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Digital Inclusion in Distance Education with Special Reference to KKHSOU: Bridging the Gap for Marginalised Learners in Assam

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Abstract

Open and distance learning (ODL) has been central to widening educational access in India. In Assam, Krishna Kanta Handiqui State Open University (KKHSOU) occupies a pivotal role in reaching learners across river islands (chars), flood-prone districts, tea garden communities, hill regions, and the Bodoland Territorial Region (BTR). Yet, digital transformation in ODL risks reproducing inequities when connectivity, affordability, accessibility, and cultural-linguistic relevance are uneven. This paper proposes a KKHSOU-centred framework for digital inclusion—spanning infrastructure, skills, accessible design, multilingual content, learner support, and governance—grounded in the capability approach, universal design for learning (UDL), and multi-level digital divide scholarship. It synthesises literature, contextualises barriers unique to Assam, and outlines a qualitative research and action plan, including low-cost interventions (offline learning packs, community radio partnerships, local language micro-modules, inclusive assessment), an institutional Monitoring & Evaluation (M&E) rubric, and recommendations for sustainable, equity-focused digital transformation. The paper argues that meaningful inclusion requires moving beyond device and data provision to curricular justice and participatory support ecologies that recognise the lived realities of marginalised learners.

Keywords: #KKHSOU #ICT #OpenAndDistanceLearning #DigitalInclusion #MarginalisedLearners

1. Introduction

Open and distance education was conceived to remove barriers of place, time, and prior opportunity. In Assam, those barriers include seasonal floods that disrupt mobility, dispersed settlements on river islands, linguistic diversity across Assamese, Bodo, Bengali, and numerous tribal languages, and persistent socio-economic disadvantage among tea garden workers, char-chapori communities, and first-generation learners. Krishna Kanta Handiqui State Open University (KKHSOU), as the state open university, has built an extensive network of study centres and programmes that cater to working adults, women with caregiving responsibilities, and learners unable to relocate for campus study. As the university's teaching-learning processes increasingly rely on digital platforms, there is an urgent need to ensure no learner is left behind.

This paper addresses the question: How can Krishna Kanta Handiqui State Open University operationalise digital inclusion to improve equitable participation, learning, and progression for marginalised learners in Assam? It offers a conceptual foundation, a research design for assessing inclusion, and a practical playbook of interventions that are affordable, scalable, and sensitive to Assam's geography and cultures.

Objectives of the research study :

The main objectives of the present study are –

- i. To examine the concept and dimensions of digital inclusion in the context of distance education, with a focus on its role in enhancing access, equity, and quality in higher education.
- ii. To identify the challenges and barriers faced by marginalized learners in adopting and utilizing digital technologies for effective participation in distance education.
- iii. To evaluate the initiatives and strategies undertaken by KKHSOU to promote digital inclusion and ensure equitable learning opportunities for all students.
- iv. To explore the role of digital inclusion in bridging the educational divide and empowering marginalized groups in Assam through open and distance learning.

Methodology of the study

This paper adopts a qualitative and descriptive research design in which Krishna Kanta Handiqui State Open University (KKHSOU), the first and the only state open University of India's North East has been taken as a case study. The analysis is based on secondary data collected from journal articles, KKHSOU publications, and policy documents related to digital inclusion and ODL. The study also draws insights from theoretical frameworks, such as Delors' Four Pillars of Education (learning to know, learning to do, learning to live together, and learning to be) and digital divide theory, to interpret the findings. The discussion incorporates existing case studies and contextual evidence from Assam.

Literature review

Early digital divide scholarship often framed inequity as a binary gap in access to devices or the internet. Subsequent work emphasised second level divides—skills, usage, and outcomes—and third level divides relating to social and economic benefits (van Dijk, 2020; Selwyn, 2016). The capability approach (Sen, 1999) shifts attention from resources to the real freedoms individuals have to pursue valued learning. In ODL, this means focusing on learners' opportunities to participate, succeed, and translate learning into livelihood and civic agency, not merely logging in to a portal.

Warschauer (2003) argues that technology's educational value depends on access to devices, content, language, literacy, and social support. In distance education, learner support services—advising, tutoring, peer communities, and local study centres—mediate digital participation and persistence (Tait, 2000; Anderson & Dron, 2011). MOOCs and blended ODL show that openness without scaffolding may widen inequities in completion (Hansen & Reich, 2015). These insights underpin the need for inclusive instructional design and context aware delivery models.

Inclusive pedagogy recognises learner diversity in culture, language, ability, and prior knowledge. Universal Design for Learning (UDL) recommends multiple means of representation, engagement, and expression (CAST, 2018). For ODL in India, this translates into multilingual, low bandwidth materials; alternative formats (audio, transcripts, captions); and flexible assessment pathways that acknowledge connectivity constraints and accessibility needs.

Open licensing enables adaptation for language, culture, and accessibility. OER aligned with local contexts—vernacular examples, indigenous knowledge, and community case studies—can counter cultural marginalisation while reducing costs. However, OER adoption requires institutional policy, staff capacity to adapt content, and quality assurance mechanisms (Wiley, 2014).

In regions with fragile connectivity, community radio, local cable TV, and offline distribution (SD cards, USBs) remain vital complements to online delivery. Research in development communication shows that local media can amplify learner voice and provide culturally resonant scaffolding, particularly when coupled with facilitation through study centres or NGOs.

Theoretical framework

The study on digital inclusion in distance education at KKHSOU can be situated within two interrelated theoretical perspectives:

The digital divide framework (Digital Divide Theory) provides the foundation for understanding the disparities in access, skills, and outcomes of technology use. Van Dijk (2020) distinguishes three levels of digital divides – access divide, skills divide and outcome divide.

Access divide refers to unequal availability of internet connectivity, devices, and infrastructure. Skills divide is the differences in digital literacy and ability to effectively use ICT tools. Outcome divide is the unequal benefits derived from digital engagement in terms of education, employment, and civic participation.

In the context of KKHSOU, these divides manifest as rural learners struggling with poor internet connectivity, first-generation learners lacking digital confidence, and marginalized groups unable to translate digital learning into social mobility. UNESCO's Delors Report (1996) or the Delors' Four Pillars of Education emphasizes four essential pillars: *learning to know*, *learning to do*, *learning to live together*, and *learning to be*. These provide a holistic vision of lifelong learning, which resonates with the mission of ODL. Digital inclusion enables:

- Learning to know by widening access to online knowledge resources.
- Learning to do by equipping learners with digital and vocational skills.
- Learning to live together by fostering collaborative online communities across diverse cultural and linguistic groups in Assam.
- Learning to be by empowering marginalized learners to achieve personal growth and self-reliance through accessible education.

Together, these frameworks highlight that digital inclusion in ODL is not merely about access to devices or portals but about enabling meaningful learning and life opportunities.

Concept of Digital Inclusion :

Digital inclusion refers to the practice of ensuring that every individual, regardless of their socio-economic, geographical, cultural, or physical background, has equal opportunity to access, use, and benefit from digital technologies. It is not limited to providing internet connections or devices; rather, it encompasses a broader framework that includes access, affordability, digital literacy, and the creation of inclusive digital environments.

In other words, digital inclusion is about closing both the digital divide—the gap between those who have digital access and those who do not—and the usage divide, which arises when people are unable to use available technologies to their full potential. When implemented effectively, digital inclusion enhances opportunities for education, employment, healthcare, civic engagement, and overall social development. In the field of Open and Distance Learning (ODL), digital inclusion signifies creating equal opportunities for all learners to access, utilize, and benefit from digital platforms and resources that support education. Since distance education relies heavily on technology for delivering content, fostering communication, and enabling assessments, ensuring digital inclusion becomes fundamental to fulfilling its promise of democratizing education.

In the context of KKHSOU, digital inclusion means providing equitable access, building digital skills and designing inclusive content. When we talk about providing equitable access, we refer to offering online learning platforms, mobile-based applications, and offline digital resources to reach students in regions with poor connectivity. As far as building up of digital skills is concerned, learners and facilitators must be trained in the effective use of ICT tools, thereby enhancing their confidence and participation in digital learning environments.

By embedding digital inclusion into its ODL practices, KKHSOU not only addresses the digital divide in Assam but also empowers marginalized learners to participate meaningfully in the knowledge economy. This strengthens the university's mission of making higher education more flexible, inclusive, and socially relevant. In other words, ODL acts as a powerful lever for educational equity by directly targeting the specific barriers faced by marginalised populations:

Digital inclusion in the context of Assam and KKHSOU's Mandate

Assam's educational landscape is shaped by geographic fragmentation (chars, hill districts), seasonal disasters (floods, erosion), and pockets of poor connectivity. Tea garden communities often face intergenerational educational disadvantage, while char settlements experience infrastructural precarity and limited last-mile services. The BTR and several tribal-majority districts present distinct linguistic and cultural contexts. Digital resources are often developed in English or Hindi, which can marginalize learners from indigenous and tribal communities. Ensuring multilingual digital content in Assamese and other regional languages is necessary for inclusion. Culturally relevant learning materials can help in making digital platforms more meaningful for local users. Schemes such as *Digital India*, *BharatNet*, and *PMGDISHA (Pradhan Mantri Gramin Digital Saksharta Abhiyan)* have attempted to expand broadband and provide digital literacy training in Assam. While these have improved access in some areas, coverage remains uneven, especially in remote districts.

Nokia, in collaboration with Bal Raksha Bharat (Save the Children), has launched the SMARTPUR initiative to build model smart villages aligned with the Government of India's *Digital India* vision. The initiative goes beyond simply providing digital devices or internet access, recognizing that a truly smart village requires the integrated and efficient use of resources to generate meaningful social, ecological, and

economic outcomes. The SMARTPUR model operates around six key areas of intervention: *Education, Health, Livelihood, Governance, Finance, and Entertainment*. The first digital centre under the SMARTPUR project was launched in the district of Dhemaji, Assam in December 2022.

Women, particularly in rural and conservative communities, face greater challenges in accessing digital tools due to cultural restrictions, financial dependence, and lack of training. Promoting digital literacy among women is crucial for broader social inclusion. Community radio, NGOs, and grassroots organizations play a vital role in contextualizing digital initiatives. By acting as intermediaries, they can train marginalized groups, provide localized content, and encourage community participation in the digital ecosystem.

The mandate of KKHSOU is to democratise higher education. This requires tailored strategies that go beyond generic ODL practices and directly engage these realities. As the only state open university in Assam, KKHSOU has undertaken several initiatives to integrate digital tools into the teaching and learning environment like launching mobile learning applications and Learning Management Systems (LMS), utilisation of community radio and local media to reach learners in low-bandwidth areas and organizing capacity-building workshops for students and faculty on ICT use.

These initiatives illustrate the university's efforts to align with the goals of inclusive education. However, challenges such as device affordability, patchy connectivity, and limited institutional resources persist.

Before we move further into the analysis part, let us look into important ICT enabled learning environment at KKHSOU. Krishna Kanta Handiqui State Open University has steadily integrated Information and Communication Technology into its teaching, learning, and support systems to enhance accessibility and engagement for distance learners across Assam. Some of the important support services include-

Learning Management System (LMS)

KKHSOU has developed its own LMS that serves as a central platform for hosting study materials, lecture videos, assignments, and discussion forums. The LMS is designed to be mobile-friendly, considering that a large proportion of learners access resources via smartphones. It provides flexibility in accessing content asynchronously, which is particularly helpful for learners in low-connectivity areas.

Mobile Learning Applications

The university has introduced mobile-based applications to extend digital learning opportunities. These apps allow learners to download resources, view recorded lectures, and interact with faculty. Mobile applications have become critical tools since smartphones are the most widely available digital devices among students.

Digital Study Materials and E-Resources

KKHSOU provides e-books, PDFs, and multimedia study resources that can be downloaded for offline use. The university has also expanded its access to e-libraries and open educational resources (OER), enabling learners to supplement their course materials with additional digital references.

Multimedia and Broadcast Media

To overcome bandwidth challenges, the university uses community radio services to broadcast lectures and educational programs.

Video Lectures and Online Classes

During the COVID-19 pandemic, KKHSOU adopted live online classes through platforms such as Zoom and Google Meet. While connectivity challenges limited participation for some learners, the recorded versions of these lectures were made available for later access, ensuring flexibility.

ICT in Learner Support

ICT tools are also embedded in student support services. Helplines, WhatsApp groups, and email communication channels provide learners with academic counselling, administrative support, and peer interaction. Study centres across Assam are gradually being upgraded with computers and internet facilities to act as digital hubs.

Assessment and Evaluation Tools

Assignments and project submissions have increasingly shifted to digital formats. The university also uses ICT-enabled evaluation systems for conducting online quizzes, internal assessments, and, in certain cases, proctored examinations.

Faculty Development in ICT

Recognizing the importance of digitally competent educators, KKHSOU organizes training workshops for faculty to strengthen their use of digital tools, online pedagogy, and blended teaching methods.

Addressing the needs of the marginalised learners is something that needs a long term approach. KKHSOU has a specific mandate to reach sections of society traditionally excluded from higher education. Its approach is multi-faceted, targeting geographical, economic, social, and physical barriers.

i. Geographical Reach and Regional Focus

- **State-Wide Network:** KKHSOU has established an extensive network of Study Centres and Learner Support Services (LSS) across the remote and often inaccessible areas of Assam. This brings the university's resources closer to learners in rural and tea-garden areas, eliminating the need to travel long distances to urban centres.
- **Relevant Regional Content:** The university designs its curriculum with a focus on the socio-cultural context of Northeast India. This includes offering programmes in local languages and on topics relevant to the region's economy and society, making education more relatable and applicable for local learners.

ii. Economic Accessibility

- **Affordable Fee Structure:** Compared to conventional universities, KKHSOU's programmes are significantly more affordable. This low-cost model is crucial for attracting learners from low-income families, daily wage earners, and those who cannot afford the high tuition and associated costs of regular colleges.
- **No Hidden Costs:** By enabling students to learn from home or a nearby study centre, KKHSOU eliminates major ancillary costs like hostel fees, daily commuting expenses, and the cost of relocating to a city.

iii. Programmes for Employability and Empowerment

KKHSOU offers a range of programmes specifically tailored to enhance the skills and employability of marginalised groups:

- **Skill-Based and Vocational Courses:** The university offers certificates and diplomas in areas like Tea Cultivation, Electrical House Wiring, Tourism Management, and Computer Application. These are designed to provide immediate, practical skills that can lead to self-employment or better job prospects, which is a primary need for economically disadvantaged learners.

iv. Inclusive Policies and Target Groups

The university proactively identifies and designs support for specific marginalised communities:

- **Tea-Garden Community:** Assam has a large population living in tea gardens, often isolated and with limited educational access. KKHSOU actively reaches out to these communities, setting up support systems and encouraging enrolment.
- **Differently-Abled Learners:** The visually impaired learners are provided with free audio SLMs in CDs to overcome their difficulties of learning. The University has installed Braille printers for this category of special learners in the University SLM branch. The flexibility of ODL itself is a major benefit for learners with physical disabilities who find attending a regular college challenging.
- **Senior Citizens and Homemakers:** The open and flexible learning system allows these often-overlooked groups to pursue education at their own pace, fulfilling their personal and intellectual goals.

v. Flexible Learning Methodology

- **Self-Paced Learning:** The core ODL model allows students to balance their studies with work, family responsibilities, and agricultural cycles. This is vital for farmers, daily wage labourers, and women with domestic duties.
- **Multi-Media Study Materials:** KKHSOU provides printed self-learning materials (SLMs) in both English and Assamese. These are the primary mode of instruction, ensuring access for those with limited or no internet connectivity. They are complemented by audio-visual aids and online resources for those who can access them.

Thus, KKHSOU addresses the needs of marginalised learners through a strategic combination of geographical penetration, affordable education, relevant curriculum, targeted programmes, and a flexible, multi-modal delivery system that does not solely depend on high technology. Its mission is fundamentally aligned with the goal of taking education to the doorsteps of those who need it most.

Analysis and discussion

The analysis of digital inclusion in the context of Krishna Kanta Handiqui State Open University requires an approach that blends the structural realities of Assam with the pedagogical and technological responsibilities of open and distance learning (ODL). By applying the Digital Divide Theory (van Dijk, 2020) and Delors' Four Pillars of Education (1996), this discussion seeks to interpret the institutional practices of KKHSOU and their implications for marginalized learners. The analysis unfolds across four themes: (a) infrastructural access and affordability, (b) digital literacy and learner capabilities, (c) inclusive pedagogy and learner support, and (d) the transformative role of digital inclusion in bridging social and educational gaps.

Infrastructural Access and Affordability

The first level of the digital divide relates to access. In Assam, the uneven distribution of ICT infrastructure creates significant challenges. Rural districts, hilly terrains, and tea garden communities experience weak or unstable internet connectivity. According to government reports, internet penetration in Assam lags behind the national average, and many villages still depend on low-speed mobile data connections.

For KKHSOU learners, the cost of devices and data adds another barrier. Smartphones have become the most common device for accessing digital education, yet not all learners can afford them. Even when devices are available, shared use within families reduces dedicated learning time.

Digital Literacy and Learner Capabilities

The second-level digital divide emphasizes skills and competencies. Having a device or internet connection does not guarantee effective learning. Digital literacy—the ability to navigate platforms, critically assess online information, and use ICT tools productively—is essential for successful participation in ODL.

At KKHSOU, many learners are first-generation learners with limited prior exposure to technology. For them, logging into a portal, downloading assignments, or accessing a digital library can be daunting. Without structured training, such learners are at risk of disengagement. This aligns with Warschauer's (2003) argument that meaningful access requires not just hardware but also social and educational support. The university has taken initiatives such as conducting digital orientation sessions for new learners, organizing workshops on ICT skills for faculty and students and providing helplines and technical support for troubleshooting. The capability approach (Sen, 1999) highlights that what matters is not just access but the real freedoms learners have to achieve outcomes they value. For many KKHSOU students, the freedom to pursue higher education is contingent upon their ability to translate digital access into academic success and livelihood opportunities. This makes capacity-building central to digital inclusion.

Inclusive Pedagogy and Learner Support

Distance education is more than a delivery of content; it is a support-intensive model. Learner persistence depends on scaffolding services such as advising, tutoring, peer interaction, and feedback mechanisms (Tait, 2000). In digital environments, inclusive pedagogy must recognize diversity in culture, language, economic background, and ability.

KKHSOU operates a network of study centres that act as local hubs for advising and peer interaction. These centres play a vital role in bridging the digital gap by providing computers, internet access, and academic counselling. However, the effectiveness of these centres varies widely depending on local resources. Strengthening partnerships with NGOs and community organizations can enhance these ecosystems.

The analysis aligns with Anderson and Dron's (2011) observation that pedagogy in ODL has evolved across three generations—cognitive-behaviourist, social constructivist, and connectivist. For KKHSOU, the challenge is to integrate these approaches in a way that balances digital innovation with local constraints.

Through the lens of Delors' Four Pillars, digital inclusion at KKHSOU supports - *Learning to know* (Access to knowledge through digital libraries and e-resources), *Learning to do* (Application of skills via ICT and vocational programs), *Learning to live together* (Collaboration across diverse cultural and linguistic groups) and *Learning to be* (Empowerment and self-realization of marginalized learners).

In spite of the integration of different technological tools and platforms, a few challenges remain. Connectivity gaps in remote areas, limiting participation is one of the major problems. Lack of proper internet connectivity can hamper the seamless flow of online resources to the learners. Learners in border regions or remote rural areas are frequently unable to join live online sessions, forcing them to rely heavily on offline resources. Thus, while infrastructural initiatives exist, their reach is uneven, creating a layered digital divide. Now, learners belonging to the economically weaker sections might find it difficult to get hold of devices and data that support online learning. Most of the first generation learners are not very well versed with digital literacy. This might create problem in accessing learning materials – both in online and offline format in the long run. Even though the University conducts online counselling sessions, learners in rural areas often miss training opportunities due to connectivity issues. Furthermore, older

learners—who form a significant proportion of KKHSOU’s student base—face greater difficulty adapting to digital platforms.

Without addressing these structural gaps, digital inclusion risks becoming a rhetorical goal rather than a lived reality.

Pathways for Advancing Digital Inclusion in Distance Education

Infrastructure Partnerships:

Expanding connectivity and device access is the foundation of digital inclusion. By collaborating with telecom providers and leveraging government schemes, KKHSOU can extend broadband coverage to rural and remote areas of Assam. Subsidized or low-cost devices for students from marginalized backgrounds will reduce entry barriers and ensure that learners can participate in online courses without financial strain.

Integrated Digital Literacy Programs:

Access to technology alone is not sufficient—learners and faculty must know how to use it effectively. Mandatory digital literacy modules for students will help them navigate the LMS, use online resources, and submit digital assignments. Likewise, ongoing professional development for faculty will strengthen their ability to design engaging online content, use ICT tools, and support diverse learners.

Institutionalization of UDL (Universal Design for Learning):

To address learner diversity, KKHSOU should embed UDL principles into its curriculum and digital platforms. This includes developing content in multiple languages, offering resources in alternative formats (such as audio, transcripts, or low-bandwidth versions), and adopting flexible assessment strategies. Such measures make learning more accessible for students with varying abilities, socio-economic backgrounds, and technological access levels.

Strengthening Study Centres:

Study centres can play a transformative role by functioning as digital hubs. Equipping them with reliable internet, computers, and trained facilitators will allow learners without personal connectivity to access resources and participate in digital activities. Study centres can also serve as support spaces for peer collaboration, mentoring, and blended learning.

Community-Based Approaches:

Cultural relevance and social support enhance digital participation. By collaborating with local media outlets, NGOs, and community organizations, KKHSOU can contextualize learning content in local languages, incorporate community knowledge, and provide culturally resonant learning experiences. Community-based facilitators can also bridge the gap for learners who are first-time users of digital tools.

Policy Mainstreaming:

For sustainability, digital inclusion must be embedded into the university’s core mission and operational framework. This involves allocating dedicated budgets, establishing quality assurance mechanisms, and integrating digital inclusion goals into policy documents, strategic plans, and evaluation frameworks. Such institutional commitment ensures that digital inclusion is not treated as a temporary project but as a long-term educational priority.

Conclusion

Digital inclusion is no longer an optional add-on for open and distance learning; it is a fundamental prerequisite for ensuring equity and quality in higher education. The case of KKHSOU highlights how the digital divide in Assam extends beyond mere access to devices and internet connectivity, encompassing deeper challenges of digital literacy, inclusive pedagogy, and sustained learner support. While the university has initiated several ICT-driven measures, the persistence of infrastructural gaps, linguistic diversity, and socio-economic disparities demands a more comprehensive and systemic response.

The findings of this study underscore that bridging the digital divide requires a multi-pronged approach: building infrastructure through partnerships, embedding digital literacy into the learner journey, adopting Universal Design for Learning (UDL), and strengthening study centres as local digital hubs. Equally important is the role of community-based approaches that situate digital learning in local contexts and the institutionalization of digital inclusion as a policy priority within KKHSOU.

If implemented effectively, these pathways can transform KKHSOU into a model of inclusive open and distance learning in India. More importantly, they will empower marginalized learners in Assam not only to access education but also to translate it into meaningful opportunities for livelihood, social mobility, and civic participation. By aligning digital inclusion with its mission of lifelong learning, KKHSOU has the potential to bridge structural inequalities and contribute to the creation of a more just and knowledge-driven society.

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