring technologies in online assessments within Open and Distance e-learning (ODeL) environments. These themes reflect the challenges and opportunities related to privacy, equity, and bias in proctoring systems, and each highlights crucial aspects of social justice concerns in the context of online education.

Theme 1: Concerns Surrounding Privacy and Surveillance

Proctoring technologies, particularly those relying on AI and live surveillance, raise significant privacy and ethical concerns. Many students expressed anxiety over the surveillance nature of these tools, with some viewing them as an invasion of privacy (Binns, 2018; Burgess & Hodge, 2020). The collection of personal data, including video footage, biometric data, and keystrokes, has raised alarms regarding the potential misuse or breach of sensitive information (McGrath, 2020). Students reported feeling uncomfortable with the constant monitoring, which often leads to heightened stress and may detract from their overall learning experience (Bryson et al., 2020). As surveillance practices increase, so too does the need for clear guidelines on data handling, transparency, and consent, ensuring that students' rights are respected (Siddiqui, 2020).

The increasing reliance on proctoring technologies for online assessments has led to significant challenges, particularly concerning privacy and surveillance. These technologies employ advanced tools such as artificial intelligence (AI), live monitoring via webcams, and screen-tracking capabilities to uphold academic integrity. While effective in deterring cheating, the extensive monitoring raises critical ethical and social justice issues, particularly in Open and Distance e-learning (ODeL) environments.

Proctoring systems typically require students to activate their webcams and microphones during exams, which can unintentionally record their personal surroundings. This intrusion exposes students' private spaces and is often perceived as invasive. The discomfort stemming from such monitoring detracts from the testing experience for many students, who view it as violating their privacy (Binns, 2018; Burgess & Hodge, 2020). Furthermore, proctoring software collects and retains sensitive data, including video recordings, biometric information, and keystrokes, usually for extended periods. The lack of clear regulations regarding data ownership, access rights, and retention periods exacerbates concerns about this information's potential misuse or breach (McGrath, 2020; Siddiqui, 2020). Students remain uncertain about how their data might be used or shared, which worsens trust issues with educational institutions.

The constant surveillance inherent in proctoring technologies can heighten stress and anxiety levels, negatively impacting student performance. This atmosphere of ongoing observation creates a sense of distrust between students and institutions, turning the assessment process into something more intimidating than supportive (Bryson et al., 2020). Live proctoring involves real-time oversight of students through their webcams, microphones, and screen activities by human proctors. While effective in detecting potential academic dishonesty, this method poses significant ethical dilemmas. Students may feel excessively monitored, leading to discomfort and anxiety (Gordon O'Reilly & Creagh, 2016). Automated proctoring, on the other hand, uses AI algorithms to analyse students' behaviours, flagging suspicious actions for further review. While efficient, these systems often lack transparency, leaving students unclear about how their actions are being evaluated. The absence of human oversight in the initial flagging process can lead to errors and raise ethical concerns regarding fairness and accountability (Yousef Atoum et al., 2017; Coghlan et al., 2021).

Proctoring software employs complex methods to verify students' identities, such as logging IP addresses, analysing keystroke patterns, and using biometric verification techniques. Many platforms also require students to present official identification cards, which are often matched with their facial features through AI-based recognition technology (Examity, 2020; Coghlan et al., 2021). Although these precautions

enhance exam security, they also introduce risks, including potential identity theft and the misuse of biometric information.

To facilitate monitoring, students must frequently install browser extensions or standalone software that grants proctoring systems access to their devices, including control over microphones, cameras, and screen-capture functions. Such intrusive measures increase privacy concerns and leave students feeling vulnerable to surveillance beyond educational purposes (Norman, 2020). To address these challenges, institutions should consider implementing the following strategies:

1) Limit the duration of data retention and ensure strong encryptions for all collected data.
2) Develop transparent guidelines specifying how data is used, stored, and shared while obtaining informed consent from students.
3) Explore alternative assessment methods that reduce reliance on intrusive surveillance technologies while maintaining academic integrity.

Therefore, universities must promote a fairer and more ethical assessment environment, balancing the need for exam security with the responsibility to respect students' privacy and dignity.

Theme 2: Inequity in Access to Technology

The impact of proctoring technologies is particularly pronounced for marginalised student groups who lack access to essential resources such as reliable internet connections, webcams, and quiet spaces. Research has shown that students from low-income backgrounds or rural areas often face significant barriers that hinder their participation in online assessments due to these technological disparities (Graham & Conner, 2020). This limited access can lead to substantial differences in performance, as students without adequate resources may struggle to meet the technical requirements of online proctored exams (Diaz et al., 2021). Moreover, the pressure of taking exams under these challenging conditions can intensify feelings of injustice, as disadvantaged students may perceive themselves as being treated unfairly due to circumstances beyond their control (Timmons & Phelps, 2022). The use of proctoring technologies in online assessments within Open and Distance e-Learning (ODeL) environments has exposed major inequalities in technology access. These disparities are especially severe among marginalised student populations, who often lack the necessary tools to fulfil the technological demands of online proctoring. Students from lower socio-economic backgrounds or rural locations frequently struggle to find dependable internet connections, webcams, and suitable environments for taking proctored exams. This issue is well-documented, with Graham and Conner (2020) highlighting the barriers to participation in online assessments created by these inequalities. These technological challenges often correlate with lower performance outcomes, as students without sufficient resources find it difficult to meet the requirements of online exams (Diaz et al., 2021).

Additionally, the stress of overcoming these challenges can amplify feelings of unfairness among disadvantaged students, who often believe they are being penalized for factors outside their control (Timmons & Phelps, 2022). These added pressures exacerbate existing disparities, disproportionately affecting students of color, those from low-income households, and learners in remote areas, as noted by Woldeab et al. (2017). Many proctoring technologies introduce further challenges through strict technical requirements. Proprietary software, mandatory external webcams, and the need for high-speed internet impose financial and logistical burdens on students (Dimeo, 2017). Such requirements can be particularly difficult for older learners or those less familiar with advanced technology, potentially excluding a significant segment of ODeL students from equitable participation in assessments.

AI-based proctoring systems have also been found to demonstrate biases in monitoring behaviours and appearances, which can lead to unequal treatment among different demographic groups. These systems may flag students based on background noise, lighting conditions, or even physical characteristics, disproportionately affecting marginalized populations (Selwyn et al., 2021). Additionally, the surveillance aspect of these systems raises privacy concerns, especially for students taking exams in shared or home

environments (Swager, 2020). Some institutions have attempted to address these inequities by offering device loans or allowing students to take exams on campus or at alternative locations. However, these initiatives often face logistical challenges, including delays in course progression or graduation timelines for students requiring accommodations (Coghlan et al., 2021).

In light of these findings, to promote equity and social justice, it is recommended that proctoring technologies adopt minimal technical requirements to ensure accessibility for all students, regardless of their socio-economic or geographical situations. Institutions should prioritise inclusive technologies that are compatible with standard hardware and software. Additionally, universities ought to establish comprehensive support systems, including device loan programs and infrastructure assistance, to help bridge the digital divide. Exploring alternative assessment methods, such as reflective essays, oral examinations, or project-based evaluations, can provide fair solutions while minimizing the need for intrusive proctoring technologies.

Theme 3: Ethical and Legal Concerns Over Data Security

Proctoring raises ethical and legal concerns related to surveillance and privacy invasion. Educational institutions must establish clear policies and guidelines that respect students' rights while maintaining the integrity of the assessment process. The collection of extensive personal data during proctored evaluations, including biometric details, poses risks to data security and the potential for breaches. Institutions implementing proctoring technologies must comply with legal frameworks such as GDPR or FERPA, which govern data protection in educational settings (Sweeney & Cuthbert, 2020). Additionally, transparency about how this data is handled, stored, and shared is crucial, as many students are unaware of the dangers associated with online surveillance (McGrath, 2020). Legal experts emphasise the need for stronger policies to protect students' personal data and to prevent surveillance methods from infringing on privacy rights (Greenwood, 2021).

This systematic review highlights the significant ethical and legal implications linked to the use of proctoring technologies in online assessments, particularly within Open and Distance e-learning (ODeL) environments. The primary concerns involve surveillance, privacy invasion, data security, and the potential breaches of legal and ethical standards. Online proctoring often employs intrusive monitoring techniques, such as recording students' facial expressions, body movements, and surroundings during exams. This constant surveillance can create a sense of mistrust and negatively impact students' psychological well-being (McGrath, 2020; Coghlan et al., 2021). These methods present ethical dilemmas regarding maintaining exam integrity and respecting students' rights.

AI-based proctoring systems can demonstrate biases that disproportionately affect certain groups. For instance, students with disabilities, non-native speakers, or individuals from diverse cultural backgrounds may be flagged for behaviours unrelated to academic dishonesty, such as nervous gestures or language differences (Coghlan, Miller, & Paterson, 2021). This inadvertent bias raises concerns about equity and inclusivity. The awareness of being constantly observed can increase anxiety among students, which may adversely affect their performance. This pressure is particularly harmful during high-stakes evaluations, where fairness and equity should be prioritised (Sweeney & Cuthbert, 2020; McGrath, 2020).

Proctoring software collects extensive personal information, including sensitive biometric data, which raises the risk of data breaches and misuse. Educational institutions must comply with strict data protection laws, such as the General Data Protection Regulation (GDPR) and the Family Educational Rights and Privacy Act (FERPA) (Greenwood, 2021; Mettl, 2018). These legal regulations mandate that data collection be limited, based on consent, and conducted transparently to protect privacy rights. However, the requirement for free and informed consent for data collection is often compromised due to the inherent power imbalance between students and universities. Students may feel pressured to consent to invasive data practices to participate in exams, contravening GDPR standards (Recitals 42 and 43 of GDPR).

Automated proctoring must also adhere to proportionality criteria, ensuring that data collection efforts are not excessive compared to the objective of maintaining assessment integrity. Less intrusive alternatives, such as open-book exams or non-automated video monitoring, could help alleviate these ethical and legal concerns (Amsterdam District Court, 2020). Additionally, proctoring software often requires installation on personal devices, introducing further IT security vulnerabilities. Unauthorised access to sensitive personal and institutional information can threaten both student privacy and the credibility of the institution (Art 5(1)(f), GDPR).

To address these issues, institutions can implement ethical and legally compliant practices:

1. Limit data collection to only essential elements, such as screen activity during tests, and avoid excessive recordings, like audio or environmental data, unless necessary.
2. Clearly explain what data is collected, how it will be used, and how long it will be stored. Institutions should inform students of their rights concerning their data.
3. Encourage less invasive methods such as open-book exams, take-home assignments, or project-based assessments to reduce reliance on proctoring technologies.
4. Provide students with the option to choose alternative monitoring methods or assessment formats.

These findings highlight the urgent need for ethical frameworks and robust legal guidelines to regulate proctoring technologies, ensuring they meet educational objectives while respecting students' rights and addressing issues of inequality.

Theme 4: Student Trust and Engagement with Proctoring Technologies

Proctoring technologies significantly impact students' trust in online assessments and their engagement in learning. Trust is crucial to the relationship between students and institutions, but it often diminishes when proctoring systems are perceived as intrusive or unfair. This erosion of trust can result in reduced academic engagement and adverse psychological effects. Research indicates that students who feel closely monitored are less likely to fully participate in the learning process, which may lead to lower academic performance (Bryson et al., 2020). The sensation of being constantly watched can increase anxiety and diminish students' sense of autonomy, ultimately affecting their ability to perform at their best (Timmons & Phelps, 2022). Confidence in both the technology and the institution is vital for student engagement, and when proctoring processes are seen as invasive or unjust, students' academic experiences are negatively impacted (Graham & Conner, 2020).

Students often express feelings of being surveyed during online assessments, which undermines their trust in the fairness of the evaluation process. Bryson et al. (2020) found that the perception of monitoring systems reduces students' sense of autonomy, leading to increased stress and anxiety. Timmons and Phelps (2022) support this, noting that such negative feelings can hinder students' academic performance and overall involvement. A lack of transparent information about how proctoring technologies operate—such as who reviews the footage and the circumstances under which it is evaluated—intensifies this distrust (Gallagher et al., 2021).

Proctoring technologies can heighten awareness and anxiety about the risk of being unjustly accused of misconduct. For example, unclear alerts or punitive actions based on innocuous behaviours, like shifting in one's seat or sneezing, can generate anxiety and frustration. Such experiences indicate a breakdown of trust among students, instructors, and institutions (Rambe & Nel, 2015; Smith, 2020). This psychological burden mainly affects students with pre-existing conditions like anxiety, further exacerbating disparities in equity (Chen et al., 2015). As Aagaard (2017) notes, students often feel ambivalent about proctoring technologies; they recognise their role in upholding academic integrity but criticise their intrusive nature. Many students feel disenfranchised, viewing these systems as institutional mandates with few opportunities for negotiation or alternatives (Riley et al., 2014). The rigidity of proctoring systems and insufficient channels for addressing students' concerns diminishes their sense of agency and engagement (Johri, 2022).

Proctoring systems can distract students from genuine learning, shifting their focus to merely passing assessments while being monitored. As Fisher (2019) highlights, this disconnect detracts from authentic learning and promotes a transactional view of education. Furthermore, students argue that reliance on technology for monitoring often reflects poorly designed assessments prioritising memorization over critical thinking and application (Riley et al., 2014).

Recommendations for cultivating trust and engagement involve the following:

1. To build trust and enhance student involvement, institutions should adopt transparent, fair, and student-centred strategies for proctoring:
2. Clarity: Provide clear guidelines regarding the operation of proctoring systems, including policies around data usage and assessment criteria (Barria-Pineda, 2020; Klein et al., 2019).
3. Involvement: Students should be involved in the decision-making process related to the selection and implementation of proctoring systems (Gallagher et al., 2021).
4. Instructor Preparation: Equip academics with the skills to evaluate technology's ethical implications and create assessments that prioritise fairness and inclusivity (Campbell, 2008; Hansen, 1998).
5. Fairness: Address the disproportionate impact of proctoring technologies on marginalised and vulnerable student populations through tailored interventions and support strategies (Ifenthaler & Tracey, 2016).

Proctoring technologies in online assessments pose significant challenges to creating an equitable and engaging educational environment. Addressing these challenges requires systemic changes to rebuild trust, prioritise student well-being, and ensure that technology facilitates learning rather than a barrier.

Theme 5: Recommendations for Fairer Proctoring Practices

This systematic review highlights the significant implications for social justice related to the use of proctoring technologies in online assessments within Open and Distance e-Learning (ODeL) settings. The findings lead to several recommendations under the heading "Recommendations for Fairer Proctoring Practices" aimed at addressing concerns regarding privacy, equity, and accessibility. Universities should prioritize clear communication about how proctoring technologies collect, use, and store data. Implementing transparent policies can establish trust and ensure that students are informed about the consequences of using these technologies (Eubanks, 2018). To safeguard privacy, it is crucial to enforce measures such as data anonymization, encrypted communications, and limitations on data retention to prevent the misuse of personal information (Bennett & Maton, 2015). To promote equity, institutions must ensure that proctoring technologies are available to students with disabilities, those in rural or economically disadvantaged areas, and other marginalized groups.

Accessibility measures should include support for low-bandwidth situations and compatibility with assistive technologies (Rambe & Nel, 2015). Additionally, providing financial assistance or subsidized hardware and software for students facing financial hardships can help overcome access barriers. Proctoring algorithms require ongoing monitoring and evaluation to identify and eliminate biases that may unfairly label certain student demographics, such as individuals with darker skin tones or distinct cultural behaviors, as suspicious (Kumar & Singh, 2021). To reduce bias, it is essential to develop algorithms using diverse and representative datasets (Smith, 2020).

To address equity and privacy concerns associated with traditional proctoring methods, educational institutions can implement alternative assessment strategies that minimize invasive monitoring:

1. Open-book Exams: These assessments focus on application and critical thinking rather than rote memorization, which lessens the need for oversight and enhances learning outcomes (Riley, Soloway, & Brewer, 2014).

2. Project-based Assessments: Evaluating students through research projects, presentations, or collaborative work allows for the assessment of a wide range of skills, including creativity, teamwork, and problem-solving (Gallagher et al., 2021).

3. Remote Oral Exams: These evaluations encourage direct interaction between the student and the examiner, reducing reliance on algorithmic monitoring while maintaining academic integrity (Kearnes & Wynne, 2007).

4. Honor Codes: By cultivating a culture of academic integrity, schools can encourage students to adhere to principles of honesty and fairness, thereby diminishing the need for intrusive proctoring methods (Hansen, 1998).

Universities and policymakers should engage in ongoing research to understand the long-term effects of proctoring technologies on student well-being and equity (Ifenthaler & Tracey, 2016). Policies should be adaptable, addressing emerging challenges while ensuring that inclusivity, fairness, and respect for students' rights remain central to assessment practices (Bryson, Hand, & Jones, 2020).

These findings emphasize the necessity for actionable reforms that align proctoring practices with the principles of social justice, equity, and respect for individual rights.

DISCUSSION

This systematic review addresses significant social justice concerns associated with proctoring technologies in online assessments within Open and Distance e-Learning (ODeL) settings. The findings reveal critical issues related to privacy, equity, data security, and student trust, all of which relate to broader social justice and fairness themes. This discussion analyses these topics through the lens of Social Justice Theory, which advocates for fairness, equal access, and the protection of individual rights in educational contexts.

The privacy dilemmas associated with proctoring technologies, particularly those that utilise AI and live surveillance, highlight serious ethical challenges. Many students express discomfort with the intrusive nature of continuous monitoring, which includes collecting biometric data, video recordings, and keystroke information (Binns, 2018; Burgess & Hodge, 2020). The potential for data breaches and misuse raises significant concerns about the safety of personal information in today's digital landscape (McGrath, 2020). From a social justice perspective, these issues emphasise the importance of privacy rights, which are fundamental to human dignity and equality (Siddiqui, 2020). Social Justice Theory underscores that the right to privacy is crucial for individuals to feel respected and empowered, particularly for marginalised groups who may be disproportionately affected by surveillance methods (Prihartono et al., 2023). Therefore, educational institutions must implement transparent and ethical practices prioritising student consent and data protection to ensure privacy concerns do not compromise students' rights to a fair and just learning environment.

The second theme focuses on disparities in access to technology, a critical issue in ODeL environments where differences in technological availability can exacerbate existing social and educational inequalities. Research indicates that students from low-income and rural backgrounds face significant obstacles, as they may lack access to essential resources such as high-speed internet, webcams, or quiet study environments necessary for participating in online assessments (Graham & Conner, 2020; Diaz et al., 2021). This inequity directly contradicts the principles of social justice, which advocate for equal access to opportunities for all individuals, regardless of their socioeconomic status or geographic location (McArthur & Ashwin, 2020). Addressing these disparities is essential to ensure that proctoring technologies do not reinforce exclusionary practices in educational settings. Educational institutions must develop support systems to provide access to technology and ensure stable internet connectivity, creating equitable and accessible assessments for all students.

Proctoring tools present complex ethical and legal challenges related to data security, as they require personal data collection that must be handled with care. According to Sweeney and Cuthbert (2020) and McGrath (2020), legal frameworks such as GDPR and FERPA are essential for protecting students' data rights and ensuring institutions comply with stringent security standards. The principles of Social Justice Theory advocate for responsibility and fairness in collecting, storing, and sharing personal information. The regulations governing the legal and ethical use of proctoring technologies must be robust enough to protect students from potential exploitation or privacy breaches. Such protections are vital for fostering an educational environment where students can trust that their personal data is managed responsibly and ethically, thereby reinforcing their dignity and rights as individuals (Campbell, 2021).

Student trust in proctoring technologies is essential for encouraging active participation in online assessments. Studies show that when students perceive proctoring as invasive or unfair, their confidence in the system declines, leading to disengagement and anxiety that negatively impacts their academic performance (Bryson et al., 2020; Timmons & Phelps, 2022). This issue is particularly significant within the context of Social Justice Theory, which emphasises equitable treatment and the protection of students' autonomy. Proctoring practices must be transparent, inclusive, and fair to build trust and encourage involvement. Students should be included in the decision-making processes regarding implementing proctoring technologies (Gallagher et al., 2021), and institutions must ensure that assessments are designed to be equitable, accessible, and free from bias (Ifenthaler & Tracey, 2016). Additionally, institutions should clearly communicate the goals and procedures of proctoring to ensure that students are fully informed and comfortable with the process. Implementing these strategies can help reduce feelings of unfairness and foster a more equitable and trusting educational environment.

The findings highlight several key strategies for addressing the social justice implications of proctoring technologies. First and foremost, transparency and informed consent are vital. Institutions should provide clear and understandable information regarding how proctoring works, what data is collected, and the protections for that data. Informed consent must be obtained from students before utilising any proctoring technology, ensuring they know the potential risks and benefits (Barria-Pineda, 2020; Klein et al., 2019). Furthermore, to address issues of inequality, institutions should establish policies that support students from underrepresented backgrounds by providing necessary technological support and accommodations (Graham & Conner, 2020). Proctoring systems should prioritise fairness by eliminating biases that could disadvantage certain groups of students (Ifenthaler & Tracey, 2016).

Social Justice Theory serves as a vital framework for examining the insights of this review. The theory focuses on equality, fairness, and the protection of individual rights; it highlights the need for proctoring technologies to be implemented in ways that promote equitable educational opportunities rather than hindering them. Incorporating social justice principles into proctoring practices can help mitigate the disproportionate effects of surveillance and technological inequities on marginalised students, ensuring their privacy and autonomy are respected. This perspective aligns with contemporary scholarship advocating for integrating social justice values within educational systems, where inclusivity and fairness are paramount (McArthur & Ashwin, 2020; Aktaş, 2021).

The conclusions drawn from this review emphasise the necessity for a more nuanced and equitable approach to online proctoring in Open and Distance e-Learning (ODeL) environments. While proctoring technologies are important for upholding academic integrity, they also pose significant privacy, equity, and ethical challenges that must be addressed through transparent, inclusive, and fair practices. By incorporating the principles of Social Justice Theory into proctoring methods, educational institutions can ensure that these practices honour students' rights to privacy, fair access, and meaningful participation, ultimately fostering a more just and inclusive educational system. Future studies should further explore these issues, focusing on

developing policies and technologies that balance the need for academic integrity with the imperative to protect student rights and build confidence in online assessments.

IMPLICATIONS FOR FUTURE PRACTICE

The study offers insights for future practices in online education and assessment. As proctoring technologies become increasingly common in ODeL settings, academics, institutions, and policymakers need to understand the broader social justice implications. This study indicates that while these technologies aim to uphold academic integrity, they can inadvertently reinforce existing inequalities and marginalise certain groups, particularly concerning privacy, accessibility, and equity. The findings highlight the need for a more thoughtful approach to implementing proctoring technologies. Future practices should prioritize the development of ethical frameworks that protect student privacy while maintaining the integrity of assessments. Universities should explore alternatives to traditional proctoring methods by utilising accessible and inclusive technologies that address the diverse needs of all students, including those with disabilities and individuals from economically disadvantaged backgrounds. Additionally, transparent communication with students about using proctoring technologies is crucial, ensuring they are informed and consent to the terms and conditions.

Furthermore, ongoing research is needed to understand how proctoring technologies impact student performance, engagement, and stress levels, especially among different demographic groups in ODeL environments. Incorporating social justice principles into the design and implementation of online assessments is essential for fostering equitable learning spaces. Academics and administrators must ensure that technology is effective from a technical standpoint and socially responsible, promoting fairness and inclusivity. Therefore, future practices should aim to balance the need for academic integrity with the social justice implications of technology usage, fostering a more equitable and accessible ODeL environment for all learners. Achieving this goal will require continuous reflection, adaptation, and a commitment to bridging the digital divide, ensuring that online learning environments are just and inclusive for every student.

CONCLUSION

The study highlights the complex social justice issues related to proctoring technologies in online assessments, particularly in Open and Distance e-learning (ODeL) settings. While these technologies are designed to uphold academic integrity, they raise significant concerns regarding privacy, equity, and accessibility, especially for marginalised and disadvantaged student populations. The findings highlight the need for a careful and ethically driven approach when implementing proctoring technologies to ensure they do not exacerbate existing inequalities. Future practices should focus on inclusive, transparent, and accessible methods that safeguard student rights while maintaining the integrity of evaluations. Ultimately, the research calls for ongoing dialogue, further investigation, and policy development to create equitable learning environments where every student can succeed.

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