



Disparities in open educational resources: promoting equity in online learning for higher education

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Abstract

This study focuses on the role that higher education institutions play in addressing these disparities, with the aim of improving academic achievement and reducing educational inequities among under-represented students. The guiding question for this study is: how can higher education institutions leverage Open Educational Resources (OERs) to ensure equitable access and usage among diverse student populations, thereby narrowing the achievement gap in online learning? This study adopted a qualitative approach, employing semi-structured interviews as the primary data collection instrument with 24 participants. The study was based on social cognitive theory to explore how OER accessibility and institutional support affect student performance in online learning environments. The results indicate that differences in technology resources, skills, and the ability of institutions to support OER use can lead to unequal learning results, less student involvement, and ongoing academic inequalities. This study reveals that fostering equitable access to OERs, coupled with targeted institutional interventions, has a powerful impact on improving academic performance and promoting inclusivity in higher education. The study has recommended that higher education institutions should invest in robust digital infrastructure to ensure equitable access to OERs for all students, particularly those from under-represented and disadvantaged backgrounds.

Keywords: Access, digital infrastructure, Equity, online learning, Open educational resources

Introduction

Open Educational Resources have become vital in advancing equity within higher education by offering free, accessible, and adaptable learning materials. Tlili et al. (2023) define OERs as teaching, learning, and research materials that reside in the public domain or are released under open licenses, enabling no-cost access, use, adaptation, and redistribution. These resources have the potential to break down financial, geographical, and institutional barriers that hinder educational access. However, despite this promise, disparities in OER access, usage, and integration continue to exist, particularly in online learning contexts. The COVID-19 pandemic further magnified these disparities, as students from disadvantaged backgrounds struggled with limited access to technology and the internet (Czerniewicz et al., 2020).

The successful adoption and integration of OERs are closely linked to digital infrastructure, institutional support, and technological literacy. As highlighted by Hodgkinson-Williams and Arinto (2017), under-resourced institutions often lack the funding, faculty training, and technological tools necessary for effective OER implementation. Similarly, Haleem et al. (2022) emphasize that the use of OERs requires both access and the capacity to critically engage with the materials. These challenges are compounded by the absence of clear policy frameworks in many institutions. Wiley and Hilton (2018) argue that supportive policies are critical for fostering innovation and ensuring consistent access to OERs across diverse learning environments.

In addition to infrastructural and policy concerns, the cultural and contextual relevance of OERs remains a significant issue. Croft and Brown (2020) point out that many OERs originate from high-income countries and may not align with the needs of learners in low- and middle-income regions. Efforts to localize content are essential to ensure its effectiveness and engagement across diverse populations. Encouragingly, initiatives like those led by

the Open Education Consortium are helping bridge these gaps by training educators in developing countries to create and share high-quality, contextually appropriate OERs (Jung & Lee, 2022). Furthermore, studies show that access to OERs can positively impact academic performance (Hilton, 2020), but equitable implementation is crucial if these benefits are to be realized by all students. Institutions must commit to inclusive strategies that include investment, training, and collaboration to narrow the achievement gap and promote meaningful educational equity (Zaid & Alabi, 2020).

Problem statement

Despite the growing adoption of Open Educational Resources (OERs) in higher education, significant disparities persist in access, utilization, and effectiveness, particularly among students from disadvantaged backgrounds. Unequal digital infrastructure, limited internet connectivity, and inadequate access to technological devices create barriers that prevent marginalized students from fully benefiting from OERs, exacerbating the digital divide and educational inequities. Furthermore, gaps in digital literacy and inconsistent institutional support hinder the seamless integration of OERs into teaching and learning, limiting their potential to promote equity in online education. Without targeted interventions to address these disparities, OERs risk reinforcing existing socio-economic inequalities rather than serving as a tool for inclusive education. This study explores these challenges, emphasizing the need for strategic policies, institutional support, and technological investments to ensure that OERs fulfil their promise of equitable access to quality education for all learners.

Aim of the Study

This study aims to explore disparities in the access, utilization, and effectiveness of Open Educational Resources (OERs) in higher education, with a particular focus on their impact on equity in online learning, with the following objectives:

- To investigate the extent of disparities in access to OERs among students in higher education, particularly in underfunded and rural institutions.
- To analyse the role of digital literacy and technological barriers in limiting student engagement with OERs.
- To assess the effectiveness of institutional policies and support mechanisms in promoting equitable access to OERs.

The educational Literature review

Open Educational Resources have emerged as transformative tools in higher education, offering free and adaptable learning materials that address affordability and access challenges. As defined by Tlili et al. (2023), OERs are “teaching, learning, and research resources available in the public domain or under an open license, allowing no-cost use, adaptation, and redistribution.” Studies indicate that OERs contribute to reducing the cost of education and increasing access to quality learning materials, particularly for underrepresented student populations (Hilton, 2020). However, disparities in the adoption and integration of OERs persist, often resulting from unequal access to digital infrastructure, varying levels of technological literacy, and institutional limitations. A key disparity in OER utilization stems from the digital divide, particularly in developing countries and marginalized communities. Czerniewicz et al. (2020) highlight that “students from low-income households are less likely to access online resources due to limited connectivity and outdated devices.” In contrast, high-income countries benefit from robust digital infrastructure, enabling widespread adoption of OERs (Zaid & Alabi, 2020). This unequal access underscores the need for targeted investments in digital infrastructure to ensure equitable OER adoption. While some initiatives, such as government-funded internet access programs, have attempted to address these issues, the gap remains significant in many regions.

Technological literacy is another critical factor influencing disparities in OER usage. Haleem et al. (2022) argue that “digital literacy skills are essential for effectively engaging with OERs,” yet many students and educators lack the training required to navigate and adapt these resources. This conclusion is echoed by Hodgkinson-Williams and Arinto (2017), who note that “the absence of comprehensive digital literacy programs in some institutions impedes the ability of educators and learners to maximize the potential of OERs.” While institutions in high-resource settings often provide robust training and support systems, those in low-resource environments struggle to offer similar opportunities, widening the gap in OER effectiveness. Institutional policies also play a significant role in shaping OER adoption. According to Wiley and Hilton (2018), “clear institutional policies are critical for fostering an environment conducive to OER integration.” Institutions with strong policy frameworks are more likely to adopt OERs as part of their teaching and learning strategies, while those lacking such policies face fragmented and inconsistent implementation (Zaid et al., 2020). Croft & Brown (2020) emphasize that policy

alignment with institutional goals can help bridge disparities by ensuring that resources are accessible and relevant to diverse student populations.

Cultural and contextual relevance is another challenge to OER adoption. High-income countries often develop OERs, which may not align with the cultural and educational needs of students in low-income regions. Croft et al. (2020) state, “OERs must be localized to address the unique challenges and contexts of diverse learners.” While localization efforts have been undertaken by organizations like the Open Education Consortium, they remain limited in scope and impact. This viewpoint contrasts with Hilton (2020), who argues that the adaptability of OERs inherently makes them suitable for diverse contexts, though this potential is often unrealized without institutional and community support. Despite these challenges, evidence suggests that OERs can significantly enhance equity in online learning when properly implemented. Hilton (2020) highlights that “students using OERs perform as well as or better than their peers using traditional textbooks,” demonstrating the potential of these resources to narrow the achievement gap. However, Czerniewicz et al. (2020) caution that without addressing disparities in access, usage, and support, OERs may inadvertently reinforce existing inequities. Addressing these disparities requires a multifaceted approach, including investments in infrastructure, policy reform, and capacity building to ensure that the benefits of OERs are equitably distributed across all student populations.

Theoretical framework

This study is grounded in Social Cognitive Theory (SCT), developed by Albert Bandura, which provides a comprehensive lens to examine disparities in the adoption and use of Open Educational Resources (OERs). SCT emphasizes the dynamic interplay between personal factors, behaviors, and environmental influences (Szymkowiak et al., 2021), making it especially relevant for understanding the multifaceted challenges surrounding OERs. A key construct of SCT is self-efficacy—an individual’s belief in their capacity to perform specific tasks—which directly impacts one’s willingness and ability to engage with digital resources. As Schunk and DiBenedetto (2020) explain, human functioning arises from the interaction of intrapersonal, behavioral, and environmental determinants. This interaction is evident in how digital literacy and motivation influence OER use. Haleem et al. (2022) argue that digital literacy skills significantly affect users’ ability to access and benefit from OERs, suggesting that low self-efficacy can be a barrier to engagement. Conversely, individuals with high self-efficacy are more likely to overcome challenges related to technology use. Observational learning, another SCT construct, further highlights how peer-led initiatives such as workshops and mentorship can promote effective OER usage (Zaid et al., 2020), although such opportunities are often limited in under-resourced contexts (Czerniewicz et al., 2020). Institutional and environmental support also play a critical role. According to Hilton (2020), institutions with robust digital infrastructure and equitable policies are more likely to facilitate successful OER integration. Similarly, Croft et al. (2020) emphasizes that aligning institutional policies with infrastructure is essential to creating an enabling environment. Through the SCT framework, this study explores how the interconnection of personal beliefs, observed behaviours, and institutional conditions influences the equitable adoption and impact of OERs in higher education.

Method

Research Approach and Design

This study employs a qualitative research approach to explore disparities in Open Educational Resources (OERs) and their impact on equity in online learning within higher education. Qualitative methods are well-suited for capturing the lived experiences of students, educators, and administrators, offering deep insights into challenges related to digital literacy, institutional support, and policy frameworks (Creswell & Poth, 2016). A case study design was chosen to investigate a single institution actively integrating OERs, enabling a contextual understanding of how real-world institutional practices influence equitable OER adoption (Yin, 2018).

Sample and Population

The study targeted students, educators, and administrators from a higher education institution that actively uses Open Educational Resources (OERs). Using purposive sampling, 24 participants (12 students, 8 educators, 4 administrators) were selected based on their minimum six-month experience with OERs and diverse academic and socio-economic backgrounds. This ensured informed insights into issues like digital literacy, institutional support, and infrastructural challenges influencing equitable OER adoption (Creswell & Poth, 2016; Yin, 2018). Ethical principles such as informed consent, confidentiality, and voluntary participation were strictly observed, aligning with qualitative research standards focused on real-world experiences and equity in online learning environments.

Data Collection

Data were collected through semi-structured interviews and focus group discussions with 24 participants (12 students, 8 educators, and 4 administrators). Semi-structured interviews, guided by open-ended questions,

allowed participants to share in-depth experiences while maintaining alignment with research objectives (Creswell & Poth, 2018). Conducted in English, interviews lasted 20–30 minutes. Focus group discussions, each comprising 5–6 participants and lasting 45 minutes, encouraged interactive dialogue on shared challenges in OER adoption. Topics explored included accessibility, digital literacy, institutional support, and socio-economic constraints. With consent, all sessions were audio-recorded and transcribed verbatim to ensure accuracy. Field notes captured non-verbal cues and contextual nuances, enriching the data for comprehensive qualitative analysis.

Data Analysis

Data from semi-structured interviews and focus groups were analyzed using Braun and Clarke's (2006) six-phase thematic analysis process, supported by De Paoli (2023). These phases included familiarization, coding, theme identification, review, definition, and reporting. Transcripts were thoroughly examined to uncover patterns related to OER disparities, such as digital access gaps, low digital literacy, and institutional support challenges. Member checking ensured accuracy, while inter-coder reliability was maintained through an independent review. Key themes included inequitable infrastructure, limited institutional capacity, and the need for inclusive interventions. This systematic approach captured participants' lived experiences and yielded rich insights into promoting equity in higher education through OERs.

Ethical Considerations

Ethical clearance for the study was obtained from the relevant CEDU ethics committee. All participants provided informed consent before participating in interviews and focus group discussions. Confidentiality and anonymity were maintained by assigning pseudonyms and ensuring recorded data were securely stored. Participants were informed of their right to withdraw at any time without consequences. The study adhered to ethical guidelines outlined in qualitative research to protect the dignity and privacy of participants (Creswell & Poth, 2018).

Data quality and trustworthiness

To ensure data quality and trustworthiness, the study followed Lincoln and Guba's criteria of credibility, transferability, dependability, and confirmability (Schloemer & Schröder-Bäck, 2018). Credibility was enhanced through prolonged participant engagement and member checking, allowing participants to verify the accuracy of findings. Transferability was supported by providing rich descriptions of the study context and participant profiles to enable relevance in similar settings. Dependability was maintained through transparent documentation of data collection, coding, and thematic analysis processes. Confirmability was achieved by keeping a detailed audit trail and triangulating data from semi-structured interviews and focus groups, reducing researcher bias and enhancing the objectivity and integrity of the findings.

Findings

Theme 1: Access and Availability of OERs

The first major theme identified was the disparity in access to Open Educational Resources, primarily driven by differences in digital infrastructure and internet connectivity. Participants noted that students in underfunded institutions or rural areas face significant challenges accessing OERs, limiting their engagement with online learning. This lack of access undermines educational opportunities and deepens existing inequalities in academic achievement. Participants further advocated for targeted initiatives to enhance digital infrastructure in underserved areas, emphasizing the need for equitable access to educational resources for all students.

An administrator pointed out, "Despite institutional efforts to promote OERs, disparities in access remain a major barrier. While our university has attempted to integrate OERs into the curriculum, many students, particularly from disadvantaged backgrounds, face difficulties accessing these resources due to technological limitations. Addressing these disparities is crucial for achieving equitable learning outcomes across diverse student populations. Without targeted interventions to improve digital literacy and provide essential technology, the access gap will likely persist. It is essential for the university to invest in infrastructure and implement support programmes that empower all students to benefit from OERs effectively."

An educator echoed similar concerns, stating, "Many of my students struggle with accessing OERs due to issues such as inadequate internet infrastructure and a lack of personal devices. While OERs have the potential to enhance teaching and learning, the unequal distribution of digital resources means that some students are left behind, widening the equity gap in learning opportunities." This disparity affects academic performance and limits students' ability to engage fully in the digital age. It is crucial for policymakers to address these issues to ensure all learners benefit from the advantages OERs offer.

A student stated, "Restricted access to dependable internet and technological devices impedes my capacity to interact with OERs." Although OERs provide significant educational opportunities, uneven access to critical technology in some areas hinders the ability to fully utilize these resources.

Theme 2: Digital Literacy and Technological Barriers

Another significant theme that emerged was the lack of digital literacy among both students and educators. Many participants indicated that insufficient technological skills contribute to difficulties in navigating and utilizing OER platforms, exacerbating the digital divide.

An educator highlighted, "In my experience, students from disadvantaged backgrounds often find it difficult to navigate online learning platforms, affecting their ability to engage with course materials and participate in discussions. Addressing these digital literacy gaps is essential for ensuring that OERs can be effectively utilized by all students, regardless of socio-economic background".

A student expressed frustration with the lack of digital literacy: "Many of my peers struggle to effectively navigate OER platforms due to insufficient technological skills. Students from lower socio-economic backgrounds, who often have limited exposure to technology, find it particularly challenging to engage with online learning resources. This gap in digital literacy hinders their ability to fully access and benefit from OERs, creating a barrier to academic success."

Theme 3: Institutional Support and Policy Integration

Institutional support and policy integration were also identified as critical factors influencing the success of OER implementation. Universities with strong policies and resources for OER adoption reported better outcomes, while those with limited institutional backing faced challenges in promoting equity through OERs.

An administrator noted, "Institutions with established policies and resources for OER adoption tend to see better outcomes in terms of student engagement and academic success. However, many institutions still lack the necessary infrastructure and support mechanisms to make OERs accessible to all students. Without comprehensive policies and adequate resources, the full potential of OERs in promoting educational equity cannot be realized."

An educator added, "In institutions with clear policies and sufficient resources for OER integration, educators find it easier to incorporate these resources into their teaching practices. This leads to more effective and equitable learning environments. Conversely, in institutions with limited support, educators struggle to access and effectively use OERs, resulting in missed opportunities for enhancing teaching and learning."

A student emphasized, "The success of OERs in my academic journey depends largely on the level of institutional support. In universities where OER adoption is well-integrated into the curriculum, students have better access to high-quality learning materials, enhancing their learning experience. However, in institutions where OER initiatives are underfunded or lack proper policies, students often struggle to access the necessary resources, negatively affecting their academic progress."

Theme 4: Engagement and Motivation in Online Learning

The level of engagement and motivation in online learning environments was found to be directly influenced by the availability and usability of OERs. Students with better access to quality resources showed higher engagement, whereas those facing access disparities reported lower levels of participation and interest in online learning.

An administrator explained, "Engagement and motivation in online learning are directly tied to the accessibility and usability of OERs. When students have consistent access to high-quality OERs, they tend to participate more actively in their courses. However, institutions with disparities in access to OERs often struggle with lower student engagement, as some students are unable to fully benefit from these resources."

An educator observed, "When students have access to well-curated, easily navigable OERs, their interest and participation in online courses increase significantly. Conversely, when resources are difficult to access or not engaging, students often feel disconnected, leading to lower levels of academic performance."

A student reiterated, "Easy access to comprehensive and engaging learning materials makes me more enthusiastic about participating in online classes. However, students who face barriers to accessing these resources, such as slow internet or lack of device availability, often feel disconnected and less motivated to engage with their coursework, which hampers their learning experience."

Theme 5: Impact on Academic Performance and Equity

The final theme identified was the impact of OER accessibility on academic performance. The findings suggest that equitable access to OERs significantly improves academic outcomes, particularly for under-represented students, by providing free, high-quality learning materials that help bridge the achievement gap in higher education.

An administrator pointed out, "Providing free, high-quality learning materials reduces the financial burden on students, ensuring that all students, regardless of socio-economic background, can excel in their studies. Institutions with strong OER initiatives tend to see improved academic outcomes across diverse student populations."

An educator emphasised, "OERs are instrumental in supporting academic success, particularly among students who might otherwise struggle to afford traditional educational resources. By providing equitable access to high-quality materials, OERs enable students to engage more effectively with course content, reducing the achievement gap in higher education."

A student shared, "As a student from a lower socio-economic background, having free access to high-quality learning materials has alleviated the financial pressure of purchasing textbooks. This has allowed me to focus more on my studies and engage more deeply with course content. OERs play a crucial role in ensuring that all students have the same opportunity to succeed academically."

Discussion- Conclusions

This study highlights the persistent gap in practical measures to overcome technological and infrastructural barriers limiting the effective use of Open Educational Resources (OERs) in promoting equity in online education. While participants acknowledged the transformative potential of OERs in enhancing learning outcomes, their responses underscored critical challenges hindering equitable access and utilization. The administrator, educator, and student pointed to inadequate internet infrastructure, lack of personal devices, and disparities in institutional support as primary obstacles. These findings emphasize the need for strategic investments in technology, digital literacy training, and access to reliable resources to ensure equitable learning opportunities.

A central theme identified is the role of digital literacy in shaping students' ability to engage with OERs. Participants noted that insufficient digital skills, especially among students from lower socioeconomic backgrounds, contribute to difficulties in navigating online learning platforms. The educator emphasized, "students from disadvantaged backgrounds often find it difficult to navigate online learning platforms," while the student noted, "limited exposure to technology makes it challenging to engage with online learning resources." These perspectives align with literature linking digital literacy to student engagement and success in online learning (Redecker & Punie, 2017). Bandura's (1986) social cognitive theory provides a relevant framework here. The theory posits that self-efficacy an individual's belief in their ability to succeed—plays a critical role in learning. A lack of confidence in using digital tools discourages participation and reinforces academic disparities. Without adequate digital literacy training, students may struggle with self-regulated learning, limiting their ability to benefit from OERs. Addressing these challenges requires targeted interventions, including structured digital literacy programs, mentorship initiatives, and development of user-friendly OER platforms tailored to diverse learner needs.

The study also highlights the pivotal role of institutional support and clear policies in effective OER adoption. Participants agreed that universities with strong policies and resources for OER integration experience better outcomes in student engagement and academic success. The administrator emphasized, "robust institutional frameworks yield better outcomes," while the educator and student stressed that inadequate guidance and resources limit the benefits of OER adoption. These findings align with Wiley and Hilton (2018), who argue institutional investment in OERs influences their effectiveness in promoting educational equity. Social Cognitive Theory suggests institutions must foster collective agency by creating environments where both educators and students can utilize OERs. This involves providing training, technological support, and incentives for faculty to integrate OERs into curricula. Policymakers should ensure OER implementation aligns with broader institutional goals for inclusivity and academic success. Without systemic support, disparities in OER adoption are likely to persist, reinforcing inequalities in higher education.

The study suggests that equitable access to high-quality OERs enhances student engagement and motivation in online learning. Participants agreed that well-designed and accessible OERs encourage active participation, while technological barriers and poorly structured resources contribute to disengagement. The administrator emphasized, "access to well-curated, high-quality resources is essential for fostering motivation," while the student noted, "without easy access to relevant OERs, their ability to engage fully with course material is limited." These findings can be explained through Bandura's (1986) concept of self-efficacy and observational learning. When students see peers effectively using OERs, they are more likely to engage. Conversely, limited access leads to frustration and disengagement, particularly among students facing socio-economic challenges. To enhance engagement, institutions should improve OER design and usability, incorporating interactive elements such as multimedia, forums, and adaptive technologies that cater to diverse learning styles.

A key finding is that OERs significantly contribute to improving academic performance, especially for underrepresented students. The administrator, educator, and student agreed that OERs provide free, high-quality materials that reduce financial burdens and enhance academic success. This aligns with research indicating OERs promote equity by bridging the achievement gap and ensuring all students have access to the same resources, regardless of financial background (Fischer et al., 2015). Bandura's concept of "mastery experiences" suggests when students successfully engage with OERs, their confidence increases, leading to improved performance. As the educator stated, "OERs provide students with the resources they need to succeed," and the student added, "Without OERs, I wouldn't have had access to the materials I needed to excel." These insights reinforce the need for institutions to prioritize OER adoption to foster academic equity and student success.

Limitations

A major drawback of this study on Disparities in Open Educational Resources: Promoting Equity in Online Learning for Higher Education is that it uses qualitative data from a small group, which might not represent the wider experiences of students and teachers in different colleges and universities. While the findings provide valuable insights into the challenges of digital access, digital literacy, and institutional support, the study lacks a quantitative component that could offer statistical validation and generalizability of the results. Additionally, the study focuses primarily on participant perspectives without incorporating a comprehensive analysis of existing policy frameworks or technological infrastructure at the institutional level, which could provide a more holistic understanding of the issue. Future research could improve on these limitations by using different research methods and including a broader group of universities that have different levels of OER implementation and support.

Implications for Policy and Practice

The findings of this study have significant implications for practice in higher education, particularly in addressing disparities in Open Educational Resources (OERs) to promote equity in online learning. Institutions must prioritize investments in digital infrastructure, including expanding internet access and providing affordable or subsidized devices to students from disadvantaged backgrounds. Additionally, universities should implement comprehensive digital literacy programs to equip both students and educators with the necessary skills to effectively navigate and utilize OER platforms. Policymakers and institutional leaders must also develop clear policies that mandate and support the integration of OERs into curricula, ensuring that all students, regardless of socio-economic status, have equal access to high-quality learning materials. Furthermore, fostering collaboration between universities, government agencies, and technology providers can enhance the sustainability and accessibility of OER initiatives, ultimately bridging the digital divide and fostering more inclusive learning environments.

In conclusion, this study underscores the transformative potential of Open Educational Resources (OERs) in promoting equity in online learning within higher education, while also revealing critical disparities that hinder their full effectiveness. Despite the promise of OERs to expand access to high-quality educational materials, challenges such as unequal digital literacy, limited technology access, and inadequate institutional support continue to impede their equitable use. Addressing these barriers requires a multifaceted strategy involving targeted policy reforms, investments in digital infrastructure, and comprehensive digital literacy training. By implementing such measures, higher education institutions can ensure that all students regardless of socioeconomic status have meaningful access to and engagement with OERs. Achieving true equity in OER adoption thus necessitates not only technological access but also robust support systems that empower students to fully benefit from open education.

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