Indian Journal of Adult Education **87 (1) 2026, 75-92**
https://www.iaea-india.in
ISSN 0019-5006

Digital Readiness in Adult Education: Identifying Challenges among Postgraduate Distance Education Learners

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Abstract

Digital readiness in adult education refers to the preparedness of learners to effectively access, use, and apply digital technologies for learning and professional development. The present study aimed (i) to assess the level of digital readiness among postgraduate distance education learners in the context of adult education, and (ii) to identify the major challenges faced by them in developing and applying digital literacy skills. The study followed the descriptive survey method, and data were collected from 110 postgraduate distance learners of the Study Centre of Dukhulal Nibaran Chandra College, Aurangabad, Murshidabad under Netaji Subhas Open University, West Bengal, using a self-constructed 5-point Likert scale with a reliability coefficient of 0.74 (Cronbach's Alpha). The findings revealed that the learners possessed moderate to high digital readiness, particularly in basic computer and communication skills, but faced significant challenges related to limited internet access, inadequate institutional support, low confidence, and difficulty in managing digital content. The study implies that enhancing digital readiness through institutional training programmes, infrastructure improvement, and continuous learner support is essential to strengthen digital inclusion and promote effective lifelong learning in adult education.

Keywords: *adult education, challenges, digital readiness, distance learning.*

Introduction

In the contemporary era of digital transformation, the education sector has witnessed a paradigm shift towards technology-mediated learning environments. Adult learners, particularly those enrolled in postgraduate distance education programmes, have increasingly become dependent on digital platforms to access, process, and apply academic content. Digital readiness—comprising digital literacy, technological competence, and self-efficacy—plays a crucial role in ensuring effective participation in these learning environments (Getenet et al., 2024; Inan Karagul et

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al., 2021). The transition from traditional classroom instruction to digital modes of delivery requires adult learners to possess a multifaceted set of digital skills and attitudes that enable them to adapt to evolving online learning contexts (Marin & Castaneda, 2023).

Adult learners often face distinctive challenges in developing digital competencies, owing to varied socio-economic backgrounds, prior educational experiences, and levels of exposure to technology. Studies have revealed that many adult distance learners experience limitations in accessing adequate technological resources, digital tools, and reliable internet connectivity, which in turn hinders their engagement and performance in online education (Durgunoglu et al., 2022; Kara et al., 2019). Moreover, the lack of institutional support, insufficient training opportunities, and low digital confidence further exacerbate the digital divide in adult education (Richard & Musa, 2024).

In India, open and distance learning (ODL) has expanded significantly, offering higher education opportunities to diverse groups of learners, including those from rural and marginalised communities. However, the digital readiness of such learners, especially at the postgraduate level, remains a critical issue. Research conducted across various universities indicates that postgraduate learners demonstrate varying levels of digital literacy and information management capabilities, which affect their ability to effectively engage in online learning environments (Boro et al., 2023; Diksha & Sharma, 2024). The findings of Kulusakli (2024) and Nawi et al. (2023) further emphasise that postgraduate distance learners' success depends not only on access to digital tools but also on their competence in using them for academic and communicative purposes.

Additionally, digital literacy has been found to influence learners' motivation, cognitive engagement, and overall academic outcomes in virtual learning settings (Karakýþ, 2022). Inadequate digital preparedness may lead to frustration, low confidence, and withdrawal from online learning experiences, particularly among adult learners balancing academic, professional, and personal responsibilities. As highlighted by Kara et al. (2019), addressing these barriers requires a deeper understanding of the learners' digital readiness levels and the contextual challenges they encounter.

Given this background, the present study aims to assess the level of digital readiness among postgraduate distance education learners in the context of adult education and to identify the major challenges they face in developing and applying

digital literacy skills. Understanding these aspects will not only contribute to enhancing adult learning experiences but also inform institutional strategies for digital capacity building and learner support within distance education systems.

Review of Related Literature

The concept of digital readiness has emerged as a central component in the discourse of open and distance learning (ODL), especially within adult education. It encompasses learners' ability to effectively engage with digital technologies, demonstrate digital literacy, and utilise digital platforms for academic and professional growth. As education systems increasingly rely on online and blended modes of delivery, understanding learners' digital competencies and related challenges has become vital to ensuring equitable access and participation.

Digital literacy forms the foundation of digital readiness. Marin and Castaneda (2023) emphasised that digital literacy involves not only technical proficiency but also the critical and pedagogical capacity to employ technology for teaching and learning. They argued that fostering digital literacy among learners and educators alike is crucial for enhancing the quality of open and digital education. Supporting this view, Inan Karagul et al. (2021) explored students' digital literacy levels during the COVID-19 pandemic and found that learners' success in online education is closely linked to their self-efficacy, motivation, and adaptability in using digital tools.

In the context of higher education, several studies have identified significant variability in learners' digital competence. Boro et al. (2023) investigated digital literacy skills among postgraduate students across selected Central Universities of North East India and revealed moderate proficiency levels, indicating a pressing need for digital skill enhancement programmes. Similarly, Diksha and Sharma (2024) examined information literacy among distance learners at the University of Jammu and concluded that while learners possess basic ICT knowledge, many lack advanced skills in digital resource evaluation, data handling, and academic communication in virtual environments. These findings underscore the uneven digital preparedness among postgraduate distance learners in India.

Adult learners often face additional challenges that differentiate them from traditional university students. Kara et al. (2019), through an extensive literature review, highlighted that adult learners in online distance education experience multiple barriers such as limited technological experience, poor internet access, time management issues, and balancing personal and professional responsibilities.

Durgunoglu et al. (2022) further discussed the difficulties faced by adult learners during the transition to remote learning, particularly emphasising the scarcity of technological resources, institutional support, and digital confidence. These factors collectively hinder adult learners' participation and performance in online education.

Motivation and engagement are also crucial aspects influencing digital readiness. Karakýþ (2022) analysed the relationship between digital literacy and online learning motivation, noting that learners with higher levels of digital competence displayed stronger intrinsic motivation and better engagement in digital learning tasks. This suggests that digital literacy not only enhances technical capability but also supports learners' emotional and psychological readiness for online education.

Kulusakli (2024) examined the basic digital competencies of distance learners in higher education and identified significant gaps in digital communication, content creation, and problem-solving skills. The study recommended that institutions integrate targeted training and digital support systems to bridge these gaps. Similarly, Nawi et al. (2023) focused on postgraduate students' digital literacy competence for online reading and found that comprehension, navigation, and critical analysis of digital texts require a distinct set of literacy skills beyond traditional reading abilities.

Moreover, research on digital readiness extends to the competencies of educators who facilitate adult learning. Richard and Musa (2024) proposed an ODL educators' competency framework emphasising the alignment of pedagogical expertise with digital proficiency. They argued that the effectiveness of adult education in digital environments depends on both learner and educator readiness, as the latter plays a pivotal role in designing inclusive and supportive online learning experiences.

The interplay between learners' attitudes, digital literacy, and online learning engagement has also been examined by Getenet et al. (2024), who found that positive attitudes toward technology and higher levels of self-efficacy significantly enhance learners' engagement and persistence in online learning. This reinforces the view that digital readiness is a multidimensional construct that includes cognitive, affective, and behavioural elements essential for success in distance learning contexts.

In summary, the reviewed studies collectively suggest that while postgraduate and adult learners increasingly rely on digital tools for educational advancement, many continue to face challenges related to access, competence, confidence, and institutional support. The literature reveals a consistent call for systematic interventions to strengthen digital literacy training, improve access to technological resources, and foster supportive online learning ecosystems. Against this background, the present

study seeks to assess the level of digital readiness among postgraduate distance education learners and to identify the key challenges they face in developing and applying digital literacy skills within the context of adult education.

Rationale of the Study

In the age of rapid technological advancement, digital readiness has become a prerequisite for effective participation in higher education, particularly in distance and open learning systems. Adult learners pursuing postgraduate programmes through distance education are increasingly expected to demonstrate digital competence to engage with online resources, communicate effectively in virtual environments, and complete academic tasks independently. However, the degree to which these learners possess the necessary digital literacy skills and confidence remains a pressing concern in the field of adult education (Kara et al., 2019; Richard & Musa, 2024).

Digital readiness encompasses a combination of technological access, digital literacy, and self-efficacy—key factors that determine learners' ability to adapt to technology-enhanced learning environments (Getenet et al., 2024). The COVID-19 pandemic accelerated the shift to digital and remote modes of instruction, highlighting both opportunities and inequalities in learners' digital capabilities (Inan Karagul et al., 2021; Durgunoglu et al., 2022). For adult learners, who often juggle multiple responsibilities such as employment and family obligations, the transition to digital platforms can present unique barriers. These include limited exposure to modern technologies, inconsistent internet access, and inadequate institutional support for developing digital skills (Kara et al., 2019; Durgunoglu et al., 2022).

In the Indian context, the expansion of open and distance learning (ODL) has made higher education more accessible to diverse learner groups, including those from rural and underprivileged backgrounds. However, research indicates persistent disparities in the digital preparedness of postgraduate distance learners. For instance, Boro et al. (2023) found that postgraduate students in Northeast India demonstrated only moderate levels of digital literacy, suggesting the need for institutional interventions to strengthen their technological proficiency. Similarly, Diksha and Sharma (2024) reported that distance learners possess basic information literacy but struggle with advanced digital research and communication skills, which are essential for postgraduate-level study.

Furthermore, Kulusakli (2024) emphasised that digital competence in higher education must go beyond operational skills to include the ability to communicate, collaborate, and create digital content effectively. Nawi et al. (2023) also highlighted

that postgraduate students' online reading and comprehension abilities are strongly influenced by their overall digital literacy, which affects their academic engagement and performance. These studies collectively point to a critical need for assessing and enhancing the digital readiness of adult learners in distance education programmes.

At the same time, motivation and attitude toward technology play a substantial role in determining learners' readiness to adopt digital learning strategies. Karakýþ (2022) demonstrated that students with higher digital literacy levels tend to exhibit stronger motivation and persistence in online learning environments. Marin and Castaneda (2023) also noted that developing digital literacy is not merely about technological proficiency but involves cultivating positive attitudes, reflective thinking, and the ability to integrate technology meaningfully into the learning process.

Despite the growing body of international literature, there remains a gap in research focusing on the digital readiness of adult postgraduate learners in the Indian distance education context, particularly within regional institutions such as those affiliated with Netaji Subhas Open University. Understanding the existing level of digital competence and identifying the challenges faced by these learners are essential steps toward designing effective digital inclusion strategies and learner support frameworks.

Therefore, this study seeks to assess the level of digital readiness among postgraduate distance education learners and to identify the key challenges they face in developing and applying digital literacy skills. The findings are expected to contribute to the body of knowledge on adult digital education and inform policies and practices aimed at enhancing digital equity and effectiveness in distance education systems.

Objectives

1. To assess the level of digital readiness among postgraduate distance education learners in the context of adult education.
2. To identify the major challenges faced by postgraduate distance education learners in developing and applying digital literacy skills.

Research Questions

1. What is the level of digital readiness among postgraduate distance education learners in the context of adult education?

2. What are the major challenges faced by postgraduate distance education learners in developing and applying digital literacy skills?

Methodology of the Study

1. Research Method

The present study followed the descriptive survey method to assess the level of digital readiness among postgraduate distance education learners and to identify the major challenges faced by them in developing and applying digital literacy skills. The descriptive survey design was considered appropriate, as it allows the collection of quantitative data from a defined population to describe existing conditions, attitudes, and competencies. The investigator collected the data through a 5-point scale developed on Google Form, which was distributed digitally among the selected participants. This method was chosen to ensure accessibility and convenience for distance learners who were already accustomed to online communication platforms.

2. Population and Sample

The population of the study consisted of adult learners enrolled in postgraduate (PG) programmes through distance education under the Netaji Subhas Open University (NSOU), West Bengal. From this population, a sample of 110 adult learners was selected from the Study Centre of Dukhulal Nibaran Chandra College, Aurangabad, Murshidabad. The participants represented diverse academic disciplines, age groups, and professional backgrounds, reflecting the heterogeneous nature of adult learners in distance education settings. A purposive sampling technique was employed to select learners who were actively engaged in digital learning environments.

3. Tool Used

To collect the data, the researcher utilised a self-constructed 5-point scale designed to measure the digital readiness of adult postgraduate learners. The scale consisted of items focusing on two main dimensions:

- Level of digital readiness among postgraduate distance education learners in the context of adult education.
- Major challenges faced by postgraduate distance education learners in developing and applying digital literacy skills.

The responses were recorded on a 5-point Likert scale ranging from Strongly Agree (5) to Strongly Disagree (1).

4. Reliability of the Tool

The internal reliability of the self-constructed 5-point scale was evaluated through Cronbach's Alpha test. The obtained reliability coefficient was 0.74, indicating a high level of internal consistency and suggesting that the items on the scale reliably measured the same underlying construct of digital readiness. This reliability score meets the generally accepted standards for educational and psychological research instruments.

5. Validity of the Tool

The content validity of the scale was established through expert evaluation. The draft version of the tool was reviewed by a panel of five experts in the fields of Educational Technology, Distance Education, and Educational Research. Their suggestions were incorporated to refine the wording, structure, and clarity of the items. This process ensured that the scale items adequately represented the dimensions of digital readiness relevant to adult postgraduate learners.

6. Data Collection Procedure

The final tool was administered online using Google Forms to facilitate easy participation and response submission. The investigator shared the survey link via email and WhatsApp groups associated with the NSOU Study Centre. Participation was voluntary, and respondents were assured of anonymity and confidentiality. Data were automatically recorded through Google Forms and later exported to Microsoft Excel and SPSS for statistical analysis.

7. Data Analysis

Statistical technique, like percentage analysis, was used to assess the level of digital readiness and identify challenges faced by the adult learners. The responses were also analysed dimension-wise.

Analysis and Interpretation

The data collected using the self-constructed 5-point Likert scale were analysed through percentage analysis to determine the level of digital readiness and the major challenges faced by postgraduate distance education learners. Each item was classified according to the Likert responses: Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), Strongly Disagree (SD). The findings are presented under the two main objectives of the study.

Table 1: Level of Digital Readiness among Postgraduate Distance Education Learners (N = 110).

Indicators of Digital Readiness	SA (F/%)	A (F/%)	N (F/%)	D (F/%)	SD (F/%)	Interpretation
Basic computer and internet operation skills	55 (50%)	30 (27.3%)	5 (4.5%)	15 (13.7%)	5 (4.5%)	High
Use of Learning Management Systems (LMS)	8 (7.3%)	10 (9.1%)	7 (6.3%)	55 (50%)	30 (27.3%)	Low
Use of email, chat, and video conferencing	60 (54.6)	20 (18.2%)	3 (2.7%)	14 (12.7%)	13 (11.8%)	High
Ability to create and share digital content	52 (47.3%)	22 (20%)	5 (4.5%)	16 (14.5%)	15 (13.7%)	High
Ability to manage data and online information	10 (9.1%)	43 (39.1%)	8 (7.3%)	30 (27.3%)	19 (17.2%)	Moderate
Awareness of cyber security and online ethics	32 (29.1%)	20 (18.2%)	11 (10%)	27 (24.5%)	20 (18.2%)	Moderate
Confidence in using new digital tools	30 (27.3%)	19 (17.2%)	16 (14.6%)	25 (22.7%)	20 (18.2%)	Moderate
Overall Digital Readiness	35 (31.8%)	23 (20.9%)	8 (7.3%)	26 (23.6%)	18 (16.4%)	Moderate to High

Table 1 presents the percentage distribution of responses on various indicators of digital readiness among postgraduate distance education learners. The analysis reveals that a majority of learners possess basic computer and internet operational skills (77.3% SA+A), and a substantial proportion are confident in using email, chat, and video conferencing tools (72.8% SA+A). These findings indicate that adult learners are largely comfortable with the fundamental and communicative aspects of digital learning environments.

However, a significant proportion of learners demonstrated low proficiency in using Learning Management Systems (LMS), with 77.3% (D+SD) indicating difficulty in effectively navigating these platforms. This suggests a notable gap between general digital use and academic digital engagement. Furthermore, while learners show a high ability to create and share digital content (67.3% SA+A), they exhibit moderate readiness in managing data and online information (48.2% SA+A) and awareness of cyber security and online ethics (47.3% SA+A).

Overall, the findings indicate that postgraduate distance learners possess moderate to high levels of digital readiness, with particular strengths in basic operational and communication skills but clear limitations in the use of institutional LMS platforms, data management, and cyber security awareness. These gaps highlight areas where targeted digital literacy training is essential to improve academic digital competence and responsible online behaviour.

Table 2: Major Challenges Faced in Developing Digital Literacy Skills (N = 110).

Challenges Identified	SA (F/%)	A (F/%)	N (F/%)	D (F/%)	SD (F/%)	Interpretation
Limited access to digital devices	30 (27.3%)	25 (22.7%)	10 (9.1%)	16 (14.5%)	29 (26.4%)	Moderate
Unstable or low-speed internet	40 (36.4%)	25 (22.7%)	8 (7.3%)	12 (10.9%)	25 (22.7%)	High
Lack of prior exposure to online tools	55 (50%)	10 (9.1%)	8 (7.3%)	21 (19.1%)	16 (14.5%)	High
Low confidence/digital self-efficacy	25 (22.7%)	20 (18.2%)	14 (12.7%)	30 (27.3%)	21 (19.1%)	Moderate
Difficulty adapting to new digital platforms	30 (27.3%)	20 (18.2%)	14 (12.7%)	26 (23.6%)	20 (18.2%)	Moderate
Overall	36 (32.7%)	20 (18.2%)	11 (10%)	21 (19.1%)	22 (20%)	Moderate to High

Table 2 presents the major challenges encountered by postgraduate distance learners in developing their digital literacy skills. The results show that lack of prior exposure to online tools (59.1% SA+A) and unstable or low-speed internet connectivity (59.1% SA+A) are the most prominent barriers, followed by limited access to digital devices (50% SA+A). These findings point toward infrastructural and experiential limitations that hinder learners' ability to develop digital proficiency effectively.

In addition, learners reported moderate challenges in terms of low confidence or digital self-efficacy (40.9% SA+A) and difficulty adapting to new digital platforms (45.5% SA+A). This suggests that many adult learners experience psychological barriers, such as anxiety or uncertainty, when engaging with unfamiliar digital systems.

The overall interpretation indicates that while infrastructural challenges—such as device accessibility and internet stability—are significant external barriers, psychological readiness and adaptability also play crucial roles in the development

of digital literacy. The findings underscore the need for institutional interventions, such as digital skill orientation programmes and continuous technical support, to help adult learners build both confidence and competence in using digital technologies.

Table 3: Major Challenges Faced in Applying Digital Literacy Skills (N = 110).

Challenges Identified	SA (F/%)	A (F/%)	N (F/%)	D (F/%)	SD (F/%)	Interpretation
Time constraints due to professional/family responsibilities	70 (63.6%)	30 (27.3%)	1 (0.9%)	4 (3.7%)	5 (4.5%)	High
Lack of institutional technical support	28 (25.5%)	20 (18.2%)	15 (13.6%)	27 (24.5%)	20 (18.2%)	Moderate
Difficulty managing online information and content	25 (22.7%)	30 (27.3%)	10 (9.1%)	30 (27.3%)	15 (13.6%)	Moderate
Limited collaborative opportunities in digital learning	20 (18.2%)	30 (27.3%)	5 (4.5%)	35 (31.8%)	20 (18.2%)	Moderate
Low confidence in implementing digital tools in assignments/projects	25 (22.7%)	20 (18.2%)	15 (13.6%)	30 (27.3%)	20 (18.2%)	Moderate
Overall	34 (30.9%)	26 (23.6%)	9 (8.2%)	25 (22.7%)	16 (14.6%)	Moderate to High

Table 3 highlights the challenges faced by postgraduate distance learners in the application of digital literacy skills within their learning environments. The most significant challenge reported was time constraints due to professional and family responsibilities (90.9% SA+A), indicating that adult learners often struggle to balance academic and personal commitments, which restricts their ability to apply digital skills effectively.

Other notable challenges include lack of institutional technical support (43.7% SA+A) and difficulty managing online information and content (50% SA+A), which reflect systemic and cognitive barriers to digital engagement. Moreover, limited collaborative opportunities in digital learning (45.5% SA+A) and low confidence in applying digital tools in assignments or projects (40.9% SA+A) further indicate that many learners are not fully equipped or supported to integrate digital tools into practical academic work.

The overall interpretation suggests that while adult learners possess a basic level of digital readiness, their application of these skills is constrained by external factors (time and support) and internal factors (confidence and collaboration). The findings emphasise the importance of developing flexible digital learning environments, enhancing institutional technical support systems, and promoting peer collaboration opportunities to ensure that digital literacy is effectively translated into productive academic practices.

Overall Analytical Summary

Across the three dimensions analysed, the study reveals that postgraduate distance education learners show moderate to high digital readiness but continue to face substantial challenges in both developing and applying digital literacy skills. Structural limitations (e.g., internet connectivity, device access) and personal constraints (e.g., time, confidence) remain significant barriers. Addressing these through targeted capacity-building initiatives, improved technical infrastructure, and learner support mechanisms can enhance digital inclusivity and empowerment in adult education contexts.

Findings of the Study

The present study aimed to assess the level of digital readiness among postgraduate distance education learners and to identify the major challenges faced by them in developing and applying digital literacy skills in the context of adult education. Based on the analysis and interpretation of data, the following findings were derived:

1. Findings Related to the Level of Digital Readiness

(i) A majority of postgraduate distance learners demonstrated adequate proficiency in basic computer and internet operation skills, with 77.3% respondents agreeing or strongly agreeing that they could perform routine digital tasks effectively.

(ii) A substantial proportion (72.8%) also expressed confidence in using email, chat, and video conferencing tools, indicating a high level of familiarity with communication technologies.

(iii) However, a significant number of learners (77.3%) reported low competence in using Learning Management Systems (LMS), suggesting a lack of familiarity with structured online learning environments.

(iv) Around 67.3% of learners indicated that they were able to create and share

digital content, reflecting a moderately high degree of creativity and engagement in digital spaces.

(v) The ability to manage data and online information and awareness of cyber security and online ethics were found to be at a moderate level, revealing partial understanding and skill in critical digital areas.

(vi) Learners' confidence in using new digital tools was also moderate, indicating the need for regular digital skill enhancement programmes.

(vii) Overall, the findings suggest that the digital readiness of postgraduate distance learners is moderate to high, with strengths in basic operational and communication skills but clear gaps in advanced digital competencies and online learning management.

2. Findings Related to the Challenges in Developing Digital Literacy Skills

(i) The study found that limited access to digital devices and unstable or low-speed internet connectivity were among the most frequently cited challenges, affecting 50–60% of the respondents.

(ii) About 59.1% of learners lacked prior exposure to online tools, indicating that foundational digital training remains insufficient in many adult education settings.

(iii) A considerable number of learners (40.9%) reported low confidence and digital self-efficacy, which hindered their motivation to experiment with or adopt new technologies.

(iv) Difficulty in adapting to new digital platforms was also identified as a moderate challenge, reflecting a need for structured orientation and hands-on training programmes.

(v) Overall, the findings highlight that infrastructural limitations and low digital confidence are the most critical barriers in the development of digital literacy skills among postgraduate distance learners.

3. Findings Related to the Challenges in Applying Digital Literacy Skills

(i) A large majority of respondents (90.9%) agreed that time constraints due to professional and family responsibilities made it difficult to apply their digital skills effectively in academic tasks.

(ii) Lack of institutional technical support was reported by 43.7% of learners, indicating inadequate infrastructural and administrative assistance for distance learners.

(iii) Learners also faced challenges in managing online information and digital

content (50%), which points toward difficulties in critical digital thinking and information organisation.

(iv) Limited opportunities for online collaboration and low confidence in applying digital tools in assignments or projects were reported as moderate barriers by approximately 45–50% of respondents.

(v) On the whole, the findings suggest that external constraints (time, support systems) and internal factors (confidence, practice) jointly restrict the effective application of digital literacy skills among adult postgraduate learners.

4. Overall Findings

(i) The study concludes that the digital readiness of postgraduate distance education learners is moderate to high, with stronger performance in fundamental digital operations and communication but lower mastery of structured online learning and cyber security practices.

(ii) The primary challenges in developing digital literacy are infrastructural and experiential — such as limited device access, poor internet connectivity, and lack of digital exposure.

(iii) The main barriers in applying digital literacy are personal and institutional — including time constraints, insufficient technical support, and low confidence in implementing digital tools.

(iv) These findings emphasise the urgent need for targeted digital skill training, technical infrastructure development, and continuous mentoring for adult learners pursuing postgraduate distance education.

Discussion

The findings of the present study provide valuable insights into the digital readiness and challenges experienced by postgraduate distance education learners in the context of adult education. The results revealed that while most learners possess a satisfactory level of basic digital competency, significant disparities exist in their ability to use advanced tools, manage online learning systems, and apply digital literacy skills effectively. These findings resonate with global research trends emphasising the uneven digital preparedness of adult learners across higher education and distance learning environments (Boro et al., 2023; Kulusakli, 2024).

The study found that learners demonstrated high proficiency in basic computer and internet operations, email communication, and video conferencing. This aligns with Getenet et al. (2024), who observed that learners' familiarity with everyday digital tools positively influences their online learning engagement and self-efficacy.

However, the low competence reported in using Learning Management Systems (LMS) suggests that many distance learners still rely primarily on basic platforms rather than integrated digital learning ecosystems. This finding supports Kara et al. (2019), who noted that adult learners in distance education often struggle with the technical and procedural aspects of structured online learning.

Moderate awareness of cybersecurity and online ethics also emerged as a concern. Inan Karagul et al. (2021) similarly reported that many university students lack adequate understanding of safe digital practices, emphasising the need for targeted training in responsible digital engagement. The moderate level of confidence in using new tools further highlights the need for sustained capacity-building initiatives that can enhance digital adaptability among adult learners.

In terms of challenges, the findings revealed that infrastructural barriers such as unstable internet connections and limited access to digital devices continue to impede effective learning. This supports the observations of Durgunoglu et al. (2022), who found that inadequate technological resources significantly affect the success of remote learning in adult education. Similarly, the lack of prior exposure to online tools indicates that a considerable portion of adult learners enter distance programmes without sufficient digital foundation—consistent with the findings of Diksha and Sharma (2024), who reported that information literacy among distance learners remains limited despite the growing digitalisation of education.

Furthermore, challenges related to time constraints and competing professional or family responsibilities were among the most dominant factors influencing the application of digital literacy skills. This is consistent with Marin and Castaneda (2023), who emphasised that adult learners' engagement with digital platforms is often moderated by contextual factors such as workload, familial obligations, and institutional support systems. The study by Richard and Musa (2024) also supports this observation, suggesting that adult learners' digital engagement depends not only on individual readiness but also on the competencies of educators and the quality of institutional facilitation.

The moderate confidence and limited opportunities for digital collaboration identified in this study echo the findings of Karakýþ (2022), who demonstrated that learners' motivation and active participation in online environments are closely linked to their digital literacy levels and self-efficacy. The lack of sufficient institutional technical support observed among the respondents further strengthens the argument that digital readiness is not solely an individual attribute but a systemic condition that requires coordinated institutional effort.

Overall, the findings of the present study suggest that while postgraduate distance learners possess a reasonable degree of digital readiness, their digital literacy development and application are hindered by infrastructural, psychological, and contextual barriers. Enhancing digital readiness, therefore, demands a holistic approach that integrates access to infrastructure, digital training, motivational strategies, and sustained institutional support.

These findings contribute to the growing discourse on digital inclusion and equity in adult and distance education. They reaffirm the need for educational institutions to re-evaluate their digital education policies and to invest in comprehensive digital literacy programmes tailored specifically for adult learners. Such initiatives can foster a culture of lifelong learning, empower adult students to navigate digital spaces effectively, and strengthen their engagement and success in open and distance learning environments.

Educational Implications

The findings of the present study hold significant implications for adult education and distance learning systems. First, it emphasises the urgent need to strengthen digital literacy training among postgraduate distance learners. Institutions like Netaji Subhas Open University and its study centres should incorporate structured digital readiness programmes that include skill-based workshops on online learning tools, digital collaboration platforms, and cyber security awareness. Educators must be provided with adequate professional development opportunities to guide adult learners effectively in digital environments. Moreover, curriculum designers should embed digital competence as a core learning outcome to enhance learner autonomy, engagement, and self-efficacy. Institutional support systems—such as digital help desks, peer mentoring, and accessible ICT infrastructure—should be strengthened to bridge digital divides and foster equitable participation in online learning.

Limitations of the Study

Although the study provides valuable insights into digital readiness and associated challenges, it is not without limitations.

1. The sample was restricted to 110 postgraduate distance learners from a single study centre (Dukhulal Nibaran Chandra College, Aurangabad, Murshidabad) under Netaji Subhas Open University, which may limit the generalisability of findings to other regions or institutions.

2. The study relied primarily on self-reported data, which might include subjective biases in learners' responses.

3. Furthermore, the research employed a descriptive design using a Likert-scale questionnaire without qualitative triangulation, which limits deeper understanding of learners' lived experiences and contextual barriers.

Future research may address these limitations by adopting mixed-method approaches and involving larger, more diverse samples across multiple institutions.

Conclusion

The present study reveals that while a majority of postgraduate distance education learners exhibit moderate to high levels of digital readiness, significant gaps persist in areas such as online collaboration, problem-solving in digital contexts, and use of advanced digital tools. Major challenges identified include limited access to reliable internet connectivity, lack of institutional training support, and difficulties in integrating digital skills into academic practices. These findings highlight that digital readiness in adult education extends beyond technical proficiency—it involves motivation, adaptability, and sustained institutional support. To truly empower adult learners, distance education systems must evolve to create inclusive, digitally competent learning ecosystems that prepare learners for the demands of the 21st-century knowledge society.

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