

Digital Inclusion and Learner Engagement in Distance Education with special reference to K.K Handiqui State Open University

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In the evolving landscape of higher education, digital inclusion and learner engagement have become foundational to the success of distance education systems. This paper explores the interconnection between these two elements within the context of Krishna Kanta Handiqui State Open University (KKHSOU), a premier institution offering open and distance learning in Assam. The study investigates how access to digital tools, internet connectivity, and digital literacy influence students' ability to participate meaningfully in academic activities. Based on survey responses from 383 learners across various programs, the analysis reveals that while a majority of students possess digital devices and show enthusiasm toward online learning, challenges such as unstable internet access, limited digital skills, and low interaction levels continue to hinder effective engagement. The paper further highlights the importance of designing inclusive digital ecosystems and fostering interactive learning environments to enhance motivation, participation and academic success. Through this focused case study, the research underscores the urgent need for policy interventions and institutional strategies to bridge the digital divide and improve learner engagement in distance education.

Keywords: Digital Inclusion, Learner Engagement, Distance Education, Krishna Kanta Handiqui State Open University

Introduction

The world of open and distance learning has expanded in unimaginable ways with the inclusion of ICT tools within its fold. Distance education as a field focuses on the pedagogy and andragogy, technology and instructional systems design that aims to deliver education to its learners who are not physically present 'onsite'. Gone are the days when self-learning materials used to be the mainstay of the field of open and distance learning. With each passing day, newer forms of technology are being developed and incorporated within the educational framework at different levels. This is basically done in order to supplement the textual material and add an interesting twist to the delivery of learning resources. Technology enabled learning helps in making the teaching-learning process interesting and informative. In fact, it helps the learners to think out of the box and dig deeper into different issues concerning their academic disciplines. When we talk about digital inclusion, it usually refers to the process of ensuring that all individuals and communities, including the most disadvantaged, have access to and the ability to use information and communication technologies (ICTs). In the context of distance education, digital inclusion plays a transformative role in bridging the digital divide and enhancing equitable access to learning opportunities. For institutions like Krishna Kanta Handiqui State Open University (KKHSOU), which serves a diverse and geographically dispersed learner base, digital inclusion is fundamental to fulfilling its mission of democratizing education. Learner engagement is also another important area which is being stressed upon in recent times. Learner engagement usually refers to the degree of attention, curiosity, interest, and participation that students show in the learning process. In distance education, where physical classroom interaction is limited or absent, engagement becomes even more critical for meaningful learning experiences and academic success. This particular paper tries to look into the importance of digital inclusion and learner engagement with special reference to KKHSOU.

Objectives of the present study

The main objectives of the present research study are -

- To explore the concept and significance of digital inclusion and learner engagement in the context of distance education.
- To analyze the initiatives and strategies adopted by KKHSOU to promote digital inclusion among its learners.
- To assess the effectiveness of KKHSOU's learner engagement mechanisms in fostering academic participation and retention.
- To identify the challenges faced by students and faculty in ensuring inclusive and engaging digital learning experiences.

- To propose recommendations for improving digital access and student engagement in the context of open and distance learning, particularly in socio-economically diverse regions like Assam

Methodology of the present study

This study employs a qualitative and quantitative (mixed method) case study approach to examine the relationship between digital inclusion and learner engagement in the context of distance education at Krishna Kanta Handiqui State Open University (KKHSOU). In other words, the research draws on both primary and secondary sources. As far as secondary data is concerned, university policy documents, annual reports, official publications, digital content repositories, and previous research studies related to KKHSOU's digital initiatives were thoroughly reviewed. Additional scholarly articles on digital inclusion and learner engagement in the Indian ODL context were also consulted to support the conceptual framework. For primary data collection, a survey was conducted with a purposive sample of students of KKHSOU to gain deeper insights into digital inclusivity and engagement. In addition, a few faculty members and other support staff of KKHSOU were consulted to gather experiential perspectives.

To ensure the reliability and validity of the survey, a self-constructed questionnaire was developed specifically for this study. The questionnaire was aligned with the research objectives and the conceptual framework, drawing on previous literature on digital inclusion and learner engagement. Content validity was ensured through review by a panel of three subject experts, including faculty experienced in ODL pedagogy and digital learning initiatives. Feedback from the experts was incorporated to refine the clarity, relevance, and comprehensiveness of the items. A pilot test was conducted with 25 students to assess understandability, language clarity, and response consistency. Minor modifications were made based on this pilot feedback to improve phrasing and ensure contextual appropriateness for the target population. The reliability of the questionnaire was calculated using Cronbach's alpha, yielding a value of 0.82, indicating high internal consistency. This process ensured that the tool was both valid and reliable for capturing data on digital inclusion and learner engagement.

By standardizing the self-constructed questionnaire in this manner, the study ensured that data collected were accurate, consistent, and reflective of students' experiences, thereby enhancing the credibility and robustness of the research findings.

Theoretical Framework

This study is grounded in two interrelated theoretical models: the Technology Acceptance Model (TAM) and Moore's Theory of Transactional Distance. These frameworks help explain how digital inclusion affects learner behaviour and engagement in a distance learning context.

Developed by Davis (1989), TAM suggests that an individual's acceptance and use of technology is determined by two factors: perceived usefulness and perceived ease of use. In this study, TAM helps interpret how students' perceptions of digital tools—such as LMS, mobile apps, and online classrooms—affect their willingness to engage with the content. Greater perceived utility and usability of digital platforms lead to higher engagement levels.

Proposed by Michael G. Moore (1993), the theory of Transactional Distance posits that the psychological and communication space between learners and instructors in distance education must be minimized to enhance learning. Transactional distance is influenced by dialogue, structure, and learner autonomy. Digital inclusion plays a vital role here by enabling real-time communication, flexible content delivery, and learner autonomy—thereby reducing transactional distance and fostering deeper engagement. By integrating TAM and the Theory of Transactional Distance, the framework underscores how the availability, usability, and strategic application of digital tools (digital inclusion) contribute to reducing learner isolation and promoting academic interaction (learner engagement). This dual framework provides a robust lens to evaluate how institutional interventions at KKHSOU translate into tangible learner outcomes.

Importance of Digital Inclusion and Learner Engagement in Distance Education

In today's digital age, distance education has emerged as a powerful alternative to conventional classroom learning. However, for this mode of education to be truly effective, two key components are essential: digital inclusion and learner engagement.

Digital inclusion refers to the availability and accessibility of digital tools, internet connectivity, and technological literacy to all individuals, regardless of their socio-economic or geographical backgrounds. Digital inclusion helps bridge the gap between urban and rural learners by providing the same learning resources to all, thus promoting educational equity. It supports continuity in learning. Students who may be unable to attend physical classes due to distance, disability, or personal constraints can continue their education without interruption.

Digital inclusion also enables participation. Access to devices, internet, and digital platforms ensures that learners can fully participate in online classes, discussions, and assessments. It even empowers marginalized

communities. Digital inclusion helps underserved communities improve their educational prospects and overall quality of life through skill development and knowledge enhancement.

Learner engagement on the other hand, is about how involved, motivated, and connected learners feel during the learning process. In distance education, where learners are often isolated, maintaining engagement becomes even more crucial. Engagement refers to the level of involvement and interaction that learners have with their studies, instructors, and peers. In ODL, engagement can be categorized into three main types: behavioural engagement, cognitive engagement, and emotional engagement.

Behavioural engagement refers to the observable actions and participation of learners in their educational activities. Behavioural engagement is essential for ensuring that learners stay on track and meet the requirements of their courses. It is often the most visible form of engagement and can be measured through analytics and participation metrics. Cognitive engagement involves the mental effort and focus that learners invest in understanding and mastering the course material.

Cognitive engagement is crucial for achieving meaningful learning outcomes, as it encourages learners to go beyond surface-level understanding and develop higher-order thinking skills. Emotional engagement refers to the feelings and attitudes that learners have toward their studies and the learning environment. Emotional engagement is vital for maintaining motivation and preventing burnout, especially in ODL, where learners often study independently and may face distractions or competing priorities.

Learner engagement is said to improve academic performance. When students are actively engaged, they understand concepts more clearly, participate more often and perform better in assessments. It also reduces dropouts. An engaging learning experience keeps students interested and motivated thus lowering the chances of dropout. Learner engagement fosters interaction and encourages independent learning. Engagement through discussion forums, live sessions and collaborative projects builds a sense of community and reduces the feeling of isolation. Engaged students are more likely to take initiative, manage their time effectively, and explore subjects beyond the curriculum.

In ODL, motivation and engagement are closely intertwined. Motivated learners are more likely to engage actively with their studies, while engaged learners often find their motivation reinforced through positive experiences. For instance, intrinsic motivation can lead to deeper cognitive engagement, as learners are driven by curiosity and a desire to learn. Extrinsic motivation, such as the prospect of earning a degree, can encourage behavioural engagement by prompting learners to complete assignments and attend sessions. On the other hand, social motivation can enhance emotional engagement by fostering a sense of community and support. Educators in ODL can leverage this interplay by designing courses that cater to different types of motivation and engagement. They can incorporate interactive and multimedia content to stimulate intrinsic motivation and cognitive engagement. Timely feedback and recognition can also be provided to reinforce extrinsic motivation and behavioural engagement. Opportunities can also be created for collaboration and interaction in order to enhance social motivation and emotional engagement.

There is a relationship between digital inclusion and learner engagement. Access to digital resources enhances self-paced learning, interaction through LMS, forums, chats and participation in online assessments and webinars.

While lack of access leads to dropouts or poor performance, reduced communication and passive learning

Digital Inclusion and learner engagement strategies at K.K Handiqui State Open University

Krishna Kanta Handiqui State Open University (KKHSOU), established under the provisions of the KKHSOU Act 2005 passed by the Assam State Legislature, extensively utilizes digital media tools and technologies to provide efficient and hassle-free student support services. The first and the only state open university of India's North East, it offers three major digital portals for users to access academic and administrative resources: the Learner's Portal, eBidya (Learning Management System), and the KKHSOU RTI Portal.

As the only state open university in Northeast India, KKHSOU is dedicated to delivering accessible, high-quality higher education and training through advanced educational technologies. It adopts a blended learning model that combines face-to-face and online learning methods. Learners receive a wide range of support services such as printed and digital self-learning materials, recordings of counselling sessions (shared on YouTube), video conferencing opportunities, online learning resources, library access, and more.

Key technology enabled platforms and services provided by KKHSOU -

a. Official Website (www.kkhsou.ac.in):

The official website of KKHSOU functions as an all-inclusive digital hub for students, offering detailed insights into various facets of the university. It encompasses sections on governance, academic schools, research initiatives, student services, examinations, study centres, eBidya (the Learning Management System), digital library, and a wide range of e-services.

- b. RTI** **Portal:**
To uphold transparency and accountability in line with the Right to Information (RTI) Act, 2005, KKHSOU operates a dedicated RTI portal that grants public access to key institutional information.
- c. Social Media** **Engagement:**
KKHSOU maintains a dynamic presence on platforms such as Twitter (@KKHSOU1), Facebook, YouTube, WhatsApp, and Telegram. These platforms are used to disseminate important academic and administrative announcements. Additionally, discipline-specific student groups have been created to support e-mentoring and foster academic interaction.
- d. Email Services:**
Email is used as a primary mode of direct communication between the university and its learners, ensuring timely responses to academic queries and concerns.
- e. Community Radio – Jnan Taranga:**
The university operates Jnan Taranga, a community radio service that broadcasts educational and socially relevant content to listeners within a 13 km radius. The station airs programmes on themes like women's empowerment, health, youth affairs, and employment opportunities.
- f. Mobile App:**
KKHSOU's official Android application, available on the Google Play Store (compatible with Android 2.3.6 and later versions), offers mobile access to university updates and services, thereby enhancing digital connectivity for learners.
- g. Digital Library System:**
The digital library acts as a global gateway to KKHSOU's academic resources, hosting a repository of teaching, learning, and research materials accessible from anywhere.

Beyond these platforms, KKHSOU has a comprehensive e-Office System in place designed to enhance and streamline digital interactions and administrative workflows. This structured platform facilitates efficient online operations across departments and ensure seamless communication among stakeholders.

The Online Leave Application Portal enables faculty and staff to apply for and manage leave requests digitally. Then there is the Circular Management System that allows for the creation, distribution, and archiving of official circulars in a centralized digital format. The Assignment Handling System supports the submission, tracking, and evaluation of academic assignments. The Grievance/Ticket Resolution System offers a structured approach to lodging, tracking, and resolving complaints or service requests. The User Profile Management maintains updated profiles for all stakeholders, enabling efficient record-keeping and user authentication. The eAdmit Card and eMarksheet Services facilitates the issuance and access of digital admit cards and mark sheets for students. The Payment Tracking and Reconciliation Module provides a secure system for monitoring payments and generating financial reports. The Learner Communication Interface ensures effective digital communication between the university and its learners through targeted messaging and updates. The Integrated Reporting Tools offers detailed reporting capabilities to support administrative decision-making and transparency.

When it comes to ICT Infrastructure, KKHSOU has established a comprehensive digital framework to support its distance education programs. This includes a Learning Management System (LMS) that serves as the primary platform for course delivery and management. Additionally, the university offers online audio-visual materials, mobile learning and a digital library, all designed to enhance the accessibility and quality of learning resources for its students.

As far as accessibility and outreach is concerned, the university has different study centres across the length and breadth of the region catering to the academic needs of numerous learners. Most of the centres also have digital learning centres in remote districts and offers offline content for students without consistent internet access. These centres act as local hubs where students can access educational content and support services. Recognizing that consistent internet access is not always available, the university also provides offline study materials, ensuring that students without reliable connectivity can continue their learning uninterrupted.

When it comes to the question of navigating through the digital media landscape, KKHSOU have time and again laid emphasis on the importance of digital literacy. The University organises workshops, online training programmes and produces tutorial videos on the lines of e-learning not just for the learners but for the faculty members as well. Such activities help the learners and faculty build digital competencies essential for navigating distance education platforms. In fact, these initiatives are crucial for enabling learners and educators to effectively use the digital platforms and tools required for distance education.

As far as the learner engagement strategies are concerned, KKHSOU offers courses in blended form, making use of both self-learning materials and online counselling.

There are different courses that integrate multimedia content, quizzes, self-assessment exercises, and discussion forums to foster active learning.

Communicating with the learners is of utmost importance as it helps to build a healthy learning atmosphere thereby reducing dropout rates. KKHSOU makes use of multi-channel communication system to maintain regular interaction with students through WhatsApp groups, SMS alerts, email and social media updates. This multi-channel approach helps keep students informed, connected, and motivated throughout their studies.

Learner support services forms a core component of any distance learning institution. Since learners under ODL mode are not in face to face contact with their instructors on a daily basis, so they require certain support services. These support services can be provided in the form of counselling classes, library facilities, online learning tools and platforms, study materials etc. KKHSOU have always strove to provide the best of academic and psychological support to its learners through its designated study centres. Recognizing the challenges faced by distance learners, KKHSOU offers support beyond academics. This includes online counselling services, live interactive classes, and mentoring programs. Such support systems aim to address both the educational and emotional needs of students, helping them stay focused and confident.

Data analysis, interpretation and key findings

This study employs a mixed method case study approach to examine the relationship between digital inclusion and learner engagement at KKHSOU. The case study method is well-suited for analyzing institutional practices, localized challenges, and policy responses within a specific socio-cultural context. As has already been mentioned, the research is based on both primary and secondary sources. A careful analysis (qualitative) of some of the best practices of the University was done by specifically focusing on the digital media component.

Purposive sampling method was used to select respondents who were actively involved in the university's distance learning process and had varying levels of digital access and literacy. This helped in understanding diverse perspectives and challenges related to digital inclusion and engagement. A survey consisting of a total of 383 learners was carried out from a few select study centres of KKHSOU situated in different designated areas of the state of Assam- Upper Assam, Middle Assam, Lower Assam, Barak Valley and Hills District. The sample profile consists of 174 (45.4%) BA learners, 129 (33.7%) MA learners and 80 (20.9%) Diploma learners. Out of all the learners, 52% were female while 48% were male.

A structured questionnaire was distributed using a mix of Likert-scale, multiple choice, and dichotomous (yes/no) questions. The first part of the questionnaire consisted of question related to digital inclusion while the second part consisted of questions related to learner engagement. Here, only a few pertinent questions related to the area under study have been highlighted for the benefit of all.

In the context of digital inclusion, the learners were asked as to whether they had regular access to a smartphone or computer for academic purposes. 321 (83.8%) of the learners replied in affirmative while the remaining 62 (16.2%) of them replied in negative. This has been indicated in the diagram given below-

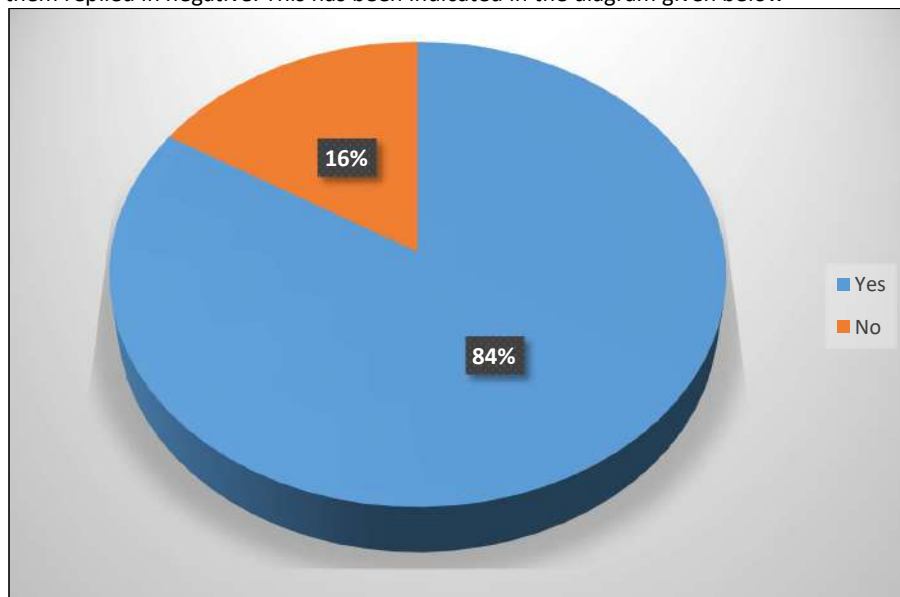


Fig – I : Diagram showing the percentage share of respondents indicating their accessibility to a smartphone or a computer

On being asked as to how often they face internet connectivity issues while accessing study materials, 112 (29.2%) said that they often face such problems, 145 (37.9%) said sometimes, 79 (20.6%) of them said rarely, 28 (7.3 %) of them said always while the remaining 19 (5.0%) said never have they faced any sort of network connectivity issues while accessing study materials. This has been shown in the diagram given below-

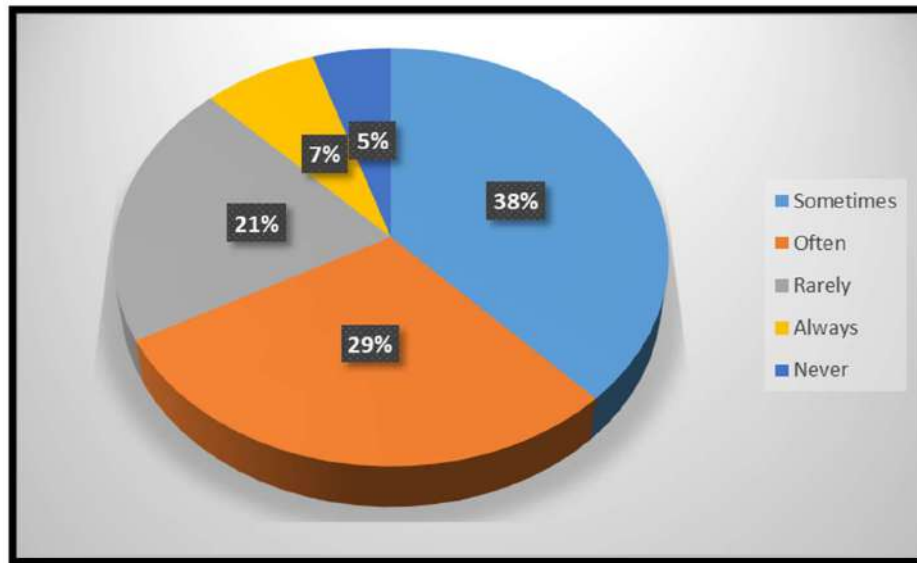


Fig – II : Diagram showing the percentage share of respondents indicating whether they face internet connectivity issues

On being asked as to from where they mostly access learning materials. 204 (53.3 %) of them have cited mobile network , 91 (23.8%) have pointed out broadband, 61 (15.9%) have said 'University Centre', while 27 (7.0%) have said that go to cyber cafe to access learning materials. This has been shown in the following diagram as given below-

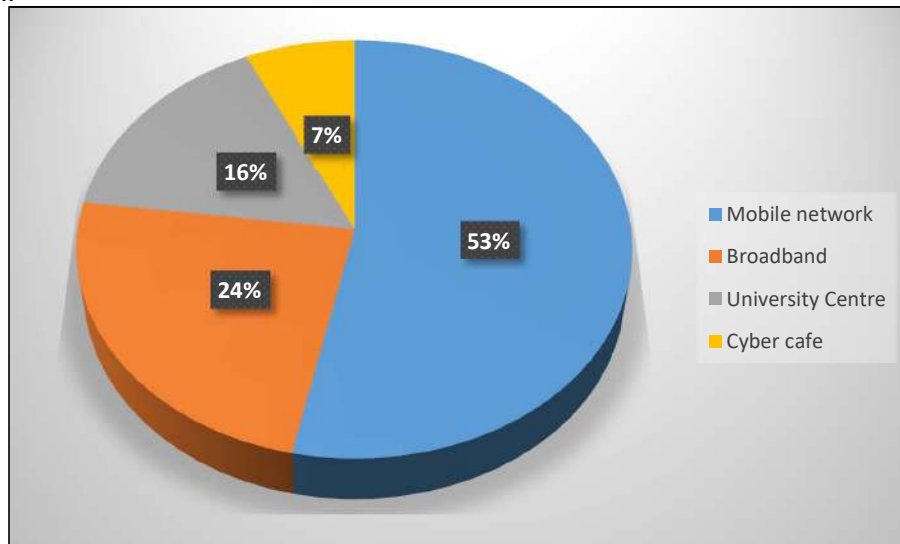


Fig – III : Diagram indicating the source from which the respondents mostly access their learning materials

Learners were also asked regarding their confidence level as far as utilisation of digital tools like LMS, Google Meet or Zoom is concerned. 139 (36.3%) of the learners said that they feel confident in using digital tools while 75 (19.6%) of the learners said that they feel very confident while using the tools. Another 94 (24.5%) of them remained neutral in this regard, 49 (12.8%) of them were less confident while utilising the digital tools . About 26 (6.8%) of the learners said that they were not that confident in using the digital tool. This has been shown in the diagram as given below-

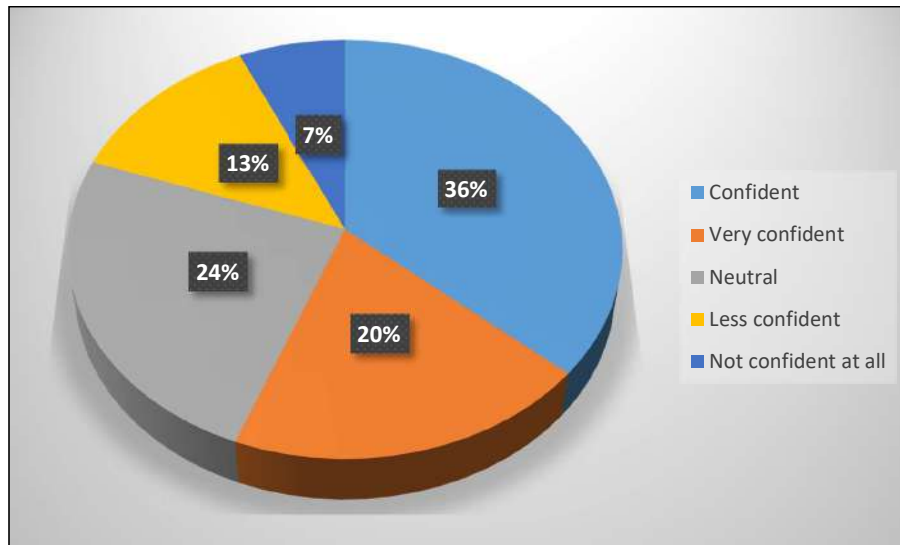


Fig – IV : Diagram indicating the confidence level of the respondents as far as the utilisation of digital tools is concerned

Now, coming to the second part of the questionnaire which was all about 'learner engagement'. In regard to the frequency of attending online classes or webinars organised by KKHSOU, 148 (38.6%) of them said that they often attend such classes or webinars, 121 (31.6%) learners said that they sometimes attended such classes or webinars, 54 (14.1%) learners said that they rarely attend, 42 (11 %) of them said that they always attend and the remaining 18 (4.7%) of them said that they never attend. This has been shown in the diagram given below-

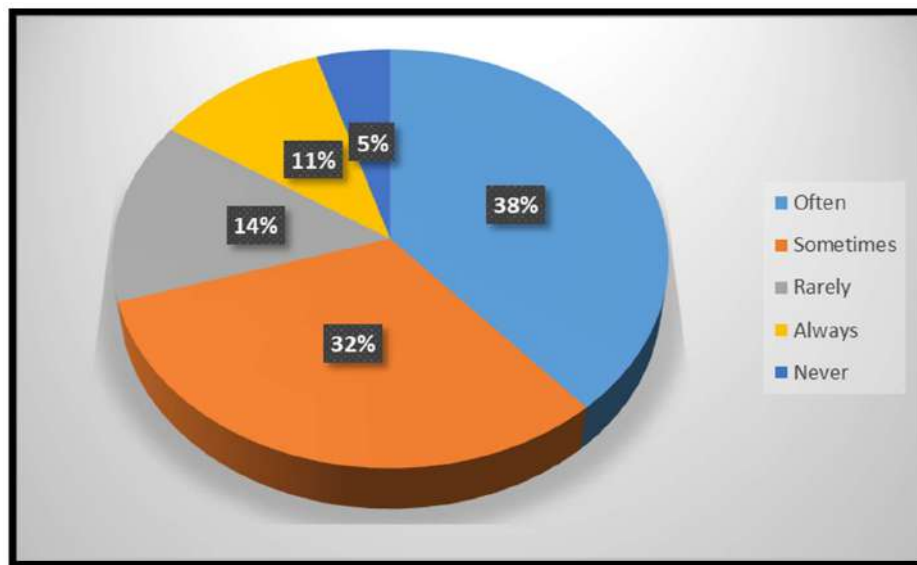


Fig – V : Diagram indicating the frequency of attending online classes or webinars by the respondents

On being asked if the learners participated in discussion forums or LMS based activities, 229 (59.8%) of them said that they actively participate while 154 (40.2%) of them that they do not participate in such forums or other activities. This has been shown in the diagram given below-

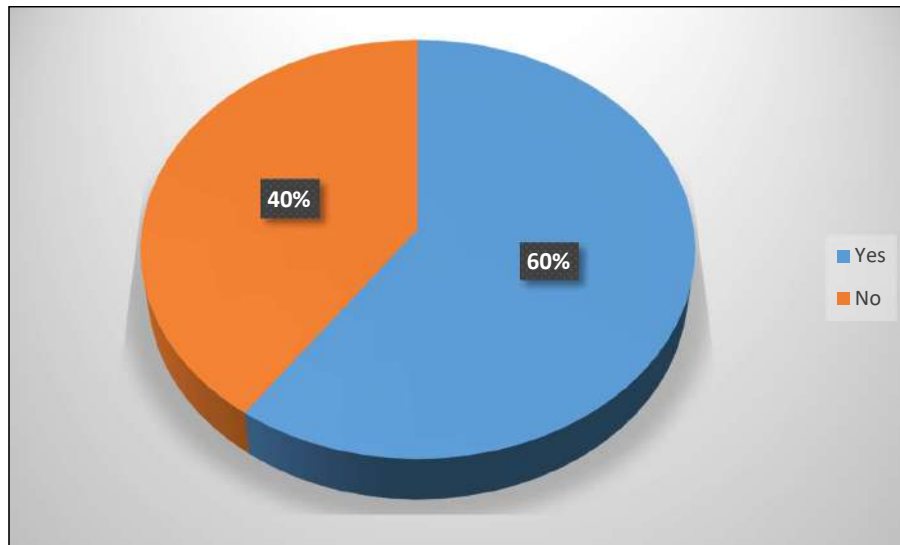


Fig – VI : Diagram showing the percentage share of respondents indicating their participation in discussion forums or LMS based activities

On being asked as to how motivated they feel to complete their academic tasks on time in the distance mode, 167 (43.6%) learners said that they feel motivated to do so while 79 (20.6%) of the learners said that they feel very much motivated to complete their tasks on time. 76 (19.8%) learners remained neutral in their reply while 44 (11.5%) and 17 (4.4%) of them said that they felt unmotivated and very unmotivated to complete their academic tasks on time in the ODL mode. This has been shown in the diagram given below-

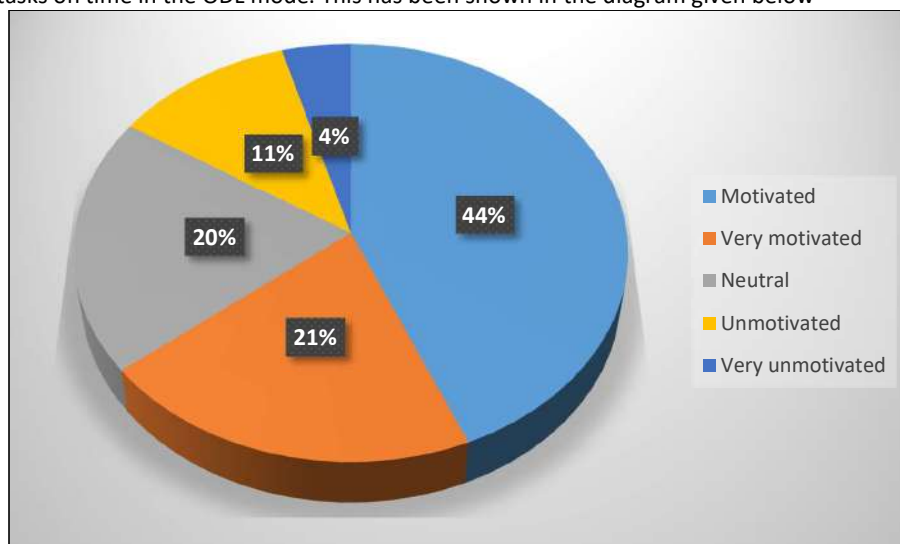


Fig – VII : Diagram showing the percentage share of respondents on how motivated they feel to complete their academic tasks on time

The learners were also asked if they ever felt connected to their instructors and peers through the university's digital platforms. 203 (53 %) respondents replied in affirmative while the remaining 180 (47%) of them replied in negative. This has been shown in the diagram given below-

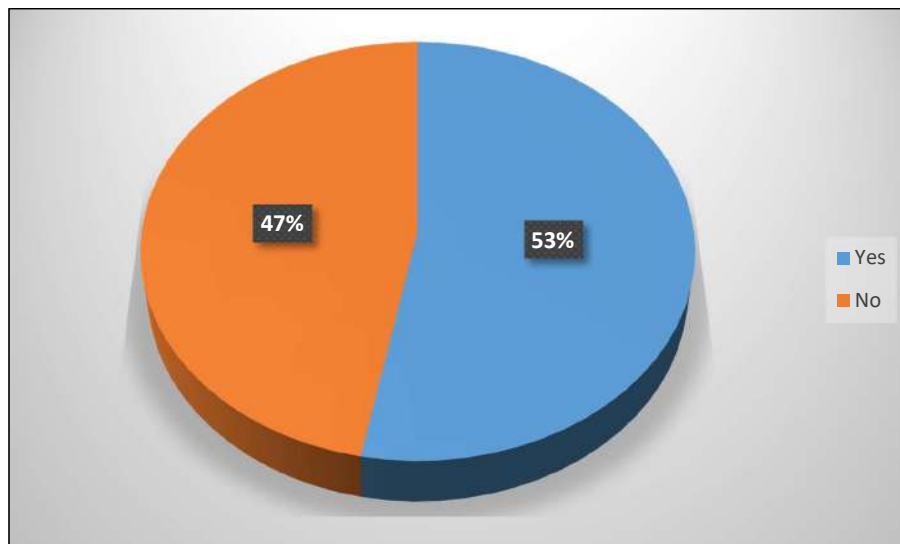


Fig – vii : Diagram showing percentage share of respondents on whether they felt connected to their instructors and peers through the university's digital platforms

The aforementioned data reveal that learners with better access to digital tools and stable internet are more engaged academically. However, a sizable proportion continues to face structural barriers, particularly from rural and low-income backgrounds.

Summary of findings and discussion

The study explored digital inclusion and learner engagement among students at KKHSOU, focusing on access to digital devices, internet connectivity, use of digital tools, and participation in online learning activities. We can summarise the findings under the following heads-

Digital Access and Connectivity:

The findings indicate that the majority of learners (321, 83.8%) have regular access to a smartphone or computer for academic purposes, suggesting that device availability is generally sufficient. However, internet connectivity remains a challenge: 112 learners (29.2%) reported facing connectivity issues often, and 28 learners (7.3%) said they always experience such problems. Most learners primarily rely on mobile networks (53.3%) to access study materials, with fewer using broadband (23.8%) or university centers (15.9%). A small percentage (7%) access learning materials via cyber cafes. These results highlight that while device access is high, network reliability and infrastructure continue to pose barriers, particularly for learners dependent on mobile networks.

Digital Literacy and Confidence:

In terms of digital literacy, 36.3% of learners reported feeling confident, and 19.6% felt very confident using digital tools such as LMS platforms, Google Meet, or Zoom. Around 24.5% were neutral, while 19.6% indicated low confidence. This indicates that while a majority of learners can use digital tools effectively, a notable portion still requires training and support to build confidence and competence in online learning environments.

Learner Engagement:

Engagement patterns show variability across students. Regarding attendance in online classes or webinars, 38.6% attend often, 31.6% sometimes, and 14.1% rarely, while only 11% always attend. Participation in discussion forums or LMS-based activities was reported by 59.8% of learners, leaving 40.2% non-participative. These findings suggest that active engagement is moderate, with a significant proportion of learners not fully utilizing interactive online opportunities.

Motivation levels were generally positive: 43.6% of learners feel motivated to complete tasks on time, and 20.6% feel very motivated. However, 19.8% remained neutral, and 15.9% reported low motivation, highlighting that sustaining engagement and self-regulation in distance education remains a challenge for some learners.

Peer and Faculty Connection:

Regarding the sense of connectedness, just over half of the respondents (53%) felt connected to instructors and peers through the university's digital platforms, while 47% reported feeling disconnected. This indicates that despite access to digital tools, online social presence and community-building remain areas requiring attention to enhance interaction and a sense of belonging among students.

Overall, the findings underscore that digital inclusion is high in terms of device access, but connectivity issues

and limited use of broadband networks create inequities in accessing learning resources. Moderate confidence in digital tools points to the need for training programs and orientation sessions to improve digital literacy. Learner engagement is varied, with higher participation in some areas (discussion forums) and lower in others (regular attendance at webinars), suggesting that engagement strategies need to be more inclusive, interactive, and motivating. Furthermore, the near-equal split in perceived connectedness highlights the need for stronger mechanisms to foster peer-to-peer and student-instructor interaction.

In summary, while KKHSOU students generally have access to digital resources and demonstrate basic competence in using online tools, connectivity, digital literacy gaps, engagement inconsistencies, and limited online interaction are key areas that need targeted interventions. Addressing these factors can improve overall learner engagement, motivation, and satisfaction in the ODL environment.

Challenges and Recommendations

In spite of the rapid advances being made in the field of open and distance learning, a lot of challenges remain. Ensuring meaningful digital participation in education requires more than just technological access. Several socio-economic and infrastructural barriers hinder learners, especially in marginalized communities, from fully engaging in the digital learning ecosystem.

- Many remote regions, particularly rural and tribal pockets, continue to suffer from weak or unreliable internet infrastructure. This severely limits learners' ability to access online resources or attend virtual classes regularly.
- Students from economically disadvantaged backgrounds often cannot afford smartphones, laptops, or data plans, widening the digital divide and limiting educational opportunities.
- First-generation students, who are the first in their families to pursue higher education, often lack prior exposure to digital tools and platforms. This unfamiliarity can lead to hesitation, reduced engagement and a sense of isolation in online learning environments.
- Many educators require continuous professional development to effectively teach in virtual modes. Lack of structured training in digital tools and e-pedagogical methods can affect the overall quality of instruction and learner engagement.

To overcome these challenges, it is recommended that KKHSOU should enter into an agreement with government bodies and telecommunications providers to offer affordable internet packages to students. The university should also initiate digital literacy programs in regional languages to reach a broader audience. Promoting offline and mobile-friendly educational content can further help students with limited internet access. Finally, building peer support networks and virtual student communities can enhance engagement and provide a supportive learning environment.

Conclusion

Thus, it can be concluded that digital inclusion and learner engagement are central to the effectiveness and success of distance education, particularly in the context of institutions like KKHSOU. Digital inclusion goes beyond mere access to devices and the internet; it encompasses the ability of learners to effectively use digital tools, navigate online learning platforms, and access educational resources without undue barriers. Ensuring equitable access to technology, reliable connectivity, and digital literacy training is therefore essential to enable all learners, including those from rural or marginalized backgrounds, to participate meaningfully in distance learning.

At the same time, learner engagement is critical for translating access into academic success. Engagement involves active participation in online classes, discussion forums, and collaborative learning activities, as well as maintaining motivation to complete assignments and interact with peers and instructors. Without engagement, the potential benefits of digital inclusion remain underutilized, and learners may struggle to achieve intended learning outcomes. When digital inclusion and learner engagement are combined, they foster a learning ecosystem that is not only accessible but also interactive, inclusive, and impactful. A digitally inclusive environment ensures that learners have the tools to participate, while engagement strategies ensure that these tools are used effectively for meaningful learning. The interplay of these two factors contributes to improved academic performance, enhanced learner satisfaction, and the development of self-directed learning skills—qualities that are particularly important in the ODL context.

Furthermore, promoting digital inclusion and engagement has broader implications beyond individual learning outcomes. It can enhance equity in education, reduce disparities among learners from different socio-economic backgrounds, and strengthen the overall effectiveness of distance education programs. Institutions like KKHSOU can leverage these insights to design targeted interventions, such as digital literacy workshops, interactive online modules, mentorship programs, and community-building initiatives, to create a supportive and participatory learning environment. In conclusion, the integration of digital inclusion and learner engagement forms the

foundation of a robust distance education system. By ensuring equitable access to technology and fostering active, sustained participation, ODL institutions can create an environment that is not only accessible and inclusive but also empowering, learner-centered, and capable of producing meaningful educational outcomes. The findings of this study underscore the importance of continuous investment in both technological infrastructure and engagement strategies to realize the full potential of distance education in the contemporary digital age.

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