



ISSN (O): 2320-5407
ISSN (P): 3107-4928

Journal Homepage: www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/24315
DOI URL: <http://dx.doi.org/10.21474/IJAR01/24315>



RESEARCH ARTICLE

ADOPTION AND USE OF ARTIFICIAL INTELLIGENCE AND MULTIMEDIA TECHNOLOGIES AMONG DISTANCE LEARNERS: A STUDY OF IGNOU DELHI REGION

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Manuscript Info

Manuscript History

Received: 20 June 2026
Final Accepted: 22 July 2026
Published: August 2026

Key words:-

Artificial Intelligence,
Multimedia Technologies,
Distance Learners, Technology
Adoption, Digital Learning,
IGNOU, Delhi Region, Online
Learning, AI in Education.

Abstract

The rapid development of Artificial Intelligence (AI), multimedia technologies, and digital learning platforms has transformed the landscape of distance education. Distance learners increasingly use digital resources such as online learning platforms, educational videos, digital libraries, mobile applications, video conferencing, podcasts, interactive multimedia resources, and AI-based tools to support their academic activities. However, the extent to which distance learners adopt and effectively use these technologies depends upon several factors, including perceived usefulness, ease of use, digital literacy, accessibility, technological infrastructure, awareness, cost, privacy concerns, and academic requirements. The present study investigates the adoption and use of AI and multimedia technologies among distance learners of the Indira Gandhi National Open University (IGNOU) in the Delhi Region. The study focuses on learners' level of awareness, frequency and purpose of technology use, perceived usefulness, ease of use, digital competence, barriers to adoption, and the perceived influence of these technologies on learning. It also examines the relationship between selected demographic/academic characteristics and technology adoption. A descriptive survey research design was employed. Data were collected from 300 selected IGNOU distance learners in the Delhi Region through a structured questionnaire developed specifically for the study. The questionnaire contained items related to AI awareness and use, multimedia technology use, perceived usefulness, ease of use, learning support, digital competence, ethical concerns, and barriers. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used.

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Inferential techniques, including independent-samples t-tests and one-way ANOVA, were employed to examine demographic variations. The study provides useful evidence concerning the emerging role of AI and multimedia

technologies in distance learning and contributes to the development of learner-support strategies, digital literacy programmes, and responsible technology-use policies in open and distance learning.

Introduction:-

Education has undergone substantial transformation with the emergence of information and communication technologies. The growth of digital technologies has particularly influenced open and distance learning, where learners depend considerably on mediated forms of communication, digital learning materials and technology-enabled interaction. Distance education provides flexibility to learners who may not be able to participate in conventional classroom-based education because of employment, geographical distance, family responsibilities, financial constraints or other circumstances. However, the effectiveness of distance learning increasingly depends on learners' ability to access, understand and use digital technologies.

Multimedia technologies have become an important component of contemporary distance education. Text, audio, video, animation, graphics, presentations, recorded lectures, online demonstrations, podcasts and interactive learning materials can provide learners with multiple ways of accessing educational content. Such resources may help learners understand difficult concepts, revise lessons and study according to their own pace. Alongside multimedia technologies, Artificial Intelligence has emerged as an important technological development in education. AI-based tools can assist learners with information searching, explanation of concepts, language support, summarization, brainstorming, personalized learning and other academic activities. Generative AI applications can produce text, images, explanations and other forms of content, creating both opportunities and challenges for education.

The increasing use of AI also raises questions concerning academic integrity, misinformation, privacy, dependence on technology, originality and digital inequality. UNESCO has highlighted the need for human-centred, ethical and appropriately regulated use of generative AI in education and research. The guidance emphasises human agency, inclusion, equity, privacy and meaningful educational use. For distance learners, these issues are particularly important because technology is not merely an additional educational resource; it is often an essential part of the learning environment. Therefore, understanding how learners adopt and use AI and multimedia technologies is important for improving the quality and effectiveness of distance education. The present study focuses on distance learners associated with IGNOU in the Delhi Region and attempts to examine their awareness, adoption patterns, purposes of use, perceived usefulness, digital competence, challenges and perceptions regarding AI and multimedia technologies.

Background of the Study:-

The traditional model of distance education relied heavily on printed self-learning materials, postal communication, counselling sessions and occasional face-to-face interaction. Technological developments have progressively expanded the range of learning resources available to distance learners. The emergence of the internet introduced online learning management systems, electronic resources, email communication and digital libraries. Subsequently, smartphones, mobile applications, video-sharing platforms and social media created additional channels for accessing educational content. Multimedia technologies provide opportunities for learners to combine different modes of representation. For example, a learner may read a printed or electronic chapter, watch a recorded lecture, listen to an explanation and use an interactive activity to reinforce understanding. Artificial Intelligence represents a further stage of technological development. AI-enabled systems can process information, generate responses and support a range of learning-related activities. Generative AI tools have made AI more accessible to ordinary learners because they can interact with such systems using natural language. However, technological availability does not automatically lead to meaningful adoption. A learner may have access to a smartphone but may not possess sufficient digital literacy to evaluate online information. Similarly, a learner may know about AI but may not understand its limitations or appropriate academic use. Consequently, technology adoption should be examined not only in terms of access but also in terms of awareness, perceived usefulness, ease of use, confidence, frequency, purpose and learning outcomes.

Statement of the Problem:-

The increasing availability of Artificial Intelligence and multimedia technologies has created new possibilities for distance learning. However, limited empirical understanding exists regarding how distance learners actually use these technologies, what purposes they serve, what benefits learners perceive and what barriers they encounter. The problem addressed in this study is therefore stated as: "Adoption and Use of Artificial Intelligence and Multimedia Technologies among Distance Learners: A Study of IGNOU Delhi Region."

Need and Significance of the Study:-

The increasing use of Artificial Intelligence (AI) and multimedia technologies has changed the way distance learners' access, understand, and use educational resources. For distance learners, these technologies can support flexible learning, access to digital study materials, understanding of difficult concepts, and independent learning. Therefore, it is important to examine how distance learners adopt and use AI and multimedia technologies for academic purposes. The present study focuses on distance learners of the IGNOU Delhi Region and examines their awareness, usage, perceived usefulness, digital confidence, challenges, and perceived impact of these technologies on their learning experience.

Significance for Distance Learners:-

The study will help identify the AI and multimedia technologies commonly used by distance learners and the academic purposes for which they are used. The findings may help identify areas where learners require additional technological guidance, digital skills, or academic support. The study may also contribute to a better understanding of how these technologies can support learners in accessing study materials, understanding difficult topics, preparing notes, and improving their overall learning experience.

Significance for IGNOU:-

The findings of the study may provide useful evidence for improving digital learner-support services at IGNOU. The results may assist in strengthening online learning resources, multimedia study materials, technology-oriented learner guidance, and digital support mechanisms. The findings may also help in understanding learners' needs and the areas where additional technological support or guidance may be required.

Significance for Research:-

The study may provide a basis for future research on the adoption and use of AI and multimedia technologies in distance education. It may support comparative studies across different learner groups, programmes, age groups, educational levels, and geographical regions. The findings may also provide a reference for researchers interested in digital learning, AI-assisted education, multimedia learning, and technology adoption among distance learners.

Review of Related Literature:-

The rapid development of digital technology has significantly transformed the structure and delivery of distance education. Technology has moved distance education beyond its traditional dependence on printed self-learning materials towards more flexible, interactive and learner-centred forms of education. Digital platforms, multimedia resources, online databases, mobile applications and artificial intelligence (AI) have created new opportunities for learners to access educational content, communicate with teachers and peers, and participate in learning activities irrespective of geographical location. However, the effectiveness of technology-supported distance education depends not only on the availability of technological resources but also on learners' awareness, digital competence, confidence, perceptions and ability to use technology appropriately.

Technology and Distance Education:-

Technology has progressively changed the structure of distance education by providing learners with greater flexibility in accessing educational content. Distance education has traditionally attempted to overcome geographical and temporal separation between teachers and learners, and technological developments have expanded the possibilities for interaction and independent learning. Moore's theory of transactional distance highlights that distance education involves more than physical separation; the level of dialogue, structure and learner autonomy also influences the educational experience (Moore, 1993). In this context, technology can provide additional opportunities for communication, interaction and learner support.

The use of online learning platforms, digital libraries, recorded lectures, discussion forums, educational websites and mobile technologies allows distance learners to access learning resources according to their individual schedules. Such technologies can support self-directed and flexible learning and can provide learners with supplementary resources beyond conventional self-learning materials. The growth of digital education has therefore made technology an increasingly important component of contemporary distance education. However, access to technology does not automatically lead to effective learning. Learners may experience barriers such as inadequate internet connectivity, lack of appropriate devices, insufficient technical support and limited digital skills. Therefore, technology integration should be considered in relation to learners' capabilities and learning contexts rather than merely in terms of technological availability. Research on digital competence in higher education indicates that many students possess basic digital skills but may experience limitations when they are required to perform more

complex digital tasks (Zhao et al., 2021). This suggests that digital competence is an important factor in determining how effectively distance learners can benefit from technology.

Multimedia Learning:-

Multimedia learning refers to learning through the combination of different forms of information, including written text, pictures, diagrams, audio, animation and video. Mayer's Cognitive Theory of Multimedia Learning proposes that learners process information through separate visual/pictorial and auditory/verbal channels, each having limited processing capacity. Well-designed multimedia instruction can therefore support meaningful learning by presenting information through complementary modes (Mayer, 2021). Multimedia resources can be particularly useful in distance education because learners may not have regular opportunities for face-to-face clarification from teachers. Video lectures, animations, diagrams, presentations and interactive learning materials can provide alternative explanations of complex concepts. Learners can also pause, replay and review recorded resources according to their individual learning needs. Consequently, multimedia may contribute to flexibility, learner engagement and independent study.

Nevertheless, the presence of multimedia does not necessarily guarantee improved learning. Poorly designed multimedia materials may present excessive or irrelevant information and increase learners' cognitive load. Therefore, multimedia should be designed according to sound instructional principles and should be directly related to learning objectives (Mayer, 2021). For distance learners, the usefulness of multimedia also depends on their ability to access and navigate digital resources. This connects multimedia learning with the broader issue of digital competence.

Artificial Intelligence in Education:-

Artificial intelligence has become an increasingly important area of educational technology. AI applications have been explored for intelligent tutoring, personalized learning, automated assessment and feedback, information retrieval and learner support. A systematic review by Zawacki-Richter et al. (2019) found that AI applications in higher education have been used across areas such as profiling and prediction, assessment and evaluation, adaptive systems and intelligent tutoring systems. Their review also highlighted the need for greater attention to the pedagogical and educational roles surrounding AI.

The emergence of generative AI has expanded these possibilities considerably. Generative AI systems can produce text, explanations, summaries and other forms of content in response to natural-language prompts. For distance learners, such tools may provide immediate assistance when teachers or tutors are not readily available. Learners may use AI for brainstorming, clarification of concepts, language support, summarization and obtaining explanations of difficult topics. However, the use of AI in education also presents important limitations. AI-generated information can be inaccurate, incomplete or misleading. UNESCO (Miao & Holmes, 2023) therefore emphasizes a human-centered approach to generative AI in education, including attention to ethical use, privacy, safety, equity and human agency. Learners should consequently develop the ability to evaluate and verify AI-generated information rather than accepting AI responses uncritically. The growing role of AI also makes digital competence increasingly important. Effective AI use requires more than knowing how to operate a tool; learners must understand its limitations, formulate appropriate queries, evaluate outputs and verify information using reliable academic sources. Thus, AI literacy can be viewed as an extension of broader digital competence.

AI and Academic Integrity:-

The increasing availability of generative AI has created new challenges concerning academic integrity, originality, authorship and assessment. AI tools can provide legitimate academic assistance, such as helping learners generate ideas, improve language or understand difficult concepts. However, inappropriate dependence on AI-generated content may reduce independent thinking and create concerns about the authenticity of submitted academic work. Eke (2023) discussed the potential implications of Chat GPT for academic integrity and highlighted concerns that inappropriate use of generative AI could undermine academic honesty. More recent systematic research has similarly identified both opportunities and risks associated with generative AI in higher education. A systematic review of studies published between 2021 and 2024 found that generative AI can improve educational engagement and efficiency but also creates significant risks related to academic dishonesty, highlighting the importance of digital literacy and appropriate institutional responses (Generative AI and Academic Integrity in Higher Education, 2025). Academic integrity in the age of AI therefore requires a balance between technological innovation and academic responsibility. Learners need clear guidance regarding appropriate and inappropriate uses of AI. They should also be encouraged to maintain responsibility for the accuracy, originality and integrity of their academic work. UNESCO's

guidance emphasises human agency, ethical safeguards, privacy and appropriate institutional approaches when integrating generative AI into education (Miao & Holmes, 2023).

Digital Competence and Confidence:-

Digital competence is an important factor in determining whether learners can use technology effectively for academic purposes. Digital competence involves more than basic technical skills; it can include information searching and evaluation, communication, content creation, problem-solving, safe and responsible technology use and the ability to adapt to changing digital environments. A systematic literature review by Zhao et al. (2021) found that research in higher education commonly examines students' and teachers' perceptions and levels of digital competence. The review indicated that many learners possess basic digital competence, while more complex areas of digital activity may present greater difficulties. Similarly, Sánchez-Caballé et al. (2020), in a systematic review of university students' digital competence, identified several dimensions, including information skills, communication, content creation, ethical skills, problem-solving and technical skills. These findings are particularly relevant to distance education because learners are often required to independently locate, evaluate and use digital resources. A learner may have access to an online platform but may not be able to use it effectively without adequate skills and confidence. Therefore, digital competence and confidence should be considered important dimensions when examining technology use among distance learners.

Technology Adoption and Perceived Usefulness:-

Technology adoption research provides an important theoretical basis for understanding why learners accept or reject digital technologies. The Technology Acceptance Model developed by Davis (1989) identifies perceived usefulness and perceived ease of use as important determinants of technology acceptance. Davis found that perceived usefulness was strongly associated with technology usage and that perceived ease of use also influenced users' perceptions and intentions. These concepts are particularly relevant to educational technology. Learners are more likely to use a digital tool when they believe that it will improve their academic activities, save time, provide useful information or make learning more convenient. Similarly, technologies that are perceived as difficult to use may discourage adoption even when learners recognise their potential benefits. Technology adoption in distance education is therefore influenced by multiple factors. Awareness of available tools, frequency of use, perceived usefulness, ease of use, digital competence, confidence and facilitating conditions may collectively shape learners' technology experiences. This perspective supports the need to examine not simply whether learners use technology, but also why they use it, how frequently they use it and how useful they perceive it to be.

Challenges and Barriers in Technology Use:-

Despite the potential benefits of educational technology, distance learners may face a range of challenges. These can include inadequate internet connectivity, limited access to suitable devices, lack of technical skills, insufficient training, difficulty evaluating online information, privacy concerns and uncertainty about appropriate AI use. Digital inequality may further affect learners' ability to benefit equally from technology. Research on digital competence indicates that students' skills are not necessarily uniform across all areas of digital activity. Learners may feel comfortable with basic technology use while experiencing difficulties with information evaluation, digital content creation, problem-solving or more advanced digital tasks (Zhao et al., 2021). Consequently, the presence of technological resources alone cannot eliminate educational inequalities. Understanding these barriers is particularly important in distance education because learners are often responsible for managing their own technological environment. Institutional support, technical assistance, training opportunities and accessible digital resources can therefore play an important role in facilitating effective technology use.

Learning Experience and Academic Impact:-

The integration of technology can influence learners' academic experiences in several ways. Digital resources can provide flexibility, improve access to information and support independent learning. Multimedia resources may help explain complex concepts, while AI-based tools may provide immediate feedback or additional explanations. These possibilities can potentially enhance learner engagement and support academic activities. However, the impact of technology is not necessarily positive in every situation. Excessive dependence on technology may reduce independent effort, while inaccurate online or AI-generated information may negatively affect learning. Similarly, technological difficulties can create frustration and reduce learner engagement. Therefore, the academic impact of technology depends on how appropriately and effectively it is integrated into the learning process. The literature suggests that technology should be viewed as a means of supporting learning rather than as a replacement for academic judgement, critical thinking and meaningful interaction. Digital competence, critical information literacy and responsible technology use are consequently important conditions for achieving positive learning outcomes.

Synthesis and Research Gap:-

The reviewed literature demonstrates that technology has become an important component of contemporary distance education. Digital platforms and multimedia resources can improve flexibility and access to educational content, while artificial intelligence offers new possibilities for personalised support, information retrieval and content generation. At the same time, the literature identifies concerns related to accuracy, academic integrity, privacy, digital inequality and inappropriate dependence on technology. Previous studies have examined several of these issues independently. Research on technology adoption has emphasised perceived usefulness and ease of use (Davis, 1989), while research on digital competence has highlighted the importance of technical, information, communication and problem-solving skills (Zhao et al., 2021; Sánchez-Caballé et al., 2020). Research on AI in higher education has examined its applications and potential, while more recent studies have increasingly focused on ethical concerns and academic integrity (Zawacki-Richter et al., 2019; Eke, 2023).

However, there remains a need to examine these dimensions together, particularly from the perspective of distance learners. Understanding learners' awareness of digital and AI-based tools, their types and frequency of use, perceived usefulness, digital competence and confidence, challenges and barriers, and the influence of technology on their learning experience and academic activities can provide a more comprehensive understanding of technology use in distance education. The present study therefore seeks to address this gap by examining technology use from multiple interconnected dimensions. The review provides a conceptual foundation for the study's objectives relating to awareness, usage patterns, perceived usefulness, digital competence and confidence, challenges, and learning and academic impact.

Table:1 Key References Used in the Literature Review

Author(s)	Year	Main Contribution	Relevant Objective
Vis	1989	Technology Acceptance Model; perceived usefulness and perceived ease of use	Objective 2 & 3
Boore	1993	Theory of Transactional Distance in distance education	Objective 6
Zawacki-Richter et al.	2019	Systematic review of AI applications in higher education	Objective 1, 2 & 6
Sánchez-Caballé et al.	2020	Systematic review of university students' digital competence	Objective 4
Zhao et al.	2021	Systematic review of digital competence research in higher education	Objective 4 & 5
Mayer	2021	Cognitive Theory of Multimedia Learning	Objective 6
Zhao & Holmes	2023	UNESCO guidance on generative AI in education and research	Objective 1 & 2
Eke	2023	AI/Chat GPT and academic integrity	

Objectives of the Study:-**The study has the following objectives:-**

- ☐ To examine the level of awareness of Artificial Intelligence and multimedia technologies among distance learners of IGNOU Delhi Region.
- ☐ To identify the types and frequency of Artificial Intelligence and multimedia technologies used by distance learners for academic purposes.
- ☐ To examine the perceived usefulness of Artificial Intelligence and multimedia technologies in supporting the learning process of distance learners.
- ☐ To assess the level of digital competence and confidence of distance learners in using Artificial Intelligence and multimedia technologies.
- ☐ To identify the major challenges and barriers faced by distance learners in adopting and using Artificial Intelligence and multimedia technologies.
- ☐ To examine the perceived impact of Artificial Intelligence and multimedia technologies on the learning experience and academic performance of distance learners.

Research Questions:-

- 1) What is the level of awareness of Artificial Intelligence and multimedia technologies among distance learners of IGNOU Delhi Region?
- 2) What types of Artificial Intelligence and multimedia technologies are used by distance learners, and how frequently are they used for academic purposes?
- 3) How do distance learners perceive the usefulness of Artificial Intelligence and multimedia technologies in supporting their learning?
- 4) What is the level of digital competence and confidence of distance learners in using Artificial Intelligence and multimedia technologies?
- 5) What major challenges and barriers do distance learners face while adopting and using Artificial Intelligence and multimedia technologies?
- 6) How do distance learners perceive the impact of Artificial Intelligence and multimedia technologies on their learning experience and academic performance?

Research Methodology:-**Population of the Study:-**

The population of the study consisted of distance learners enrolled with the Indira Gandhi National Open University (IGNOU) and associated with the Delhi Region during the academic session 2024–2025. The study included learners enrolled in Undergraduate, Postgraduate, Diploma/Certificate, and other programmes.

Sample of the Study:-

A sample of 300 distance learners from the IGNOU Delhi Region was included in the study. The respondents were drawn from different programme categories to represent the diverse learner population. The distribution of respondents according to their programme category is presented in Table 5.1.

Table 2: Distribution of Respondents by Programme Category

Programme Category	Frequency	Percentage
Undergraduate	176	58.7%
Postgraduate	92	30.7%
Diploma/Certificate	29	9.7%
Other	3	1.0%
Total	300	100.0%

The table shows that 58.7% of the respondents were Undergraduate learners, while 30.7% were Postgraduate learners. Diploma/Certificate learners constituted 9.7% of the sample, and 1.0% belonged to other programme categories. Thus, the sample represented learners from different levels of programmes offered through the IGNOU Delhi Region.

Research Design:-

The study adopted a descriptive research design to examine the adoption and use of Artificial Intelligence (AI) and multimedia technologies among distance learners in the IGNOU Delhi Region. The descriptive approach was used to describe the characteristics, awareness, adoption, and patterns of use of these technologies among the selected respondents.

Data Collection & Data Analysis:-

The study was based on primary data collected from distance learners through a structured questionnaire. The questionnaire consisted of objective and Likert-scale items related to the awareness, adoption, and use of Artificial Intelligence and multimedia technologies for academic purposes. The collected data were coded and analysed using appropriate statistical techniques. Frequency and percentage were used to describe the demographic and categorical characteristics of the respondents. For Likert-scale items, descriptive statistics such as frequency, percentage, mean, and standard deviation were used.

Reliability and Validity:-

The reliability and validity of the questionnaire were assessed through a pilot study conducted before the final data collection. The pilot study was conducted on 30 distance learners to assess the clarity, comprehensibility and

suitability of the questionnaire items. The questionnaire consisted of items related to Artificial Intelligence (AI) and multimedia technologies and used a five-point Likert scale ranging from Strongly Disagree to Strongly Agree. Based on the observations and feedback obtained from the pilot study, necessary modifications were made to improve the clarity and suitability of the questionnaire. The final questionnaire was then used for collecting data from 300 distance learners of IGNOU Delhi Region.

Data Analysis:-

Demographic variables data:-

Demographic Variable	Grouping Variable	AI Adoption & Use	Multimedia Technology Use
Gender	Male Female	$t = -1.494, p = .136$	$t = 1.223, p = .222$
Programme	UG, PG Diploma/Certificate Other	$F = 0.840, p = .473$	$F = 1.874, p = .134$
Level of Study	First year Second year Third year Other	$F = 0.888, p = .448$	$F = 0.508, p = .677$
Age Group	Below 20, 20–25, 26–30, 31–40, Above 40	$F = 1.009, p = .403$	$F = 0.766, p = .548$

Table: 3 Inferential Analysis of AI Adoption and Multimedia Technology by Demographic Variables

The table presents the results of inferential statistical analysis examining differences in the adoption and use of Artificial Intelligence (AI) and multimedia technologies across different demographic variables. An independent-samples t-test was used to examine differences based on gender, while one-way ANOVA was used to examine differences based on programme, level of study, and age group. The results show that there was no statistically significant difference between male and female respondents in AI adoption and use ($t = -1.494, p = .136$) or multimedia technology use ($t = 1.223, p = .222$). Similarly, the ANOVA results indicated no statistically significant differences among programme groups in AI adoption and use ($F = 0.840, p = .473$) or multimedia technology use ($F = 1.874, p = .134$).

With respect to level of study, no statistically significant difference was observed in AI adoption and use ($F = 0.888, p = .448$) or multimedia technology use ($F = 0.508, p = .677$). Likewise, age group did not show a statistically significant difference in AI adoption and use ($F = 1.009, p = .403$) or multimedia technology use ($F = 0.766, p = .548$). Since all p-values are greater than the 0.05 significance level, the null hypothesis is not rejected. Overall, the findings suggest that gender, programme, level of study, and age group did not significantly influence the adoption and use of AI and multimedia technologies among the respondents in the present study.

AI Adoption and Use Analysis:-

The AI section has an overall mean of 3.89/5. The pattern suggests awareness and practical use of AI tools for academic learning. Students show favorable responses toward using AI for understanding topics, preparing notes, completing work, saving time, and improving learning. The highest AI Statement mean is AI1 (4.08). The lowest is AI10 (2.91). AI10 is negatively framed (difficulties/concerns), so a lower score on this item represents fewer reported concerns rather than a less positive learning outcome.

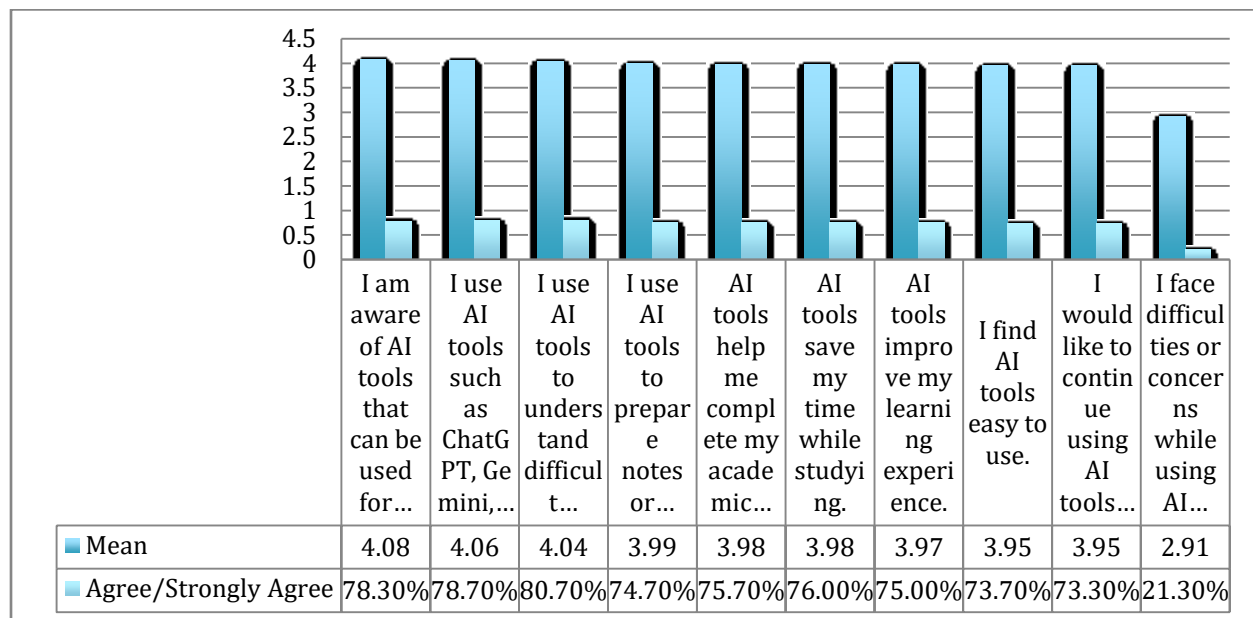


Figure: AI Adoption and Use Analysis

Table 4 AI Adoption and Use Analysis

S.no	Statement	Mean	Agree/Strongly Agree
1	I am aware of AI tools that can be used for learning.	4.08	78.3%
2	I use AI tools such as ChatGPT, Gemini, etc. for academic purposes	4.06	78.7%
3	I use AI tools to understand difficult topics.	4.04	80.7%
4	I use AI tools to prepare notes or summaries.	3.99	74.7%
5	AI tools help me complete my academic work more easily.	3.98	75.7%
6	AI tools save my time while studying.	3.98	76.0%
7	AI tools improve my learning experience.	3.97	75.0%
8	I find AI tools easy to use.	3.95	73.7%
9	I would like to continue using AI tools for my studies.	3.95	73.3%
10	I face difficulties or concerns while using AI tools for learning.	2.91	21.3%

The table presents the mean and standard deviation of the respondents' responses regarding the adoption and use of Artificial Intelligence (AI) for academic purposes. The overall mean score was 4.256 with a standard deviation of 0.436, indicating a high level of agreement among the respondents regarding the adoption and use of AI tools in learning. Among the individual statements, AI awareness and the use of AI tools for understanding difficult topics recorded the highest mean score of 5.00 (SD = 0.00). This indicates complete agreement among the respondents on these aspects. The mean score for the academic use of AI tools was 4.10 (SD = 0.30), showing that respondents generally agreed that they use AI tools for academic purposes. The respondents also showed a high level of agreement that AI tools save study time (Mean = 4.12, SD = 0.32), are easy to use (Mean = 4.13, SD = 0.34), improve the learning experience (Mean = 4.04, SD = 0.20), and encourage continued use for studies (Mean = 4.04,

SD = 0.20). Similarly, respondents agreed that AI tools help them in preparing notes and summaries (Mean = 4.02, SD = 0.14) and completing academic work more easily (Mean = 4.02, SD = 0.15). The statement related to difficulties or concerns while using AI tools also obtained a mean of 4.13 (SD = 0.34). This item should be interpreted separately because a higher score indicates a greater presence of difficulties or concerns rather than a positive perception of AI. Overall, the findings indicate that the respondents demonstrated a generally positive level of adoption and use of AI tools for academic learning, while also reporting some concerns regarding their use.

Multimedia Technology Analysis:-

The multimedia section records a mean of 4.05/5. The results indicate favourable use of educational videos, audio/video lectures, e-books, PDFs and other digital learning resources. The responses also suggest that multimedia can support understanding, interest, flexible learning and self-paced study. The highest multimedia item mean is MT1 (4.14), while the lowest is MT7 (3.94).

S.No	Statement	Mean	Agree/Strongly Agree
1	I find multimedia learning resources easy to access and use.	4.14	85.3%
2	I use e-books, PDFs and digital study materials for learning.	4.12	80.3%
3	Multimedia technologies improve my overall learning experience	4.10	79.3%
4	I use educational videos for better understanding of topics.	4.09	80.0%
5	I would like to continue using multimedia technologies for my studies	4.08	79.0%
6	Multimedia resources make learning more interesting for me.	4.08	80.7%
7	I regularly use multimedia resources for my studies.	4.01	76.7%
8	Multimedia resources help me understand difficult concepts.	4.00	76.7%
9	I use audio/video lectures provided through online platforms.	3.99	75.7%
10	Multimedia resources help me learn at my own pace	3.94	73.0%

Table: 5 Multimedia Technology Analysis

The table presents the mean scores and percentage of respondents who agreed or strongly agreed with the statements related to the adoption and use of multimedia technologies for academic purposes. The findings indicate an overall positive perception and use of multimedia learning resources among the respondents. The highest mean score was recorded for the statement “I find multimedia learning resources easy to access and use” (Mean = 4.14), with 85.3% of respondents selecting Agree or Strongly Agree. This was followed by the use of e-books, PDFs and digital study materials for learning (Mean = 4.12; 80.3%) and the perception that multimedia technologies improve the overall learning experience (Mean = 4.10; 79.3%). The respondents also showed a high level of agreement with the use of educational videos for better understanding of topics (Mean = 4.09; 80.0%) and their intention to continue using multimedia technologies for their studies (Mean = 4.08; 79.0%). Similarly, respondents agreed that multimedia resources make learning more interesting (Mean = 4.08; 80.7%). The statements related to regular use of multimedia resources (Mean = 4.01; 76.7%), understanding difficult concepts (Mean = 4.00; 76.7%), and the use of audio/video lectures through online platforms (Mean = 3.99; 75.7%) also received positive responses. The lowest mean score was observed for the statement “Multimedia resources help me learn at my own pace” (Mean = 3.94; 73.0%); however, the score still indicates a generally positive response. Overall, the findings suggest that the respondents have a positive perception of multimedia technologies and use various multimedia resources, particularly digital study materials, educational videos, and online learning resources, to support their academic learning.

Section-wise Results:-**Table 6 shown all three-section means are above the neutral midpoint of 3.00. This indicates a positive tendency in the simulated responses.**

Section	Mean Score	Descriptive Interpretation
AI Adoption and Use	3.89/5	Generally positive
Multimedia Technology Adoption and Use	4.05/5	Generally positive
Overall Perception	4.06/5	Generally favourable

Analysis of Section-wise Results:-

The section-wise analysis shows that the respondents had a generally positive perception towards the adoption and use of Artificial Intelligence and multimedia technologies for academic purposes. The mean score for AI Adoption and Use was 3.89 out of 5, which is above the neutral midpoint of 3.00, indicating a generally positive level of AI adoption and use among the respondents. The mean score for Multimedia Technology Adoption and Use was 4.05 out of 5, which was higher than the AI adoption score. This indicates that respondents showed a generally positive tendency towards the use of multimedia technologies such as digital study materials, educational videos, audio/video lectures, and other multimedia learning resources. The Overall Perception recorded the highest mean score of 4.06 out of 5, indicating a generally favourable perception towards the use of AI and multimedia technologies in distance learning. Since all three mean scores are above the neutral midpoint of 3.00, the findings indicate an overall positive tendency in the responses. Among the three sections, multimedia technology adoption and overall perception received relatively higher mean scores than AI adoption and use. These findings suggest that the respondents generally viewed digital and technology-supported learning resources positively.

Discussion:-

The present study found generally positive responses towards the adoption and use of AI and multimedia technologies among distance learners. The overall perception mean was 4.06/5, while multimedia technology adoption and use recorded a mean of 4.05/5. This indicates that respondents generally viewed technology-supported learning resources positively. The findings concerning multimedia technologies are consistent with earlier research showing that students can perceive multimedia resources as useful learning tools. Evans reported that university students considered podcast-based revision resources useful and valued their flexibility in terms of when and where they could be used. Similarly, research on multimedia in education found that students recognised multimedia as an effective and efficient supplement to learning, although they did not necessarily view it as a complete replacement for traditional teaching.

The present finding that multimedia resources received a relatively high mean score is also consistent with research examining rich-media resources in higher education. That study examined students' use and perceptions of videos, interactive resources and other digital materials, including in distance-learning contexts, and highlighted the importance of understanding which digital resources students actually use and value. The positive perception of digital learning is also broadly consistent with research on online learning in Indian universities. A study involving 372 complete responses reported that adaptability, affordability, bandwidth, understanding and interaction positively influenced online-learning effectiveness. For AI adoption, the results show a generally positive tendency, particularly in students' reported use of AI for academic activities and understanding difficult topics. This is relevant to the direction identified in IGNOU's institutional planning documents, which specifically discuss the potential use of AI to support learners, provide feedback, assess learning progress and personalize learner-support services. The demographic analysis, however, did not show statistically significant differences in AI adoption or multimedia technology use across gender, programme, level of study or age group. Therefore, within this sample, the available evidence does not indicate that these demographic characteristics were associated with statistically significant differences in technology adoption.

Educational Implications:-

The findings have implications for IGNOU, learners, counsellors and distance education.

For IGNOU:-

IGNOU may continue strengthening digital learning infrastructure and learner-support services. The university's institutional planning already identifies digital learning hubs, improved learner-support infrastructure and AI-based learner services as areas for development.

For Learners:-

Learners can use AI and multimedia resources to supplement self-learning, understand difficult concepts, revise course content and access learning materials at convenient times. However, AI-generated information should be checked against reliable academic sources.

For Counsellors:-

Counsellors can guide learners regarding appropriate use of AI tools, digital resources, educational videos and online learning platforms. They can also help learners distinguish between useful academic resources and unreliable online information.

For Distance Education:-

The findings support continued integration of multimedia resources into distance education. IGNOU itself recognizes the importance of audio, video, computer and other educational communication technologies in distance education.

Recommendations:-

1. IGNOU may provide structured orientation programmes on the responsible academic use of AI tools.
2. Learners should be trained in AI literacy, information verification and academic integrity.
3. More high-quality educational videos, audio lectures, e-books and interactive digital materials may be developed.
4. Counsellors may provide guidance on selecting appropriate digital and AI-based learning resources.
5. AI tools should be used as supporting learning resources, rather than as substitutes for independent learning.
6. IGNOU may strengthen digital support facilities for learners who experience difficulties accessing online resources.
7. Regular feedback from distance learners may be collected to identify which multimedia resources are most useful.

Future studies may examine AI and multimedia adoption using larger samples and learners from different IGNOU regions

Limitations of the Study:-

1. The study was limited to distance learners of the IGNOU Delhi Region; therefore, the findings may not directly represent learners from all IGNOU regions.
2. The study was based on a sample of **300** active respondents.
3. Data were collected through a structured questionnaire and therefore depended on respondents' self-reported responses.
4. The study primarily examined adoption, use and perceptions rather than directly measuring students' academic achievement.
5. The study focused on selected demographic variables such as age, gender, programme and level of study.
6. AI technologies are developing rapidly; therefore, patterns of AI use may change over time.
7. The study does not establish a causal relationship between technology use and academic performance.

Conclusion:-

The present study examined the adoption and use of Artificial Intelligence and multimedia technologies among distance learners of IGNOU Delhi Region. Based on the responses of 300 learners, the findings indicate a generally positive tendency towards the use of technology for academic purposes. The mean score for AI Adoption and Use was 3.89 out of 5, while Multimedia Technology Adoption and Use recorded a mean score of 4.05. The Overall Perception mean was 4.06, indicating a generally favourable perception towards technology-supported learning. The multimedia findings particularly indicate positive use of digital study materials, educational videos and other multimedia learning resources.

The inferential analysis showed no statistically significant differences in AI adoption and multimedia technology use across gender, programme, level of study or age group at the 5% significance level. This suggests that the observed differences among these demographic groups were not statistically significant within the study sample. Overall, the findings indicate that AI and multimedia technologies have become relevant components of the learning experience of distance learners. Their effective integration, together with appropriate learner guidance, digital literacy and responsible use, can support self-directed and flexible learning in distance education. The study also highlights the importance of co-develop accessible, reliable and learner-centered digital resources for distance learners.

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