The Role of AI in Teaching, Learning, Research and Clinical Practice: A Study at BLDE (Deemed to be University)

Thesis submitted to BLDE [Deemed to be University] for the Partial Fulfilment for the award of the degree of

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In

Library and Information Science

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Date:

Place: Vijayapura

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LIST OF ABBREVIATIONS

Abbreviation	Full Form
AI	Artificial Intelligence
BLDE (DU)	BLDE (Deemed to be University)
MLISc	Master of Library and Information Science
UG	Undergraduate
PG	Postgraduate
PhD	Doctor of Philosophy
SPSS	Statistical Package for the Social Sciences
CDSS	Clinical Decision Support System
NLP	Natural Language Processing
HER	Electronic Health Records
IBM	International Business Machines
UNESCO	United Nations Educational, Scientific and Cultural Organization
WHO	World Health Organization
AMBOSS	Knowledge platform for medical education
edX	Online learning platform (Education X)
MD	Doctor of Medicine
MS	Master of Surgery
BDS	Bachelor of Dental Surgery
MBBS	Bachelor of Medicine, Bachelor of Surgery

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ABSTRACT

Title:

The Role of Artificial Intelligence on Teaching, Learning, Research and Practice in Clinical Practice: A Study at BLDE (Deemed to be University)

Background:

Artificial Intelligence (AI) has emerged as a transformational agent within education, research, and health care. The global growth of AI is apparent; however, there is still minimal academic evidence for levels of AI awareness, usage, and preparedness in medical or medical education institutions in India. This study seeks to evaluate the current state of AI integration at BLDE (Deemed to be University) in Vijayapura.

Objectives:

- To identify existing applications of AI in teaching and learning.
- To investigate the impact of AI on research processes and outcomes.
- To evaluate the use of AI in the practice of medicine and patient care.
- To explore ethical considerations and barriers to AI integration. To provide recommendations for responsible and impactful use of AI.

Methods:

A mixed-methods research design was used to obtain quantitative and qualitative data. A structured questionnaire followed by semi-structure interviews were employed with 121 participants including faculty, undergraduate and postgraduate students, and clinicians. Quantitative data were analyzed using SPSS and descriptive statistics, while qualitative data were analyzed thematically.

Results and results:

The study results indicated that 79% of the participants had a neutral-to-positive opinion on the use of AI to teach or learn. ChatGPT (94.2%), MedGPT, and Gemini were the most commonly utilized AI programs for teaching and learning. ChatGPT (66.1%) and Mendeley/Zotero (38%) were frequently used in research. Only 19% of clinicians reported using AI in patient care. Concerns for reliability and ethics were primary barriers for AI use in patient care. In spite of these challenges, 71.1% of participants indicated they would like further training. No statistically significant difference in AI use or AI opinion was observed among gender groups ($p > 0.05$).

Conclusions:

AI is viewed as a valuable tool for improving efficiency in teaching, productivity in conducting research, and accuracy in the diagnostic process. Limited exposure and training, technology infrastructure, and ethical issues limit opportunities for teaching and learning AI. It is important for key stakeholders to provide relevant strategies and interventions such as AI literacy programs, faculty development, and policy frameworks at the institution level, to improve the successful and ethical use of AI.

Keywords:

Artificial Intelligence, Teaching, Learning, Research, Clinical Practice, BLDE University, Medical Education, AI Integration.

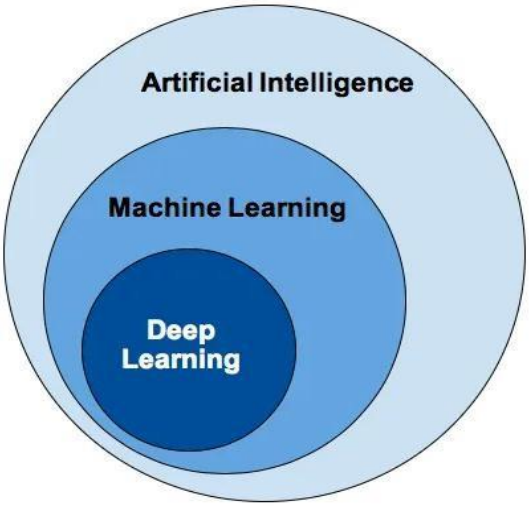
CHAPTER: 1

INTRODUCTION

1.1 Introduction to Artificial Intelligence

Definition of Artificial Intelligence

Artificial Intelligence (AI) refers to the imitation of human intellectual processes by machines, specifically computer systems. As defined by John McCarthy in 1956, AI is "the science and engineering of making intelligent machines, especially intelligent computer programs." AI involves systems that are intended to execute activities that normally demand human intelligence, like comprehending natural language, identifying patterns, problem-solving, and learning from experience. It comprises a broad spectrum of technologies, including machine learning, neural networks, deep learning, natural language processing (NLP), robotics, and computer vision with different functionalities for data prediction, analysis, and automation.(Latif et al., 2024)



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(Figure--1) Ingredients and Methods of AI

Historical Development of AI The history of AI can be traced back to ancient myths of mechanical men and machines. Still, the formal origin of AI dates back to the 1950s. The pioneering work of Alan Turing on computable numbers and his definition of the Turing Test established the basis for measuring machine intelligence. In 1956, the Dartmouth Conference formally recognized AI as a branch of academic study. Early AI emphasized symbolic problem-solving and reasoning but was hindered by the lack of computational resources. (Banerjee et al., 2021)

The field evolved through eras of explosive growth and plateauing, referred to as AI winters, because of exaggerated expectations and not being able to meet them. But

with the development of supercomputers, the availability of big data, and sophisticated algorithms during the late 2000s, AI experienced dramatic growth. Now, AI technologies are embedded in all industries, such as finance, education, healthcare, industry, and public administration, revolutionizing processes and service delivery globally. (Fischetti et al., 2022)

Types of Artificial Intelligence

Artificial intelligence systems can be categorized into two broad categories:

Narrow AI (Weak AI) – It is created to accomplish certain tasks with great efficiency but without any consciousness or self-awareness. Voice assistants such as Siri, Google Assistant, and AI imaging tools used in radiology are examples.

General AI (Strong AI) – Speculative systems with human-level intelligence and the ability to perform any cognitive task a human can, such as reasoning, planning, and problem-solving without human intervention. This is still mostly theoretical at this time. (Burn & Mutton, 2015)

A classification of functions also includes:

Reactive Machines: Basic AI systems that don't retain memories or experiences. Example: IBM's Deep Blue chess machine

Limited Memory: Systems that apply past data for decision-making, e.g., autonomous cars.

Theory of Mind: In development; will be able to comprehend emotions, beliefs, and social interactions.

Self-Aware AI: Future conscious and self-aware AI, not yet attained.(Arnold, 2021)

Key Ingredients and Methods of AI

AI combines several components and sub disciplines:

Machine Learning (ML): Programs that allow systems to learn patterns from information and make decisions. Includes supervised, unsupervised, and reinforcement learning.

Deep learning: A branch of ML that includes neural networks with multiple layers, great at image and speech recognition.

Natural Language Processing (NLP): Allows machines to comprehend and understand human language. Applied in chatbots, translators, and summarization.

Computer Vision: Enables machines to understand visual information from the world, used in medical imaging and security systems.

Robotics: Merges: AI with mechanical engineering to develop self-acting machines that can execute complicated tasks in manufacturing and medicine.

Expert Systems: Computer programs that imitate human experts' decision-making capabilities, applied for diagnosis and financial analysis. (Yin et al., 2021)

1.2 Rationale and significance of the study

The application of Artificial Intelligence (AI) in education, research, and healthcare is revolutionizing the world by improving efficiency, precision, and customized service delivery. Healthcare universities across the globe are embracing AI for enhancing teaching-learning practices, promoting high-quality research, and enhancing clinical decision-making. Nonetheless, in India, the adoption of AI in academic institutions and healthcare facilities is uneven and frequently not documented. (Alowais et al., 2023)

BLDE (Deemed to be University) is a pioneering institution offering undergraduate, postgraduate, and doctoral courses in health sciences with an attached teaching hospital serving rural and semi-urban populations. Although there has been progress in curriculum, research facilities, and clinical care, empirical evidence on awareness, usage, and preparedness of faculty, students, and clinicians towards the adoption of AI within the institution is scarce. (Reffien et al., 2021)

The justification of this study stems from three major considerations:

Closing Knowledge Gaps: There are limited localized data to evaluate the prevailing status of AI integration in learning, teaching, research, and clinical practice at BLDE. It is crucial to know this gap in order to plan and make informed decisions at the institutional level.

Conforming to National and International Trends: NEP 2020 and NITI Aayog's National Strategy for AI are based on adopting digital and AI-based technologies in education and health to ensure quality, inclusivity, and innovation. Institutional readiness assessment conforms to the national agendas and international trends in medical education and health systems strengthening.

Increasing Institutional Competitiveness: Implementing AI in academic, research, and clinical areas increases institutional excellence, readies students to meet the fast-changing nature of the job market, aids faculty research productivity, and enhances the outcomes of patient care. Knowing the existing strengths and challenges allows for specific interventions to attain these results. (Reffien et al., 2021)

Significance of the Study

The study is important for a number of reasons:

For Faculty and Teaching Development: Through measuring faculty awareness and use of AI in teaching, the study will give insights into capacity-building needs, training programs, and curriculum redesign in incorporating AI-based pedagogical methodologies effectively.

For Student Learning and Skill Development: AI tools exposure to medical students makes them more ready for upcoming roles demanding digital skills. The research reveals existing patterns of use, advantages, and challenges, making it easier to plan learning materials and policies to integrate AI meaningfully into students' learning.

For Research Development: I improves data analysis, systematic review, predictive modeling, and clinical research effectiveness. Formulating plans to enhance research capabilities and products in BLDE DU through understanding the ways faculty members and students presently use AI for research will be based on it.

For Clinical Practice Improvement: AI uses in diagnostics, treatment planning, and patient management enhance precision, minimize human mistakes, and support evidence-based choices. This research will identify clinicians' viewpoints regarding

AI, likely areas of integration within hospital practice, and corresponding ethical or operational issues.

For Policy and Strategic Planning: The results will assist policymakers and university leadership in crafting institutional investments, strategies, and partnerships to implement AI technologies optimally in raising the quality of education, research output, and patient care services.

For Contribution to Literature: The study will contribute to the scarce literature on AI integration in Indian medical schools as a point of reference for other institutions seeking to introduce AI-based innovations into their curricula, research, and clinical practices.(Zhang et al., 2023),(Recht et al., 2020)

1.3 Problem statement

Problem statement for the study is ***—The Role of AI in Teaching, Learning, Research and Clinical Practice: A Study at BLDE (Deemed to be University)"***

1.4 Research questions/hypothesis

Research Questions

- **Teaching and Learning**
- Years of Experience in Teaching/Clinical practice
- Have you attended any AI training/workshops?
- If yes, which AI-related training/workshop did you attend?
- To what extent do you agree that AI improves teaching & learning efficiency?
- AI Usage in Teaching & Learning
- **Research**
- Which AI tools do you use in teaching and learning?
- To what degree do you believe AI improves teaching & learning effectiveness?
- AI Usage in Medical Research
- How often do you use AI tools for research and analysis?
- To what degree do you believe AI improves teaching & learning effectiveness?
- **Clinical Practice**
- AI Usage in Medical Research- How frequently do you use AI tools for research and data analysis?
- Which AI research tools do you use? (Select all that apply)

- To what extent do you agree that AI improves medical research efficiency and accuracy?
- To what extent do you agree that AI improves medical research efficiency and accuracy?

Overall Institutional Impact

- Receptions and Future of AI Do you think AI will profoundly change healthcare and education within the next 5 years
- Do you want AI-related training or certification in the future?
- Do you favor greater integration of AI in medical education and clinical practice within BLDE (Deemed to be University)?
- Any further comments or recommendations on integrating AI in BLDE (Deemed to be University)?

Hypotheses

Based on the above research questions, the study proposes the following testable hypotheses:

- AI integration in education improves students' comprehension, retention, and usage of advanced medical concepts significantly.
- Staff members with previous training in AI are more inclined to have positive attitudes towards implementing AI tools in teaching practice than their counterparts without training.
- Application of AI-based data analysis tools results in greater research productivity and publication rates among BLDE (DU) staff and researchers.
- AI implementation in clinical environments enhances diagnostic accuracy and decreases decision time in patient care.
- Institutional training and infrastructure are major constraints for successful AI implementation at BLDE (DU).

1.5 Scope and limitation

Scope

This research investigates the incorporation and influence of Artificial Intelligence (AI) in the areas of teaching, learning, research, and clinical practice in BLDE (Deemed to be University). It finds out how AI-based tools, platforms, and systems are employed by the faculty members, students, researchers, and clinicians within the university. The coverage includes:

Learning and Teaching: Application of AI in adaptive learning systems, virtual simulations, automated test tools, learning pathways tailored to individual needs, and interactive learning technologies that support student participation and performance.

Research: Utilization of AI in data analysis, predictive modelling, systematic review, optimized literature searching, and research workflow automation to enhance research efficiency and quality.

Clinical Practice: Integration of AI in diagnostics (radiology, pathology, and dermatology), treatment planning, clinical decision support systems (CDSS), patient record management, and hospital administration to make them efficient, accurate, and provide improved patient care.

Stakeholders: BLDE (Deemed to be University) faculty members, undergraduate and postgraduate students, researchers, and clinicians.

Data Sources: Institutional records of AI usage, structured questionnaires, in-depth interviews, observation of practices enabled by AI, and examination of current AI infrastructure.

This wide scope will enable one to comprehend the level of readiness, advantages, issues, and ethical concerns of implementing AI in the university.

Limitations

Despite its wide scope, the study has certain limitations:

Institutional Focus: The study is limited to BLDE (Deemed to be University) only and no comparative study with other universities or institutions is made, thus restricting generalizability.

Time Constraints: Because the research is time-bound, only recent practices and opinions are evaluated, with no follow-up after a long period on the results of AI interventions.

Rapid Technological Changes: AI technologies change rapidly, and results can become obsolete with new AI tools and applications.

Sample Size and Response Bias: Faculties' or clinicians' limited availability for interviews and potential response bias in self-reported data can influence the richness of qualitative findings.

Technical Knowledge Gaps: Differences among respondents' perceptions of AI can restrict the richness of discussions, particularly among users with limited exposure to AI technologies.

Legal and Policy Considerations: The research does not explore legal, policy, and data governance mechanisms that are essential for AI deployment.
Infrastructure Limitations: Restraints in evaluating AI applications that call for advanced infrastructure not yet established in the institution.

1.6 Operational Definitions

Artificial Intelligence (AI): Artificial Intelligence in this research is computer-oriented systems and technologies that have the ability to execute tasks that would otherwise demand human intelligence. They encompass but are not limited to machine learning algorithms, natural language processing tools, virtual assistants, and AI-based diagnostic or analytical systems employed in education and health environments.

Teaching: Instruction is operationalized as the act of transferring knowledge, skills, and attitudes to undergraduate, postgraduate, and doctoral students at BLDE (Deemed to be University) through conventional procedures (lectures, practical's) supplemented with AI tools like intelligent tutoring systems, automated testing, and adaptive learning platforms

Learning: Learning means the acquisition of knowledge, skills, and abilities by the students through teaching in classrooms, clinical experience, research training, and AI-based educational technology. In this regard, it encompasses independent learning through AI applications, simulations, and virtual laboratories accessed by students.
Research: Research is hereby defined as systematic study conducted by faculty, postgraduate, and doctoral researchers of BLDE (Deemed to be University) to create new knowledge or establish existing knowledge in their respective fields. It encompasses the application of AI for literature review automation, data analysis, predictive modelling, and manuscript preparation.

Clinical Practice: Clinical practice refers to the delivery of medical, surgical, and diagnostic services by postgraduate students and faculty in BLDE teaching hospitals. For this research, it encompasses the incorporation of AI technologies like diagnostic

imaging AI, clinical decision support systems, electronic health record analytics, and telemedicine platforms to enhance patient care.

BLDE (Deemed to be University): BLDE (Deemed to be University) in this study is used to denote the university in Vijayapura, Karnataka, which includes its constituent medical college, hospital, dental college, nursing college, and research centers where AI integration in teaching, learning, research, and practice is under investigation.

Faculty Members: Those teaching staff members who work in medical and employ or utilize AI tools in teaching, research, or clinical practice are referred to as faculty members.

Postgraduate Students: these are postgraduate students who are seeking MD/MS, MDS, and have interactions with AI for studying, thesis, or clinical training.

Undergraduate Students: Students studying in MBBS, who are exposed to AI tools in their educational process.

AI Tools in Education and Healthcare: AI Tools in Education and Healthcare: Operationally defined as software or hardware-based technologies adopted in the institution to deliver educational content, student testing, research data analysis, patient diagnosis, treatment planning, and management of the hospital.

1.7 Chaptersation

Chapter 1: Introduction: It is a general introduction to Artificial Intelligence, its definitions, historical development, evolution, and world context in education and healthcare. It explains the study's background, problem statement, purpose and objectives, research questions/hypotheses, scope, and limitations. It also includes operational definitions and the study's significance. This chapter formulates the basis and justification of the research.

Chapter 2: Aims and objectives: The objective of this research is to evaluate the contribution of Artificial Intelligence (AI) in learning, teaching, research, and clinical practice at BLDE (Deemed to be University), Vijayapura.

Objective 1: Identify current AI applications in teaching and learning at BLDE (DU).

Objective 2: Explore AI’s impact on research processes and academic outputs

Objective 3: Assess AI use in clinical practice with emphasis on patient care and diagnostics.
Objective 4: Investigate ethical concerns and challenges in AI integration.
Objective 5: Recommend strategies for enhancing AI adoption and responsible use.

Chapter 3: Review of Literature: The second chapter includes a comprehensive review of national and international literature concerning AI in teaching, learning, research, and clinical practice. It reviews prior studies, theoretical models, and frameworks, thereby determining gaps in current knowledge and providing justification for the current study in BLDE (Deemed to be University).

Chapter 4: **Research Methodology:** This chapter elaborates on the methodological approach used in the study. It includes the research design, approach, sampling methods, population and sample, data collection equipment and techniques, validity and reliability of instruments, data analysis steps, and ethical issues. This provides assurance for the clarity and reliability of the research process.

Chapter 5: Results And Data Analysis: Data Analysis and Interpretation: Chapter four outlines data analysis, interpretation, and findings discussion based on the data obtained. Tables, graphs, and statistical tests are employed to systematically interpret results for each objective and research question

Chapter 6: Findings and Suggestion: The investigation showed that AI is considered advantageous for enhancing instruction, learning, and research at BLDE University. Most of the individuals surveyed had positive attitudes toward the use of AI. A lack of support systems and training were noted as barriers to the implementation of AI. A firm commitment to institutional support and a plan for its use would facilitate a comprehensive approach to better usage of AI.

Chapter 7: Summary, Conclusions, and Recommendations: Summary, Findings, Conclusions, and Recommendations: The last chapter is a summary of the whole thesis, key findings, conclusions from the research, and recommendations for policy, practice, and research. It also indicates the contributions of the research to the literature and practical implications for BLDE (Deemed to be University) and other similar institutions.

Chapter 8: Referees: In this research study, all references have been formatted according to APA 7th edition. The dissertation is informed by scholarly sources that are relevant to AI in teaching, learning, research, and clinical practice. Approximately

40 bibliographic entries have been included to substantiate the research and adhere to academic rigor.

The thesis is concluded with a list of references used throughout the study, maintaining academic honesty, and appendices including questionnaires, Grammar check report, and Plagiarism check report, utilized in the study

CHAPTER: 2

AIMS AND OBJECTIVES

The objective of this research is to evaluate the contribution of Artificial Intelligence (AI) in learning, teaching, research, and clinical practice at BLDE (Deemed to be University), Vijayapura. The research aims to examine the awareness, usage, perceptions, advantages, and difficulties involved in AI among the faculty, students, and clinicians to establish evidence-based suggestions for successful integration of AI into the educational, research, and clinical processes of the university

Specific the study has the following objectives:

Objective 1: Identify current AI applications in teaching and learning at BLDE (DU).

The aim of this evaluation is to assess stakeholders' familiarity with fundamental concepts, definitions, and actual applications of Artificial Intelligence (AI). It seeks to determine how extensive their previous exposure to AI technologies has been, especially in academic and clinical settings. Furthermore, the survey aims to determine the main sources of learning about AI—be it from formal education and training courses, professional seminars, self-study, internet portals, or casual discussion with colleagues. Insights into these areas will aid in framing focused plans for improving AI literacy and integration in relevant fields.

Objective 2: Explore AI's impact on research processes and academic outputs.

This inquiry aims to explore the various AI tools and technologies currently utilized by faculty members in teaching, including AI-based presentation tools, intelligent tutoring systems, automated assessment platforms, and simulation-based learning environments. It also seeks to assess faculty perceptions regarding the effectiveness of these tools in improving teaching quality, fostering student engagement, and enhancing the accuracy of assessments. Furthermore, the study aims to identify common barriers that hinder the integration of AI into teaching practices, such as lack of adequate training, limited technical support, and restrictive institutional policies. Understanding these factors is essential for developing strategies that promote effective and sustainable adoption of AI in educational settings.

Objective 3: Assess AI use in clinical practice with emphasis on patient care and diagnostics.

The purpose of this research is to ascertain the AI-based learning platforms and resources widely utilized by students in academic preparation and subject understanding, including adaptive learning platforms, question banks with AI support, and virtual lab simulation. Additionally, the research aims to assess students' attitudes

toward the effectiveness of AI tools in improving their grasp of subjects, enhancing critical thinking skills, and better performance on exams. Further, the study investigates challenges in students' access to or effective utilization of AI-powered learning materials and resources, such as concerns in terms of cost, digital literacy, and technology infrastructure. Insights into these areas will contribute to informing strategies that facilitate fair and effective AI adoption in students' learning.

Objective 4: Investigate ethical concerns and challenges in AI integration.

Examine ethical issues and challenges in AI integration. This investigation will explore how researchers and students are integrating Artificial Intelligence (AI) into all phases of the research process, such as study design, data analysis, literature reviews, and manuscript preparation. The research will explore the particular AI tools utilized in performing tasks like statistical analysis, prediction modeling, data mining, and systematic reviews, including AI-powered bibliometric platforms and text-mining packages. In addition, the research investigates users' attitudes towards AI impact on research effectiveness, innovation, and quality of research outputs. The study also examines the main challenges and ethical issues in AI adoption, including high software bills, lack of technical skills, data privacy, and lack of institutional encouragement or infrastructure. The findings will inform strategies to advance responsible and productive AI integration in scholarly research.

Objective 5: Recommend strategies for enhancing AI adoption and responsible use.

This research will determine the scope of Artificial Intelligence (AI) technologies in use within healthcare facilities, such as diagnostics, treatment planning, patient monitoring, and hospital administration. Some of these technologies are AI-powered radiology diagnosis systems, electronic health record (EHR) analytics, clinical decision support systems, and robotic surgery platforms. The study also aims to assess clinicians' attitudes toward the influence of AI on diagnostic performance, treatment decision-making, workflow effectiveness, and patient outcomes in general. The study also investigates the ethical, legal, and practical issues arising from the introduction of AI into clinical practice, including data privacy concerns, accountability, transparency of algorithms, and preparedness of the healthcare system. Findings from this research will guide policy for the effective and responsible implementation of AI in medical practice.

CHAPTER: 3

REVIEW OF LITERATURE

Burn and Mutton (2015) Burn and Mutton (2015) point out several important ITE gaps with direct relevance to incorporating Artificial Intelligence (AI) in teaching, learning, research, and clinical practice. One such gap is that there is no shared and clear definition of 'clinical practice,' which contributes to patchy implementation. In the same way, AI uptake can remain thin-skinned without an institutional strategy that outlines its role in education and practice. The review further points to limited research-practice linkage, whereby students receive theoretical knowledge with inadequate chances of applying evidence in actual practice. In AI integration, this gap indicates that exposure to AI tools is not enough—staff and practitioners also need to be adept at interpreting and applying AI-driven insights properly.

Highlight the lack of partnership collaborations, restricted critical inquiry space with research, and inadequate long-term review mechanisms. Their translation into AI integration into BLDE (Deemed to be University) requires collaborative research and implementation measures with faculty, clinicians, researchers, and students. Integration of AI literacy and critical data analysis competencies into the curricula is necessary, in addition to strong monitoring and evaluation systems, to guarantee that AI technologies are contextually appropriate, ethically used, and able to meaningfully improve teaching, learning, research, and clinical practice.

Paranjape et al. (2019) these are a lack of formal AI curricula, restricted faculty experience, insufficiency of training in critical appraisal and the ethical, legal, and social implications (ELSI) of AI, and limited hands-on exposure to real-world usage. Further, the absence of clearly defined competency frameworks denies students clear standards for what they should know and be able to do to effectively interact with AI in healthcare. Together, these deficits inhibit the capacity of medical graduates to critically appraise, responsibly embrace, and confidently utilize AI tools for clinical and research applications.

BLDE (Deemed to be University), it is essential that these weaknesses are addressed in order to produce future-ready healthcare professionals. By creating formal AI curricula, faculty capacity-building, infusing ELSI considerations in training, and hands-on exposure in clinical and research environments, the university can make its graduates technically literate, as well as capable of using AI responsibly and ethically. Establishing clear competency frameworks will further guide this process, enabling BLDE graduates to harness AI effectively for patient care and research while upholding professional and societal values.

Raffort et al. (2020) Raffort et al. (2020) identify some key areas of gap in the adoption of Artificial Intelligence (AI) in vascular surgery that are pertinent to wider clinical practice and medical education at institutions such as BLDE (Deemed to be University). The principal gap lies in the limited familiarity among surgeons with AI concepts, methodologies, and applications that may result in suspicion or ill usage of AI tools in diagnosis, imaging, and surgical planning. The authors also point out that there is a lack of AI-oriented training in surgical curricula, rendering clinicians less prepared to interact with AI technologies confidently and ethically. Moreover, the lack of proper interdisciplinary interaction between surgeons and AI developers tends to lead to tools with minimal clinical relevance and usability, highlighting the need for joint research and development efforts involving clinicians, computer scientists, and biomedical engineers.

Other important gaps are difficulties with data availability and normalization, outstanding ethical and legal issues like patient consent and algorithmic bias, and limited assessment of AI tools in actual clinical environments. Furthermore, the absence of formalized feedback structures for surgeons obstructs the development of fully formal AI training and evaluation. For BLDE, these gaps need to be filled through the construction of strong data infrastructures, AI literacy and training incorporation into courses of study, strong ethical and regulatory policy frameworks, interdisciplinary collaboration, and systematic pilot tests to provide safe, effective, and responsible AI usage in vascular and more general clinical practice.

Recht et al. (2020) point to a number of significant gaps in the adoption of Artificial Intelligence (AI) in radiology of wider importance for clinical practice, applicable to such institutions as BLDE (Deemed to be University). One of the biggest gaps is the inadequate incorporation of AI tools into established clinical workflows, with poor interoperability with Picture Archiving and Communication Systems (PACS) and Electronic Health Records (EHRs). Furthermore, numerous AI models are not validated in varied clinical environments, making it challenging to ensure generalizability and effectiveness when implemented on local patients. The authors also point to the lack of well-defined regulatory routes and guidelines for deploying AI, which causes confusion among clinicians and administrators regarding safety, effectiveness, and continued monitoring requirements.

Other notable gaps include restricted radiologist knowledge of AI algorithms and their limitations, potentially undermining diagnostic accuracy, and the danger of AI

reinforcing current healthcare biases as a result of unrepresentative training data. Recht et al. (2020) further highlight ethical and legal ambiguity surrounding accountability, absence of strong cost-effectiveness analysis, and clinician culture resistance to adopting AI as a collaborator. For BLDE, these gaps mean that filling them requires the establishment of AI literacy programs, regulatory and assessment frameworks, inclusive and proven datasets, and an organizational culture for successful, responsible, and ethical incorporation of AI into radiology and overall clinical practice.

Yin, Ngiam, and Teo (2021) outline a number of key gaps in Artificial Intelligence (AI) integration into actual clinical practice, with significant implications for institutions such as BLDE (Deemed to be University). One key gap is the narrow application of AI in day-to-day clinical workflows, though promising research findings. Challenges in doing so consist of workflow integration, clinician acceptance, and lack of evidence on real-world effectiveness, including patient outcomes, workflow efficiency, and cost-effectiveness. Additionally, many AI models lack external validation across diverse populations, raising concerns about generalizability and bias when applied to different patient groups.

Other relevant gaps are also pointed out in the review, such as limited algorithm transparency and interpretability, unsettled ethical and legal concerns like data privacy and accountability, and the lack of proper AI training and education for healthcare providers. The authors further identify limited multidisciplinary engagement in AI development and insufficient standardized regulatory guidelines for assessment, approval, and monitoring. For BLDE, this calls for integrating AI literacy programs, setting up ethical and governance structures, testing AI models on local data, engaging clinician-developer collaboration, and having strong regulation and assessment systems to achieve responsible, effective, and sustainable AI adoption in clinical settings

Mosch et al. (2022) recognize some key gaps in integrating Artificial Intelligence (AI) into medical education, research, and clinical practice, relevant to universities such as BLDE (Deemed to be University). One of the key gaps is the unpreparedness of medical professionals to innovate in response to AI-driven role and responsibility changes, as AI becomes more prevalent in automating diagnostic and administrative tasks. The research also points towards the scant attention paid to AI skills, data analysis, digital literacy, and ethics within existing medical curricula, rendering future

doctors unprepared to work effectively with AI systems. Moreover, the social, ethical, and relational impacts of AI—e.g., effects on doctor-patient relationships, professional identity, and inter-professional trust—find inadequate coverage, indicating necessary socio-ethical incorporation into medical education.

Some of these gaps are disparate access to AI facilities and training, limited inter-disciplinary collaboration in developing AI tools, lack of clear institutional approaches and leadership to integrate AI, and emotional or psychological issues in the clinicians regarding technological change. The research also highlights the lack of ongoing assessment and feedback loops to track the performance of AI and its unintended effects. For BLDE, filling these gaps necessitates integrating AI literacy into curricula, promoting fair access to resources, generating collaborative partnerships, developing definite institutional frameworks, offering change management facilitation, and instituting intensive evaluation processes to support responsible, effective, and sustainable AI use in educational and clinical settings.

Ivaner et al. (2022) identify several critical gaps in the integration of Artificial Intelligence (AI) into medical education, with direct relevance to institutions like BLDE (Deemed to be University). A major gap is the absence of structured AI education within current curricula, leaving students and faculty with limited knowledge, misconceptions, and unrealistic expectations about AI's capabilities. The study also highlights insufficient faculty preparedness to teach AI-related content, as many educators lack expertise or confidence in AI, data science, and digital health. Furthermore, there are no clearly defined AI learning objectives or competency frameworks, resulting in fragmented and inconsistent training approaches across undergraduate and postgraduate programs.

Other significant gaps include minimal practical exposure to AI tools during training, inadequate coverage of ethical, legal, and social implications (ELSI) of AI use, and student anxiety regarding AI as a potential replacement rather than a collaborative tool. The study also points to broader institutional challenges, including limited strategic planning, infrastructure, and policy support for AI integration. For BLDE, addressing these gaps requires implementing structured AI curricula, building faculty capacity, embedding practical and simulation-based AI training, incorporating ELSI considerations, clarifying learning outcomes, and strengthening institutional readiness to ensure graduates are equipped for responsible and effective AI use in clinical practice and research.

Buabbas et al. (2023) recognize a number of key gaps in perceptions and readiness of medical students to Artificial Intelligence (AI), with direct institutional implications for an entity like BLDE (Deemed to be University). A significant gap exists in the level of awareness and understanding of AI, where most students do not have basic knowledge of AI technologies, their applications, and limitations. The research also identifies a gap between high interest among students in AI and the scarce provision of formal AI courses or modules, which reflects the need to establish formal AI education within the curriculum without delay. Some of the students also feared that AI might replace clinical jobs, showing the need to present AI as a supportive tool that augments human clinicians rather than replaces them.

Other notable gaps consist of inadequate student confidence in critically evaluating AI output and comprehending ethical, legal, and social implications (ELSI), as well as insufficient opportunities for experiential, hands-on practice using AI tools. The research further highlights a lack of faculty preparedness and instructional resources, as well as institutional policies and strategic plans to facilitate sustainable AI integration. To fill BLDE's gaps, developing systematic AI curricula, integrating experiential and simulation-based learning, faculty capacity building, integrating ELSI instruction, and developing institutional frameworks to prepare students as capable, confident, and ethically informed professionals equipped to engage effectively with AI technologies are needed.

Bays et al. (2023) point out some key areas of gap in the incorporation of Artificial Intelligence (AI) into managing obesity, with relevance to institutions such as BLDE (Deemed to be University). One of the significant gaps is the relative paucity of AI solutions specifically developed and tested for obesity treatment, with the ability to integrate sophisticated behavioral, genetic, and metabolic information to inform customized treatment plans. The research also focuses on the lack of real-world data regarding the clinical efficacy, long-term outcomes, and cost-effectiveness of AI interventions, calling for local studies that evaluate AI tools in various patient populations and healthcare settings.

Other important gaps are disorganized and non-standardized data sets, interoperability issues, and insufficient clinician education on AI interpretation and use. Bays et al. (2023) also identify ethical and privacy issues, the absence of patient-centered and culturally aware AI design, and the lack of simple regulatory and reimbursement models, all of which impede sustainable adoption. To fill these gaps for BLDE means

creating validated AI tools, improving clinician literacy, developing integrated data infrastructures, integrating ethical and patient-focused considerations, and developing regulatory advice to facilitate proper, effective, and equitable AI integration into obesity care and general clinical practice

Wang, Tang, and Tu (2024) recognize a number of glaring gaps in integrating Artificial Intelligence (AI) in medical education, that have direct implications for institutions such as BLDE (Deemed to be University). One of the glaring gaps is the lack of formal AI education in existing curricula that leaves teachers and students with limited exposure, misconceptions, and unrealistic assumptions regarding the ability of AI. It also reports on inadequate faculty readiness to deliver AI-related material since most lecturers are not knowledgeable or confident in AI, data science, and digital health. Additionally, there are no well-defined AI learning goals or competency models that lead to dispersed and inconsistent training methods within undergraduate and postgraduate courses.

Additional substantial gaps are limited practical experience with AI tools in training, insufficient treatment of ELSI of AI application, and student stress over AI as a substituting instead of augmenting resource. The research further identifies larger institutional issues such as insufficient strategic planning, infrastructure, and policy foundation for AI incorporation. For BLDE, filling these gaps involves instituting systematic AI curricula, enhancing faculty capabilities, incorporating practical and simulation-based AI training, including ELSI considerations, making clear learning outcomes, and improving institutional preparedness so that graduates will be ready for ethical and efficient use of AI in clinical practice and research.

Hamet and Tremblay (2017) mention the transformative effect of artificial intelligence (AI) in medicine after it evolved from early rule-based systems to advanced machine learning and deep learning approaches. The authors suggest that AI has become increasingly embedded in clinical decision support, diagnostic imaging, pharmaceutical discovery, and personalized treatment options. By leveraging vast amounts of clinical and biomedical data, AI has been shown to improve the accuracy of diagnosis, reduce errors, and optimize therapeutic interventions. Significantly, the article points out how greater access to big data and computational processing has accelerated the adoption of AI across healthcare domains.

At the same time, caution that while there are great opportunities with AI, concerns regarding ethical implications, data security, validation, and clinician acceptance

remain. They point out that AI systems must undergo rigorous testing before they can be integrated into clinical practice with transparency and accountability of decision-making. Furthermore, the article stresses that alongside the involvement of AI technologies, there should be collaboration between health professionals and that human expertise continues to prevail over results interpretation and patient-centered care. Overall, their review positions AI as a powerful yet complementary tool, which, if introduced responsibly, can reshape the destiny of medicine.

Varghese et al.(2024) discuss the position of artificial intelligence in surgery, pointing to its use in preoperative risk assessment, intraoperative assistance, and postoperative surveillance. They point out developments like computer vision, robotics, and multimodal AI models that combine imaging, surgical video, and clinical information to enhance precision and inform decision-making. These developments are regarded as promising directions towards increasing precision, lowering complications, and enhancing operating outcomes.

Nonetheless, the authors also emphasize major challenges such as limited access to high-quality, standardized data and a necessity for more transparency, explain ability, and regulation. They warn that AI in surgery should be introduced cautiously, while clinicians retain control and accountability. For safe implementation, they advocate stricter collaborations between surgeons and the developers of AI, along with a move towards incorporating AI literacy into surgical training and practice.

Asan, Bayrak, and Choudhury (2020) examine human trust in AI systems in healthcare, particularly from the clinician's point of view. They look into how clinicians experience, adopt, or refute AI-based decision aids, and how it is determined. Their framework highlights that trust is not dichotomous but comprises aspects like reliability, transparency, understandability, and contextual suitability. The authors survey evidence that reveals clinicians are more likely to trust AI when they are able to see how decisions are arrived at, when performance is stable, and when systems express uncertainty or limitations clearly.

Concurrently, Asan et al. identify clinician trust barriers: black-box models' obscurity, uncertainty regarding responsibility and accountability, fear of deskilling, workflow interruption, and liability if AI fails. To encourage trustworthy AI adoption, they contend system designers need to include explain ability, user feedback loops, and means for clinicians to see, override, or query algorithmic output. In addition, they advocate for incorporation of trust evaluation into AI testing activities and for further

interdisciplinary research that incorporates human factors, ethics, and AI/ML methodology.

Hamet and Tremblay (2017) Hamet and Tremblay (2017) review the fast development of artificial intelligence in medicine, from early expert systems based on rules to the present usage of machine learning and deep learning models. They identify the expanding use of AI in diagnostics, clinical decision support, drug discovery, and personalized medicine, as big data availability and augmented computing power have improved its applications enormously. The authors highlight how these instruments can enhance diagnostic precision, minimize medical mistakes, and assist with individually tailored treatment approaches.

Paradoxically, while they recognize the technical feasibility of the strategy, they warn that its integration into the healthcare sector is not without obstacle. Ethical considerations, privacy of data, opaqueness, and the necessity for strict clinical validation are all significant stumbling blocks. Hamet and Tremblay emphasize that AI must be a complement to medical judgment, with clinicians still playing the central role in interpreting outcomes and providing patient-centered care. They conclude that the wise uptake of AI has tremendous potential to reshape medical practice.

Recht et al. (2020) discuss integrating artificial intelligence into radiology and how it can streamline efficiency, accuracy, and workflow management. They point out that AI can assist in image interpretation and workload reduction but that its successful integration hinges on solving problems of dataset bias, algorithm validation, and getting regulatory approval. The authors also insist that radiologists should remain at the core and leverage AI as an auxiliary tool and not a substitute.

The article presents essential recommendations for adopting safety, such as clear evaluation criteria, interdisciplinary teamwork, and the phased deployment of AI in supporting functions such as triage and second reads. They also advocate for education and training programs for radiologists to better grasp AI systems so that they are held accountable and trusted. In general, the authors place AI as an enriching addition to radiology, as long as its implementation is conservative, ethical, and clinically proven.

Cary et al. (2024) offer an educational model to educate nurses about the implementation of artificial intelligence in clinical practice and research with a thrust toward promoting health equity. They highlight the importance of nurses acquiring AI

literacy, data competencies, and awareness of ethical issues since nurses are critical to ensuring that AI technologies are successful in serving diverse patient groups.

The authors point to areas like bias reduction, inclusiveness, and transparency and state that if properly educated, AI cannot help but exacerbate health disparities. With the incorporation of AI content into nursing curricula and inter professional collaboration, they suggest nurses can be best able to utilize AI responsibly and promote equitable health results.

Haug and Drazen (2023) give a broad overview of artificial intelligence (AI) and machine learning (ML) in clinical medicine, outlining their journey from early rule-based systems to present-day utilization in diagnosis, treatment planning, and decision support. They point out the revolutionizing ability of AI/ML in diagnosing with increased accuracy, tailoring treatment options, and enhancing patient outcomes. The authors review multiple AI methodologies, such as supervised and unsupervised learning, and their incorporation within clinical workflows. The authors also consider the challenges in the application of AI/ML in healthcare, e.g., data quality, algorithmic transparency, and the necessity of proper validation.

In addition, Haug and Drazen underscore the need for cooperation among clinicians, data scientists, and policymakers to guarantee that AI/ML can be used ethically and effectively in medicine. They propose the creation of standardized protocols, stringent regulatory frameworks, and ongoing training for physicians to master the intricacies of AI/ML technologies. The authors conclude that although AI/ML are poised to revolutionize clinical practice, their effective integration needs to be carefully weighed by technical, ethical, and practical considerations.

Lareyre et al. (2020) discuss the possible role of artificial intelligence (AI) in upgrading the education of vascular surgeons. They point out that AI can be used to create novel teaching technologies, like intelligent tutoring systems, virtual facilitators, and robotic support that can enable adaptive and personalized learning experiences. The authors underline that these AI-based tools can aid in the learning of intricate surgical skills and enhance clinical decision-making by providing instantaneous feedback and simulation-based training.

The authors also touch on the issues and concerns regarding the adoption of AI within surgical education. They discuss the need to make sure that AI systems are not only designed to augment, not supplant, human expertise but that they are implemented in a manner that preserves the key human aspects of care for patients. They also address

the necessity of continuous research in order to assess the effectiveness of AI-based teaching interventions and determine best practices for integrating them into medical curricula. Through deliberately integrating AI into the training of surgeons, Lareyre et al. assert that the training of vascular surgeons can be greatly improved, with a resulting impact on patient outcomes.

Schwendicke et al. (2023) created a core curriculum for the improvement of artificial intelligence (AI) literacy for dental professionals. Addressing the swift adoption of AI in oral health, the authors specified a knowledge and skill gap among the providers to evaluate dental AI applications critically and apply them. By expert interviews and a Delphi consensus procedure, they defined a curriculum that included four main areas: theoretical AI concepts, dental practical applications, metrics for evaluation and their interpretation, and ethics such as explain ability and governance. The vast majority of learning outcomes were classified at the level of knowledge to make them accessible to undergraduate and postgraduate students alike.

The designed curriculum focuses on the significance of comprehending the principles of AI, acknowledging its relevance in dental practice, and critically analyzing its contribution to patient outcomes. Through these educational elements, the authors seek to empower dental professionals with the ability to contend with the changing environment of AI in oral health, promoting thoughtful and aware use of AI technology.

Brot and Mango (2023 discuss the deployment of artificial intelligence (AI) in breast ultrasound imaging, with a focus on its potential to improve diagnostic correctness as well as workflow. They also point out AI use in different facets of breast ultrasound, such as lesion detection, characterization, and evaluation of axillary lymph node status. The authors touch upon the design and validation of AI algorithms, citing their capacity to help radiologists interpret complicated imaging information so that diagnostic confidence and efficiency improve.

The article also discusses the challenges and issues surrounding AI implementation in clinical practice. These include the necessity of robust validation across heterogeneous populations, integration with existing clinical work flow, and ensuring that AI tools augment and not replace human skill. Brot and Mango conclude by calling for further research and collaboration with a view to maximizing AI application in breast ultrasound in the interest of enhancing patient outcomes and increasing access to quality breast cancer care.

Krittanawong (2023) provides offers an in-depth discussion of artificial intelligence (AI) in clinical practice, focusing on its revolutionary influence in multiple medical subspecialties. The book explores the incorporation of AI technologies in diagnosis, clinical decision-making, and prediction of disease, prevention, and enabling precision medicine. It summarizes the basics of big data and AI in medicine and addresses current uses and their potential benefits to healthcare provision.

Aside from presenting the developments, the author also tackles the issues related to AI deployment, such as ethical issues, biases, and the necessity for strict validation. By synthesizing existing research and expert views, Krittanawong provides an important reference for practitioners wishing to learn and navigate the changing AI environment in medicine. The book is a manual for the incorporation of AI technologies in clinical practice in order to improve patient outcomes and automate healthcare operations.

CHAPTER: 4

RESEARCH METHODOLOGY

4.1 Research design (mixed-methods)

The present research follows a mixed-methods research design, where both quantitative and qualitative methods are combined to have a holistic comprehension of perceptions, practices, and challenges in integrating Artificial Intelligence (AI) into medical education and clinical practice. The reason behind the implementation of a mixed-methods design is the aspect of data triangulation that it offers, which increases validity and allows for a more detailed interpretation of findings

Quantitative Component: A standardized questionnaire was created derived from previous validated instruments and literature) aimed at medical students, educators, and clinicians. The questionnaire contained Likert-scale items asking about perceptions of AI, preparedness for AI integration, perceived advantages (e.g., efficiency, accuracy, personalization), and disadvantages (e.g., ethical concerns, data privacy). Descriptive statistics and inferential tests (e.g., Chi-Square Test, t-tests) were applied to analyze the responses.

Qualitative Component: In addition to the quantitative results, semi-structured interviews were carried out with some of the participants in the stakeholder groups. The interviews examined in detail the participants' experience of AI tools, their views on its adoption, and perceived obstacles in education and clinical environments thematic analysis was used to search for recurring patterns and produce rich insights. By integrating the two approaches, this design permits cross-validation of data and enables an overall appreciation of the impact AI is having on learning environments and clinical workflows. The combined findings are likely to guide institutional strategies, curriculum development, and policy making for appropriate AI integration in healthcare education and practice.

4.2 Study Setting: BLDE (Deemed to be University), Vijayapura, Karnataka

Institutional Overview: BLDE (Deemed to be University) was established on 29 February 2008 by the Bijapur Lingayat District Educational Association with the aim of addressing the healthcare and educational needs of North Karnataka. Its flagship institution, Shri B. M. Patil Medical College, Hospital & Research Centre, was originally founded in 1986 and later became an integral part of the Deemed University structure, contributing to its academic and clinical excellence.

Campus and Academic Structure: BLDE (Deemed to be University) was founded on 29 February 2008 by the Bijapur Lingayat District Educational Association with a vision to meet the healthcare and educational demands of North Karnataka. Its premier institution, Shri B. M. Patil Medical College, Hospital & Research Centre, was initially established in 1986 and subsequently became a part of the Deemed University framework, paving the way for its excellence in academics and clinical.

Accreditations and Rankings: BLDE (Deemed to be University) is located on a 71.2-acre unitary campus in Vijayapura (previously Bijapur) and has a teaching hospital with more than 1,200 beds, over 10 intensive care units, over 20 operating rooms, and a variety of clinical departments like radiology, cardiology, urology, neurology, and nephrology. The teaching constituency Shri B. M. Patil Medical College has 24 teaching departments, runs an MBBS course with more than 250 seats, offers postgraduate training in various specialties, and has doctoral (PhD) programs in numerous fields.

Research Infrastructure & Collaborations: BLDE (Deemed to be University) has invested immensely in research capabilities, with a Centre for Advanced Medical Research, Central Research Laboratory, Skills and Genetics Laboratories, and a Vascular Physiology & Medicine facility. The university has signed more than 60 national and international Memoranda of Understanding (MoUs) and promotes institutional research actively, with over 1,900 publications and an H Index of 37. BLDE also engages with international institutions, such as Emory University (USA) and the University of Manitoba (Canada), and is involved with the UNESCO UNITWIN program, showing its strong research excellence and international partnership spirit.

Student and Residential Environment the BLDE (Deemed to be University) campus has well-rounded residential facilities, with undergraduate, postgraduate, NRI, male, and female students each having separate hostels. The campus has a set of amenities for student life, including a well-facilitated library, virtual classrooms, cafeteria, gymnasium, and indoor stadium, swimming pool, banking with ATMs, and an on-campus police outpost for ensuring the safety of students.

Relevance for This Study Being a medical university with both its teaching and clinical arms in a resource-restricted area, BLDE DU offers a perfect environment to investigate the incorporation of artificial intelligence in medical education and clinical practice. Its combination of undergraduate to doctoral programmer, sprawling

healthcare infrastructure, and dynamic research environment makes it an appropriate place for ascertaining student and faculty attitudes, preparedness, and instructional outcomes in terms of AI implementation.

4.3 Population and Sample Size

The study population under consideration included undergraduate and postgraduate medical students, and teachers from different departments of BLDE (Deemed to be University), Vijayapura, Karnataka The total accessible population including:

- MBBS students of all years (~900 in total, with a representative subset taken into account)
- Postgraduate medical students (300+)
- Medical and clinical faculty (200+)

200 questionnaires were administered using a purposive sampling technique for representation among the most important stakeholder groups. Of these, 121 completed questionnaires were collected, with an overall response rate of 60.5% of the target sample.

The last sample of 121 participants consisted of:

- Undergraduate medical students
- Postgraduate medical students
- Faculty members from pre-clinical, para-clinical, and clinical departments

This mixed sample allowed the research to obtain both quantitative general insights and qualitative detailed data concerning perceptions, preparedness, and experience associated with Artificial Intelligence (AI) integration in medical education and clinical practice.

4.4 Data Collection Tools and Their Validation

In order to explore the role of Artificial Intelligence (AI) in instruction, learning, research, and clinical practice at BLDE (Deemed to be University), a standardized questionnaire was framed after an in-depth review of already validated tools and recent literature

Tool Composition

The questionnaire included sections on:

Demographics: Age, role (student, faculty, and clinician), department, level of experience

Awareness and Readiness for AI: Questions evaluating level of exposure to AI technologies and willingness to me brace them

Perceived Uses and Barriers: Items determining perceived effect on education, clinical practice, and research

Patterns of Use: Frequency and purposes of AI tool use

Attitudinal Scales: *Trust in AI systems, ethical issues, and receptiveness to future AI incorporation*

A 5-point Likert scale was the main choice for quantitative items, supported by open-ended questions to obtain qualitative data.

- Content validity was ascertained through discussion with a group of experts in medical education, clinical practice, and AI technology at BLDE University
- The tool was pilot-tested with a representative subset of the participants to assess clarity, relevance, and comprehensiveness, resulting in minor adjustments.
- Cronbach's alpha was used to test reliability, with values well above the acceptable level ($\alpha > 0.7$), reflecting good internal consistency.
- The survey leveraged widely used validated measures and frameworks to ensure construct validity.

The process of rigorous development and validation guaranteed the suitability of the questionnaire for extracting reliable and meaningful information regarding AI integration in the educational and clinical environments of BLDE DU

4.5 Data Collection Procedure

The data collection procedure for this research was planned carefully to have detailed and accurate information about the incorporation of Artificial Intelligence (AI) into teaching, learning, research, and clinical practice at BLDE (Deemed to be University).

Sampling and Recruitment: Undergraduate and postgraduate medical students, faculty members, and clinicians actively involved with AI-related clinical or educational activities were selected through purposive sampling and invited to participate. Recruitment invitations were dispatched via institutional email and notice boards to achieve optimal reach.

Administration of Data Collection Instruments: The main data collection instrument, a standardized questionnaire, was sent electronically (using secure Google Forms) and hardcopy to meet the preferences of participants. The questionnaire had sections assessing AI knowledge, usage, attitudes, and perceived difficulties.

Data Collection Timeline and Follow-Up: The data collection spanned two months, allowing ample time for participation. Regular reminders were sent to encourage timely completion of questionnaires. Interviews were scheduled flexibly to accommodate participant availability.

Data Management and Confidentiality: All collected data were securely stored and anonym zed to protect participant identity. Access was restricted to authorized research team members, ensuring data integrity and compliance with ethical research practices.

This meticulous data collection procedure ensured the acquisition of valid, reliable, and rich data to evaluate AI's evolving role in medical education and clinical practice at BLDE DU, supporting evidence-based recommendations for future integration.

CHAPTER: 5

RESULTS AND DATA ANALYSES

Data gathered was initially analyzed using frequency and percentage distributions based on descriptive statistical analysis. Descriptive statistical analysis facilitated summarization of the demographic profile of the respondents and identification of patterns in AI use across different dimensions like teaching, learning, research, and clinical practice.

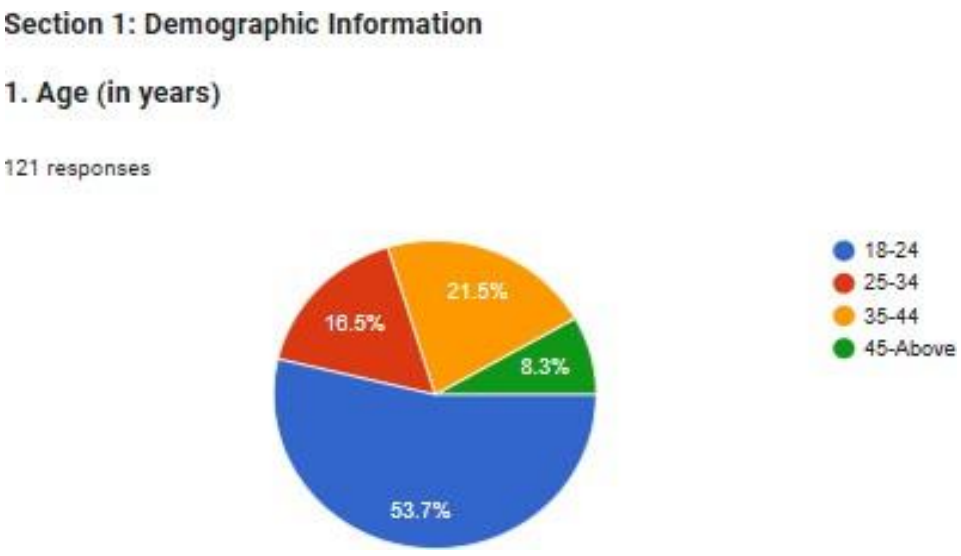
Software Used:

Data analysis was done employing statistical software like IBM SPSS, Microsoft Excel to make it accurate and reliable.

5.1 Data Analysis

Demographic Information (Table.1)

1. Age (in years)		Frequency	Percent
Valid	18-24	65	53.7
	25-34	20	16.5
	35-44	26	21.5
	45-Above	10	8.3
	Total	121	100.0



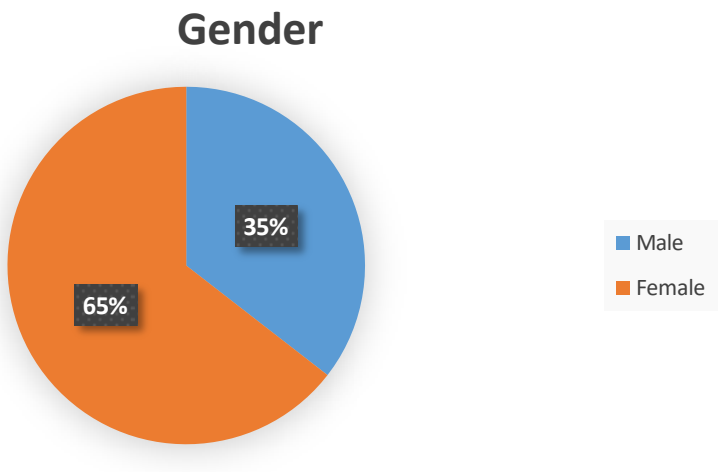
Demographic Information Age (Figure--2)

Age group distribution among the **121** participants reveals that most, **53.7% (65 people),** and fall in the 18–24 years category, implying that the majority of the participants are probably undergraduate or early postgraduate students. The 25–34 years category **represents 16.5% (20 persons)** as early-career professionals or

postgraduate students. Furthermore, **21.5% (26 people) are aged 35-44 years,** which indicates veteran faculty members or clinicians, whereas **8.3% (10** people) are 45 years and older, which reflects veteran professionals with rich experience. This indicates that the study is representative of both young and experienced individuals' views, giving a fair idea regarding the use of AI in teaching, learning, research, and clinical practice in BLDE (Deemed to be University)

Gender (Table.2)

2. Gender:		Frequency	Percent
Valid	Female	43	35.5%
	Male	78	64.5%
	Total	121	100.0%

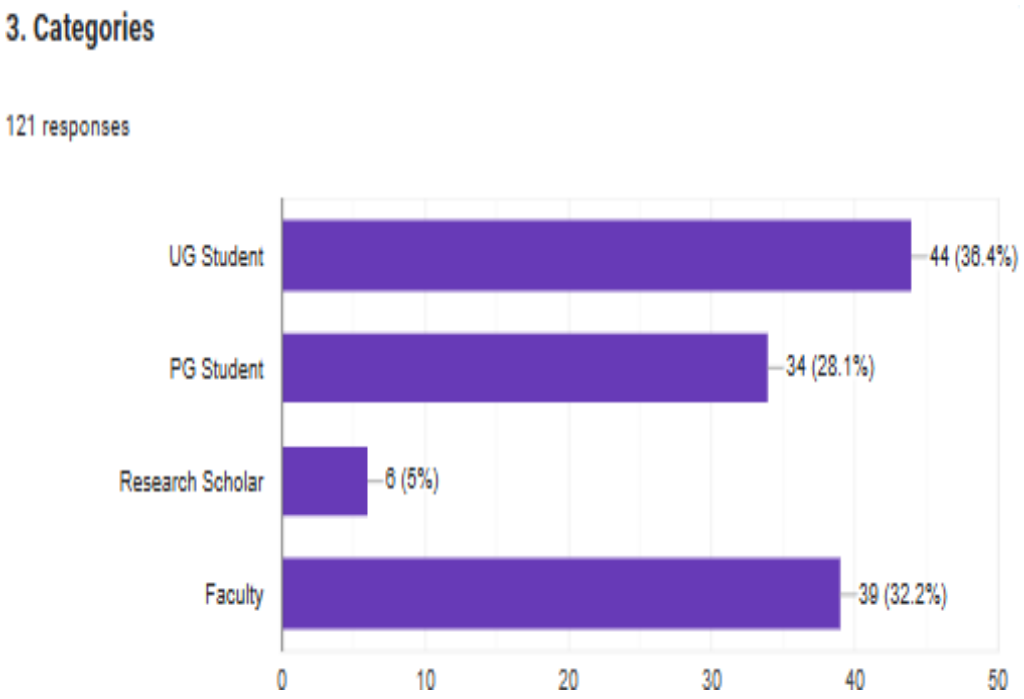


Demographic Information Gender (Figure--3)

The gender makeup of the 121 respondents indicates that **64.5% (78)** are male and **35.5% (43)** are female. This reflects a greater involvement of male respondents in the research, although both sexes are represented.

Demographic Information Categories (Table.3)

3 .Categories		Frequency	Percent
Valid	Faculty	38	31.4
	PG Student	34	28.1
	Research Scholar	5	4.1
	UG Student	44	36.3
	Total	121	100.0



Demographic Information Categories (Figure--4)

The distribution of the 121 participants by category reveals the biggest group**, 36.3% (44 participants),** are undergraduate (UG) students. Next in rank are **31.4% (38 participants)** who are staff working in teaching and clinical practice? **28.1% (34 participants)** are postgraduate (PG) students, reflecting strong representation from senior learners. A minor group, **4.1% (5 participants),** are research scholars, adding more academic voices to the study.

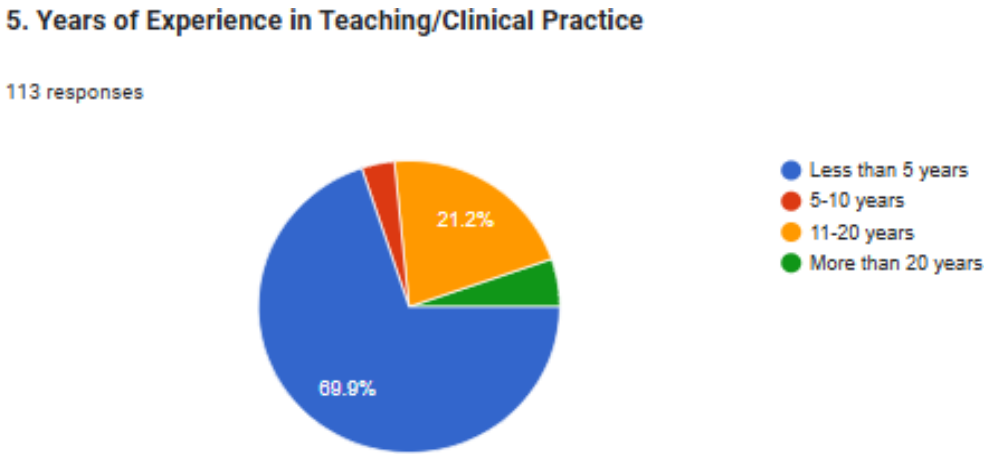
Demographic Information Departments (Table.4)

4. Departments	Frequency	Percent
Anesthesiology	2	1.7
Biochemistry	4	3.3
Cardiology	4	3.3
Community Medicine	4	3.3
Dermatology	5	4.1
E.N.T.	6	5.0
Forensic Medicine	4	3.3
General Medicine	4	3.3
Geriatrics	2	1.7
Human Anatomy	5	4.1
Human Physiology	4	3.3
MBBS	38	31.4
Microbiology	5	4.1
Orthopedics	2	1.7
Pathology	4	3.3
Pediatrics	7	5.8
Pharmacology	6	5.0
Physiology	5	4.1
Respiratory Medicine	2	1.7
Surgery	6	5.0
Urology	2	1.7
Total	121	100.0

Respondents span a cross-section of departments in BLDE (Deemed to be University) to ensure varied perspectives on the use of AI. The majority, 31.4% (38 respondents), are in the MBBS category, indicating the participation of students in the field of medicine. Other departments like Pediatrics (5.8%), E.N.T. (5.0%), Pharmacology (5.0%), and Surgery (5.0%) are also well represented. Smaller departments such as Anesthesiology, Geriatrics, Orthopedics, and Urology (all between 1.7% and 4.1%) also provide specialized viewpoints from multiple areas of medical education and clinical practice.

Years of Experience in Teaching/Clinical Practice (Table.5)

5.Years of Experience in Teaching/Clinical Practice		Frequency	Percent
Valid	11-20 years	24	19.8
	5-10 years	4	3.3
	Less than 5 years	87	71.9
	More than 20 years	6	5.0
	Total	121	100.0

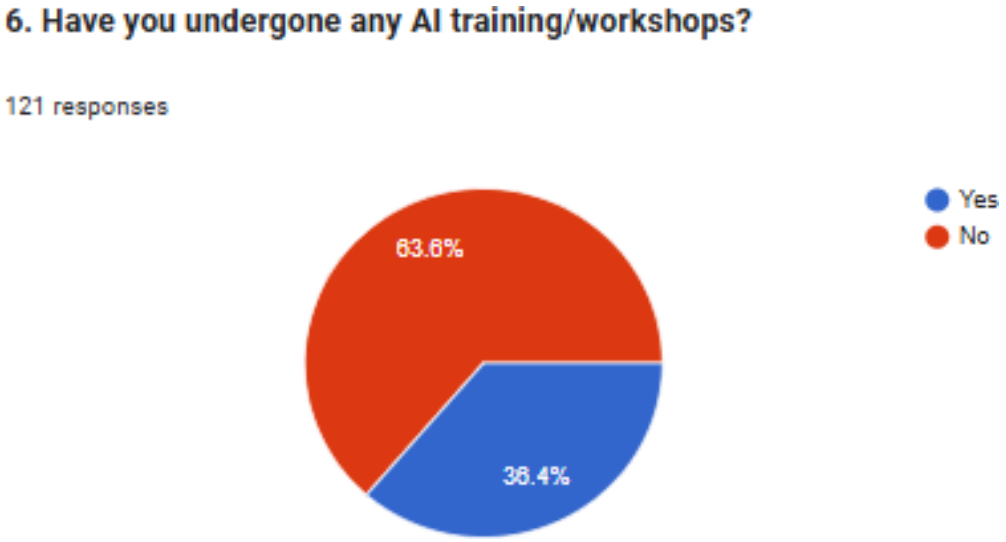


Years of Experience in Teaching/Clinical Practice (Figure--5)

Most of them, 71.9% (87 persons), have 5 years or less of teaching or clinical experience, suggesting that recent graduates and students comprise the bulk of the sample. 19.8% (24 persons) have 11–20 years' experience, reflecting a middle level of proficiency. 5.0% (6 persons) have over 20 years' experience, reflecting that advanced practitioners are a minority in the group. The age group of 5–10 years comprises 3.3% (4 people), indicating minimal representation of mid-career professionals

Have you undergone any AI training/workshops (Table.6)

6. Have you undergone any AI training/workshops		Frequency	Percent
Valid	No	77	63.6
	Yes	44	36.4
	Total	121	100.0

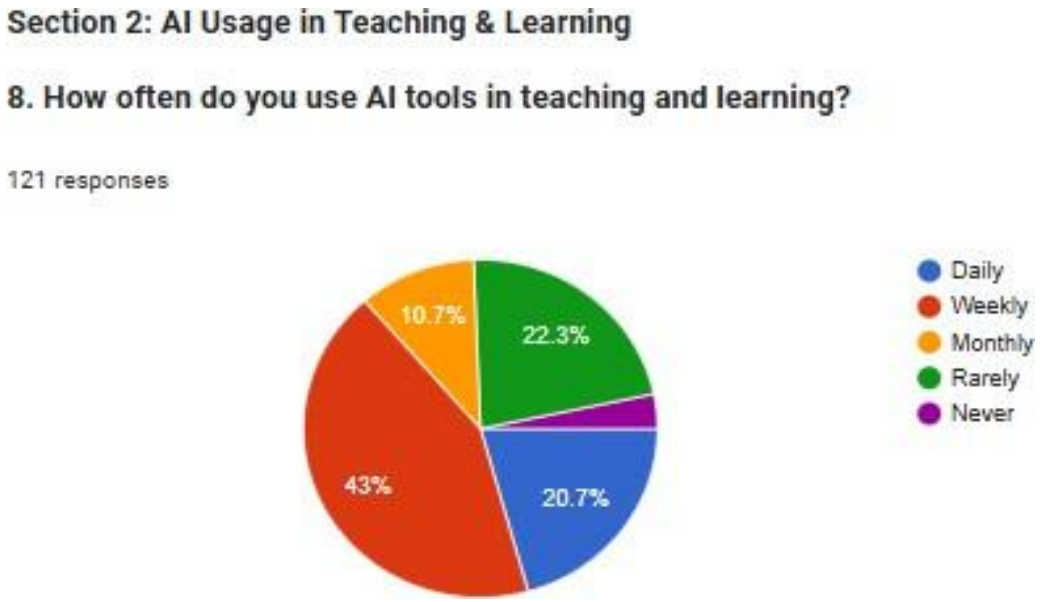


Have you undergone any AI training/workshops (Figure--6)

Most respondents, **63.6% (77 people),** have never attended any AI workshops or training, whereas **36.4% (44 people)** have attended workshops and training. This indicates a requirement for more training opportunities to improve the level of AI knowledge and skill.

Section 2: AI Usage in Teaching & Learning. (Table.7)

8. How often do you use AI tools in teaching and learning?		Frequency	Percent
Valid	Daily	25	20.7
	Monthly	13	10.7
	Never	4	3.3
	Rarely	27	22.3
	Weekly	52	43.0
	Total	121	100.0

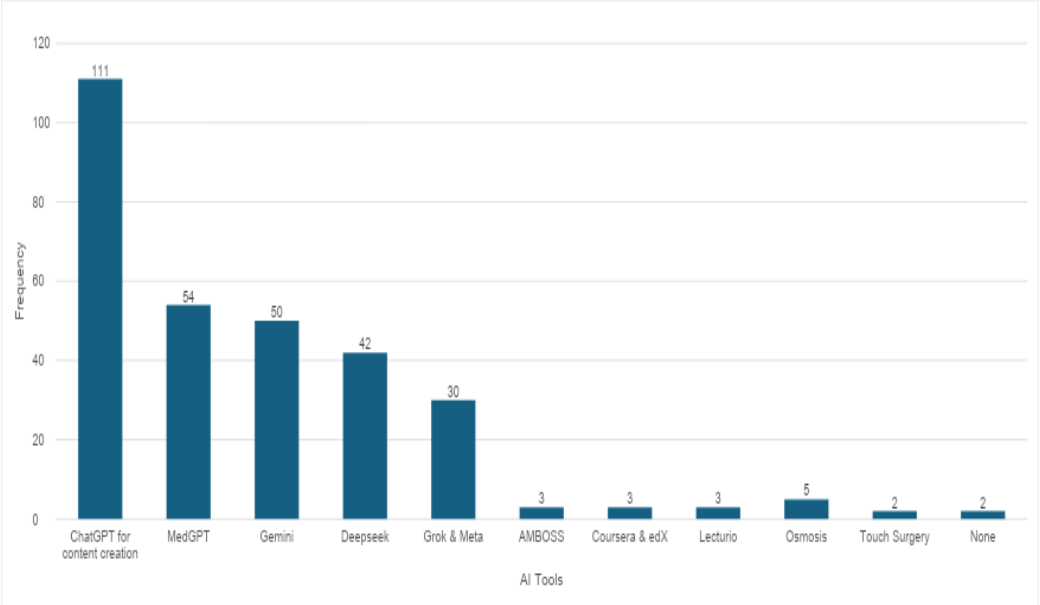


AI tools in teaching and learning (**Figure--7)**

The use frequency of AI tools in instruction and learning indicates that the majority, **43.0% (52 respondents),** use AI tools weekly. Also, **20.7% (25 respondents**) use them daily, and smaller portions of respondents use them occasionally **(22.3%), monthly (10.7%), or never (3.3%),** which reveal differing degrees of usage among the respondents

9. Which AI tools do you use in teaching and learning? (Table.8)

AI Tool	Frequency	Percent
ChatGPT for content creation	114	94.2
MedGPT	57	47.1
Gemini	54	44.6
Deepseek	49	40.5
Grok & Meta	30	24.8
AMBOSS	3	2.5
Coursera & edX	3	2.5
Lecturio	3	2.5
Osmosis	4	3.3
Touch Surgery	2	1.7
None	2	1.7

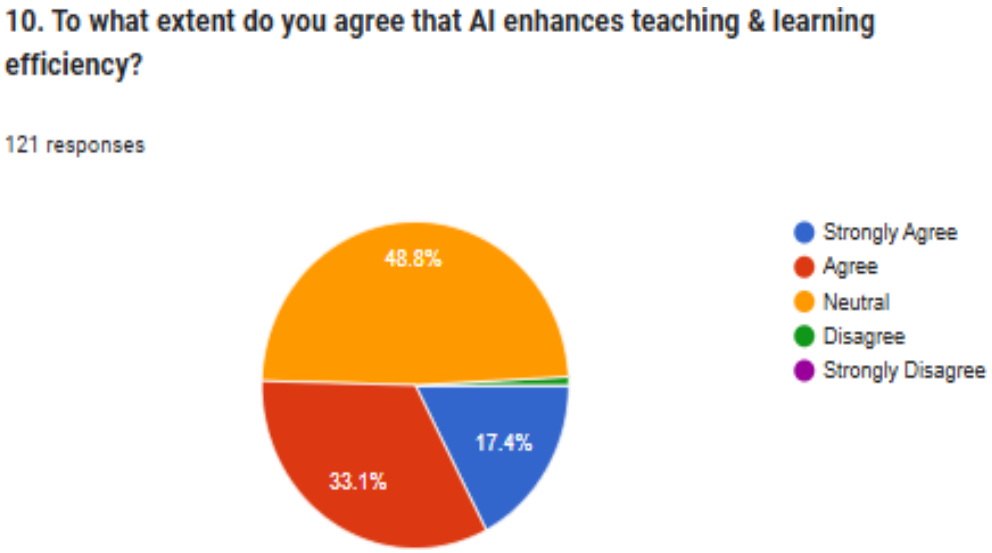


AI tools do you use in teaching and learning (Figure--8)

Amongst the AI tools employed for teaching and learning, the most popular is ChatGPT for content development, which is utilized by **94.2% (111 respondents).** Other tools, including **MedGPT (47.1%),** Gemini **(44.6%),** and Deepseek **(40.5%),** are also frequently used, whereas tools like AMBOSS, Courser & edX, and Lecturio are used by fewer respondents

10. To what extent do you agree that AI enhances teaching & learning efficiency? (Table.9)

To what extent do you agree that AI enhances teaching & learning efficiency?		Frequency	Percent
Valid	Agree	40	33.1
	Disagree	1	0.8
	Neutral	59	48.8
	Strongly Agree	21	17.4
	Total	121	100.0



AI enhances teaching & learning efficiency (Figure--9)

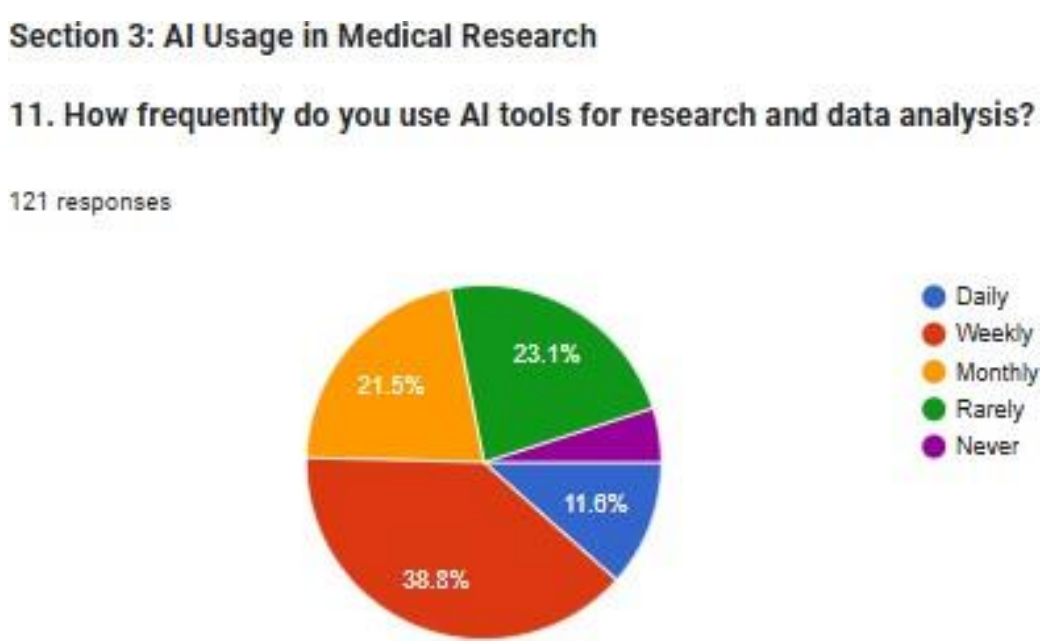
As for how the effect of AI on teaching and learning efficiency is perceived, **48.8% (59 participants)** were neutral, **33.1% (40 participants)** concurred and **17.4% (21** participants) strongly concurred that AI improves efficiency. A very minimal number, 0.8% (1 participant), disagreed, implying that the majority hold a favorable perception of AI or are neutral about its effectiveness.

Section 3: AI Usage in Medical Research

11. How frequently do you use AI tools for research and data analysis?

(Table.10)

11. How frequently do you use AI tools for Research and data analysis?		**Frequency**	**Percent**
Valid	Daily	14	11.6
	Monthly	26	21.5
	Never	6	5.0
	Rarely	28	23.1
	Weekly	47	38.8
	Total	121	100.0

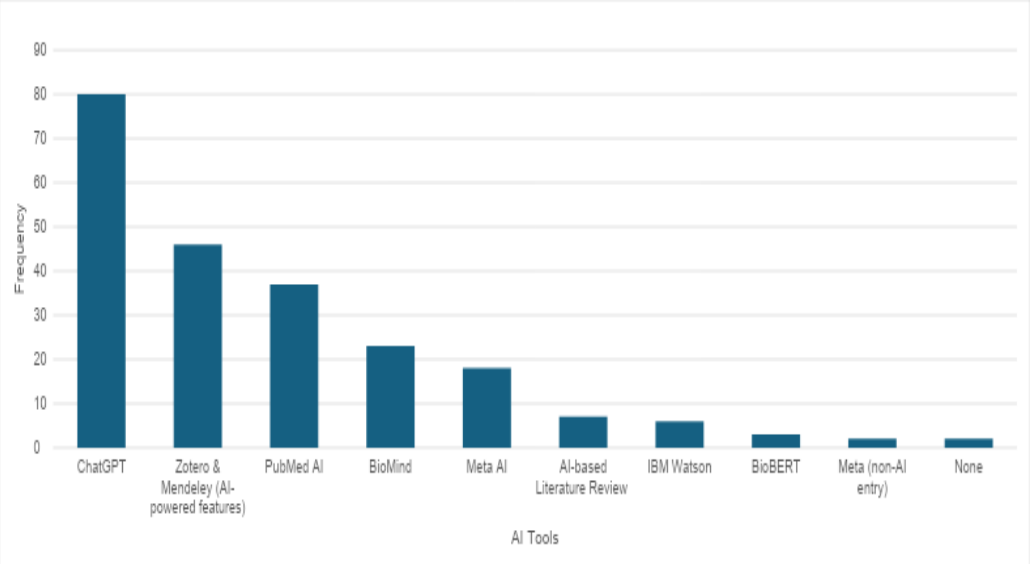


AI tools for research and data analysis (Figure--10)

With regard to AI application for research and data analysis purposes, **38.8% (47 people)** apply AI tools on a weekly basis, which is the most frequent. Further**, 23.1% (28 people)** apply them from time to time, **21.5% (26 people)** apply them monthly, **and 11.6% (14 people)** apply them every day, whereas 5.0% (6 people) indicated that they never apply AI tools in research.

12. Which AI research tools do you use? (Select all that apply) (Table.11)

AI Research Tool	Frequency	Percent (%)
ChatGPT	80	66.1
Zotero & Mendeley (AI-powered features)	46	38.0
PubMed AI	37	30.6
Bio Mind	23	19.0
Meta AI	18	14.9
AI-based Literature Review (Semantic Scholar, Research Rabbit)	7	5.8
IBM Watson	6	5.0
Bio BERT	3	2.5
Meta (non-AI entry)	2	1.7
None	2	1.7

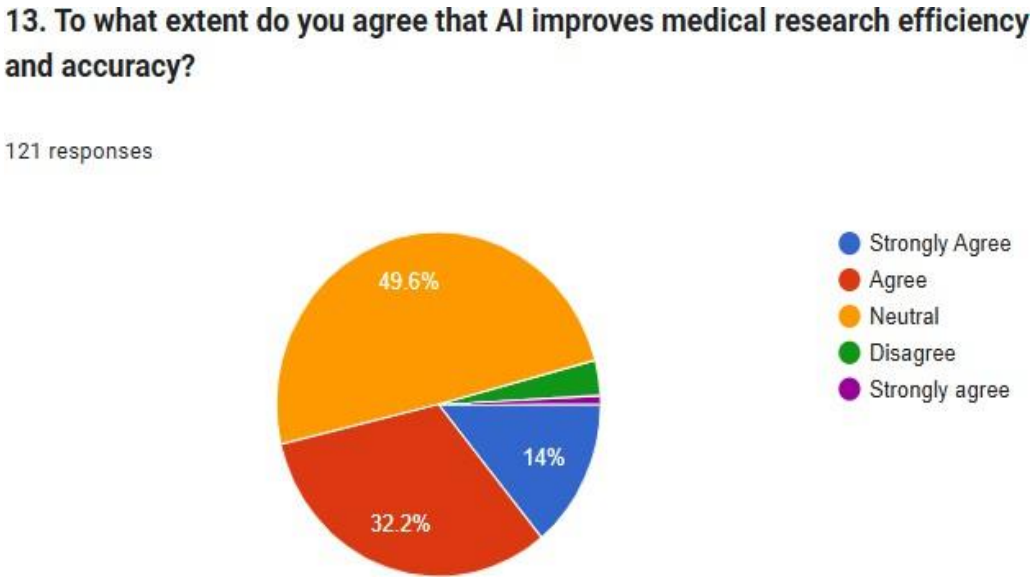


AI research tools do you use (Figure--11)

AI research tools utilized, ChatGPT is the most widely used **with 66.1% (80)** using it to carry out research and data analysis. Zotero & Mendeley **(38.0%),** PubMed AI **(30.6%),** and bio Mind (19.0%) are also utilized, while specialized tools like IBM Watson **(5.0%)** and bio BERT (2.5%) are not as widely taken up by respondents.

AI improves medical research (Table.12)

13. To what extent do you agree that AI improves medical research efficiency and accuracy?		Frequency	Percent
Valid	Agree	39	32.2
	Disagree	4	3.3
	Neutral	60	49.6
	Strongly agree	1	.8
	Strongly Disagree	17	14.0
	Total	121	100.0

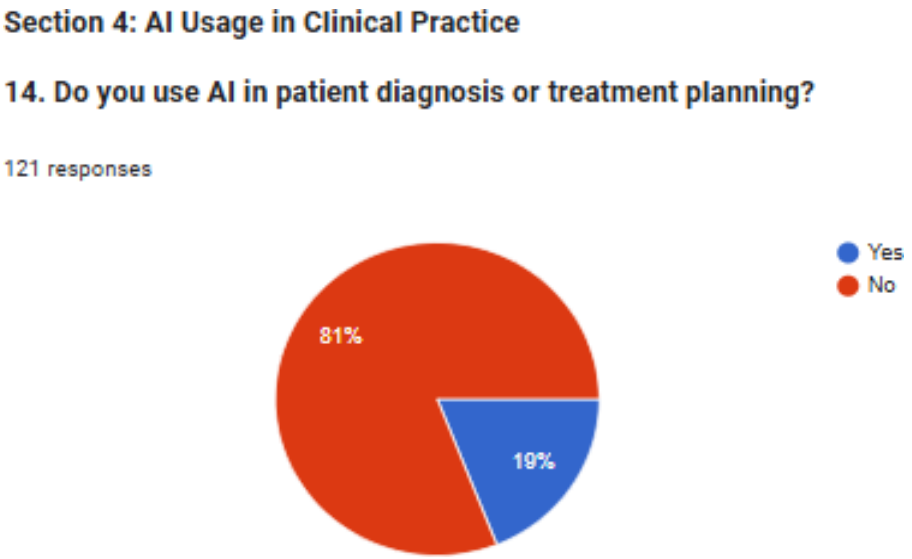


AI improves medical research (Figure--12)

When asked about AI's impact on medical research efficiency and accuracy, **49.6% (60 individuals)** remained neutral, while **32.2% (39 individuals)** agreed and **0.8% (1 individual)** strongly agreed that AI improves research outcomes. **Only 3.3% (4 individuals)** disagreed, medical research.

Section 4: AI Usage in Clinical Practice (Table.13)

14. Do you use AI in patient diagnosis or Treatment planning?		Frequency	Percent
Valid	No	98	81.0
	Yes	23	19.0
	Total	121	100.0

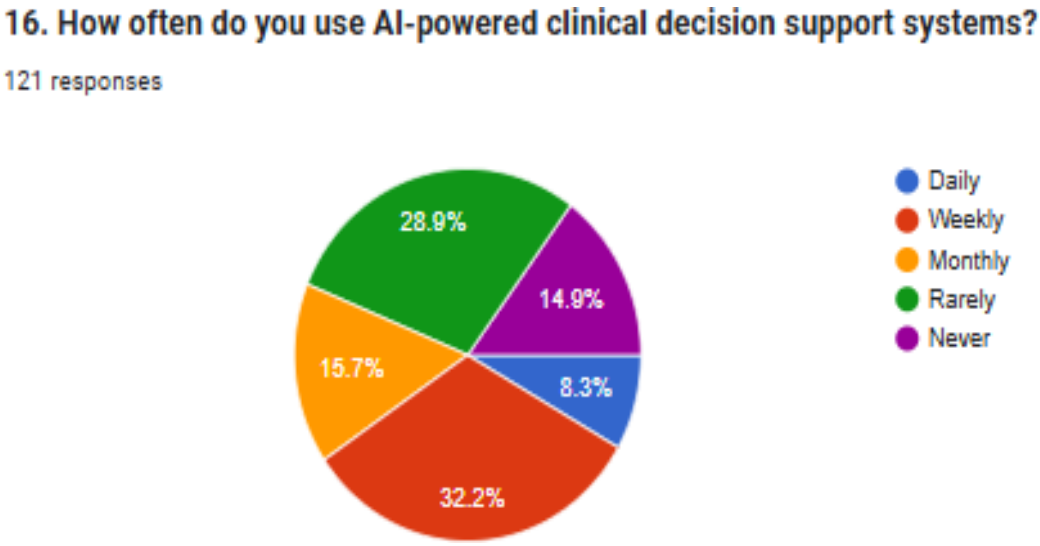


AI in patient diagnosis or treatment planning (Figure--13)

Most of the respondents, **81.0% (98 people),** said that they do not utilize AI for patient diagnosis or treatment planning, reflecting limited use in clinical practice. In contrast, **19.0% (23 people)** attested to the usage of AI tools, reflecting that a limited number is adopting AI for use in clinical decision-making.

AI-powered clinical decision support systems (Table.14)

16. How often do you use AI-powered Clinical decision support systems?		Frequency	Percent
Valid	Daily	10	8.3
	Monthly	19	15.7
	Never	18	14.9
	Rarely	35	28.9
	Weekly	39	32.2
	Total	121	100.0



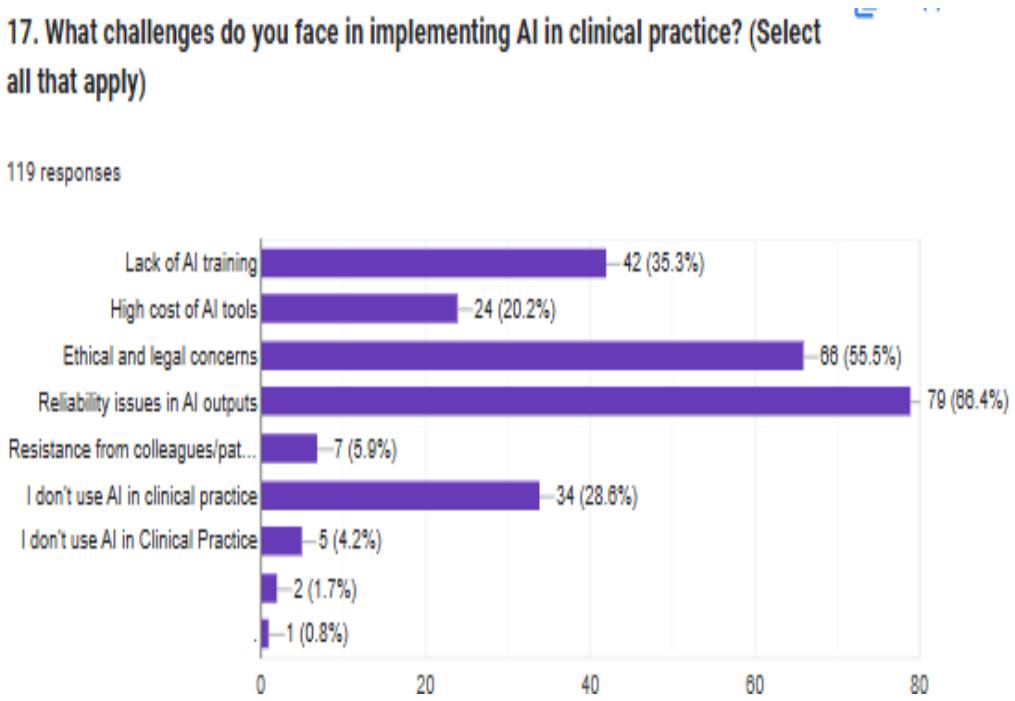
AI-powered clinical decision support systems (Figure--14)

The use of AI-based clinical decision support systems also varies with **28.9% (35)** using them sparingly and **15.7% (19)** using them monthly. However, only **8.3% (10)** use such systems on a daily basis, while **14.9% (18)** said they never used them, suggesting limited, but increasing use in the clinical environment.

17. What challenges do you face in implementing AI in clinical practice? (Select all that apply)

AI in clinical practice (Table.15)

Challenge	Frequency	Percent (%)
Reliability issues in AI outputs	68	56.2
Ethical and legal concerns	55	45.5
Lack of AI training	40	33.1
I don't use AI in clinical practice	39	32.2
High cost of AI tools	20	16.5
Resistance from colleagues/patients	8	6.6

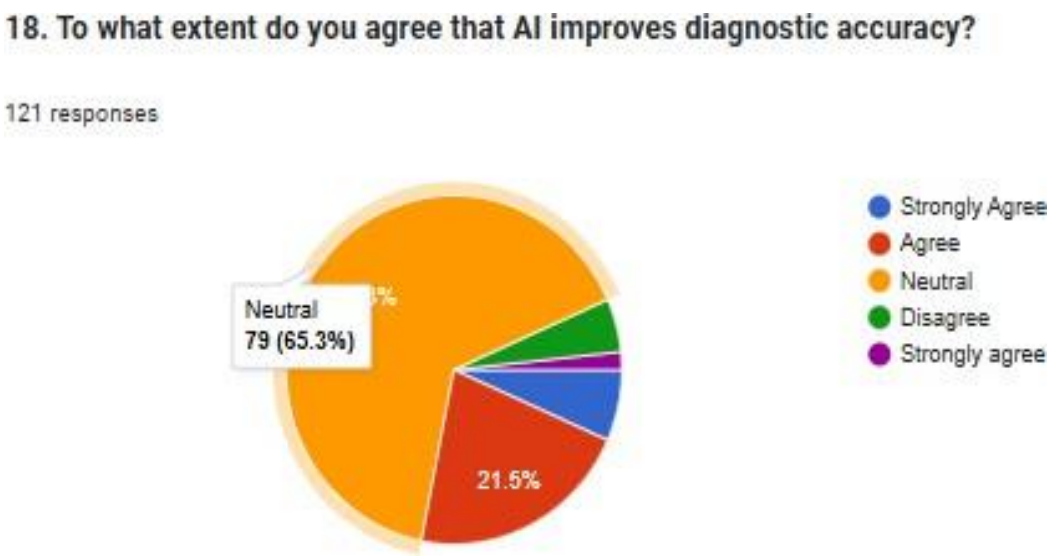


Implementing AI in clinical practice (Figure--15)

Problems, cited by **56.2% (68 respondents),** and then ethical and legal problems at **45.5% (55 respondents).** Lack of training in **AI (33.1%),** non-adoption of **AI (32.2%),** unaffordability of AI tools **(16.5%),** and opposition by colleagues or patients **(6.6%)** are other challenges, both technical and practical in nature.

AI improves diagnostic accuracy (Table.16)

18. To what extent do you agree that AI improves diagnostic Accuracy?		Frequency	Percent
Valid	Agree	26	21.5
	Disagree	6	5.0
	Neutral	79	65.3
	Strongly agree	2	1.7
	Strongly Disagree	8	6.6
	Total	121	100.0

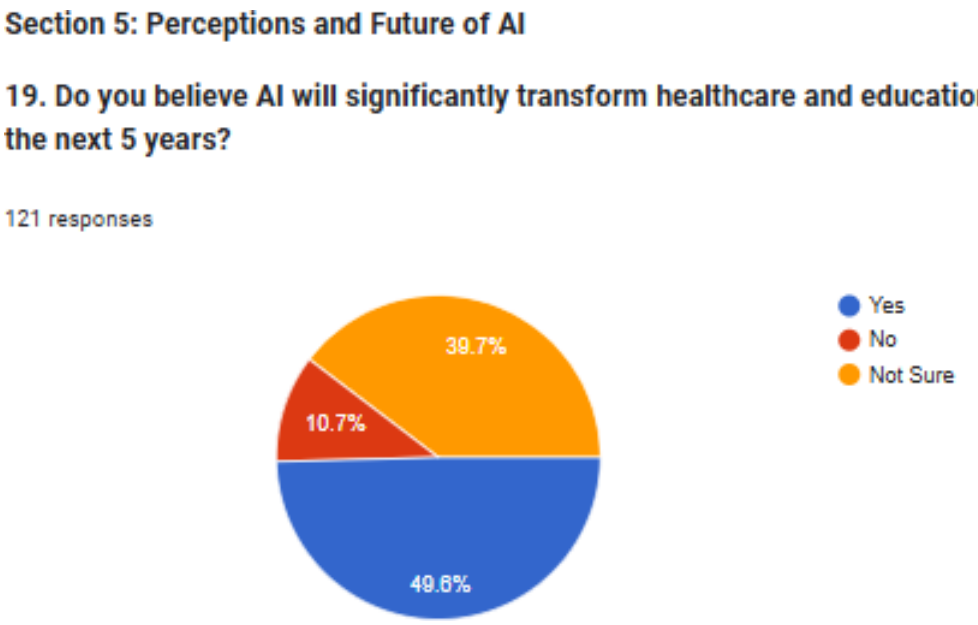


AI improves diagnostic accuracy (Figure--16)

Regarding AI's impact on diagnostic accuracy, the majority of respondents, **65.3% (79 individuals),** remained neutral, while **21.5% (26 individuals)** agreed that AI improves accuracy. Smaller groups disagreed **(5.0%),** strongly disagreed **(6.6%),** or strongly agreed **(1.7%),** indicating uncertainty or mixed opinions about AI's effectiveness in clinical diagnosis

Perceptions and Future of AI (Table.17)

19. Do you believe AI will significantly transform Healthcare and education in the next 5 years?		Frequency	Percent
Valid	No	13	10.7
	Not Sure	48	39.7
	Yes	60	49.6
	Total	121	100.0

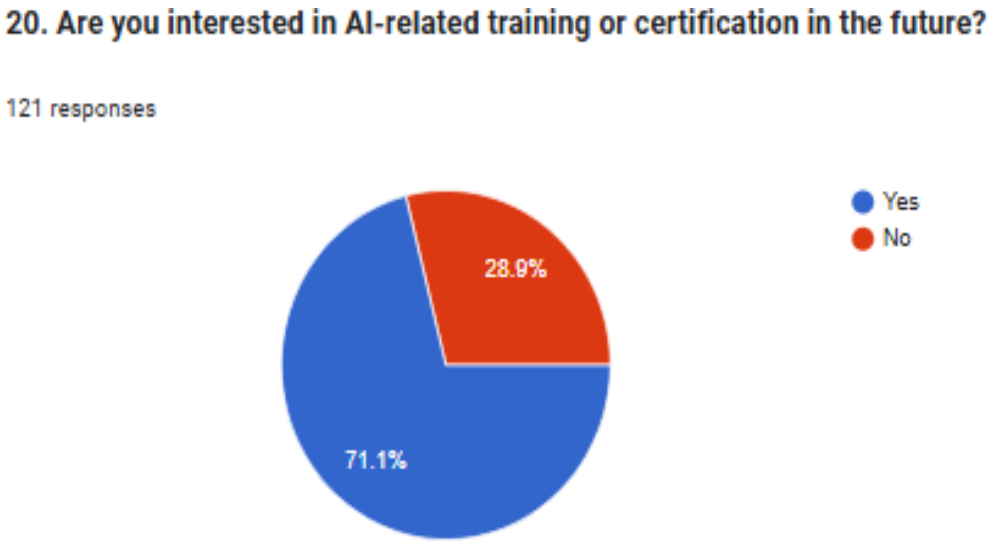


Perceptions and Future of AI (Figure--17)

As far as the future effect of AI is concerned, **49.6% (60 respondents)** think that AI will fundamentally change healthcare and education in the near future in the next five years. However, **39.7% (48 respondents)** do not know, and **10.7% (13 respondents)** don't envision tremendous changes, which shows cautious optimism among respondents

AI-related training or certification in BLDE DU (Table.18)

20.AI-related training or certification in BLDE Deemed to be university		Frequency	Percent
Valid	No	35	28.9
	Yes	86	71.1
	Total	121	100.0

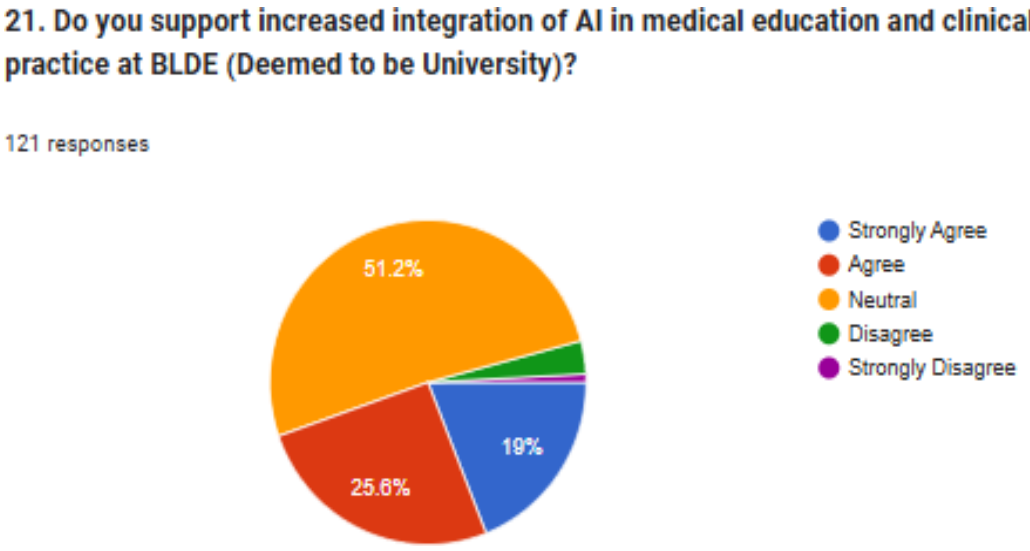


AI-related training or certification in BLDE DU (Figure--18)

71.1% (86 people) of the respondents said they were interested in taking AI-related training or certification in the future, which shows a high willingness to improve their AI skillset**. 28.9% (35 people)** are not interested, which shows some fluctuation in motivation or perceived applicability.

AI in medical education and clinical practice at BLDE DU (Table.19)

21. Do you support increased integration of AI in medical education and clinical practice at BLDE (Deemed to be University)?		Frequency	Percent
Valid	Agree	31	25.6
	Disagree	4	3.3
	Neutral	62	51.2
	Strongly Agree	23	19.0
	Strongly Disagree	1	0.8
	Total	121	100.0



AI in medical education and clinical practice at BLDE DU (Figure--19)

In terms of support for more AI integration at BLDE (Deemed to be University), **51.2% (62 persons)** were neutral, **25.6% (31 persons)** agreed, and **19.0% (23 persons)** strongly agreed. Only a tiny minority disagreed **(3.3%) or strongly disagreed (0.8%),** reflecting overall acceptance or guarded optimism towards AI implementation in medical education and clinical practice.

Gender Comparison Results

Here's how you can describe and present the Chi-Square Test of Independence for the association between Gender and AI training/workshops:

Gender: * Section 1: AI training/workshops?

6. Have you undergone any AI training/workshops?

AI training/workshops (Table.20)

Gender	AI Training – No	AI Training – Yes	Total
Female	31 (72.1%)	12 (27.9%)	43
Male	46 (59.0%)	32 (41.0%)	78
Total	77 (63.6%)	44 (36.4%)	121

Chi-Square Tests

	Value	df	p
Pearson Chi-Square	2.062[a]	1	.151
If p value < 0.05, there is association			

As the p-value (0.151) > 0.05, there is no statistically significant relationship between gender and having received AI training/workshops. This implies that males and females in the sample are just as likely to have gone through AI training programs

Gender: * Section 2: AI Usage in Teaching & Learning

8. How often do you use AI tools in teaching and learning?

AI tools in teaching and learning (Table.21)

Gender	Daily	Monthly	Never	Rarely	Weekly	Total
Female	6 (14.0%)	4 (9.3%)	2 (4.7%)	10 (23.3%)	21 (48.8%)	43
Male	19 (24.4%)	9 (11.5%)	2 (2.6%)	17 (21.8%)	31 (39.7%)	78
Total	25 (20.7%)	13 (10.7%)	4 (3.3%)	27 (22.3%)	52 (43.0%)	121

Chi-Square Test Results

Test	Value	df	p-value
Pearson Chi-Square	2.507	4	0.643

Because the p-value (0.643) > 0.05, gender and frequency of AI tool usage in teaching and learning are not statistically significantly associated. This means that males and females use AI tools with the same frequency in this research.

Gender: * Section 2: AI enhances teaching and learning efficiency?

10. To what extent do you agree that AI enhances teaching and learning efficiency? Gender

AI enhances teaching and learning efficiency (Table.22)

Gender	Agree	Disagree	Neutral	Strongly Agree	Total
Female	15 (34.9%)	1 (2.3%)	19 (44.2%)	8 (18.6%)	43
Male	25 (32.1%)	0 (0.0%)	40 (51.3%)	13 (16.7%)	78
Total	40 (33.1%)	1 (0.8%)	59 (48.8%)	21 (17.4%)	121

Chi-Square Test Results

Test	Value	df	p-value
Pearson Chi-Square	2.227	3	0.527

Because the p-value (0.527) > 0.05, there is no statistically significant relationship between gender and respondents' agreement on whether AI increases teaching and learning efficiency. This suggests that male and female participants have the same perception on the effectiveness of AI in teaching and learning

Gender: * Section 3: AI Usage in Medical Research

11. How frequently do you use AI tools for research and data analysis? Cross-Tabulation of Gender and Frequency of AI Tool Usage in Research

AI Tool Usage in Research (Table.23)

Gender	Daily	Monthly	Never	Rarely	Weekly	Total
Female	6 (14.0%)	11 (25.6%)	0 (0.0%)	10 (23.3%)	16 (37.2%)	43
Male	8 (10.3%)	15 (19.2%)	6 (7.7%)	18 (23.1%)	31 (39.7%)	78
Total	14 (11.6%)	26 (21.5%)	6 (5.0%)	28 (23.1%)	47 (38.8%)	121

Chi-Square Test Results

Test	Value	df	p-value
Pearson Chi-Square	4.202	4	0.379

Because the p-value (0.379) > 0.05, there is no statistically significant relationship between gender and the rate of using AI tools for research and data analysis. This means that male and female respondents use AI in research with comparable rates

2. Gender: * 13. To what extent do you agree that AI improves medical research efficiency and accuracy? Cross-Tabulation of Gender and Agreement on AI Improving Research Efficiency

AI improves medical research (Table.24)

Gender	Agree	Disagree	Neutral	Strongly agree	Strongly Agree	Total
Female	16 (37.2%)	2 (4.7%)	21 (48.8%)	0 (0.0%)	4 (9.3%)	43
Male	23 (29.5%)	2 (2.6%)	39 (50.0%)	1 (1.3%)	13 (16.7%)	78
Total	39 (32.2%)	4 (3.3%)	60 (49.6%)	1 (0.8%)	17 (14.0%)	121

Chi-Square Test Results

Test	Value	df	p-value
Pearson Chi-Square	2.507	4	0.643

As the p-value (0.643) > 0.05, there is no statistically significant relationship between gender and respondents' concurrence on whether AI enhances medical research efficacy and precision. This indicates that both male and female respondents hold the same perception on the contribution of AI in research.

Section 4: AI Usage in Clinical Practice

14. Do you use AI in patient diagnosis or treatment planning?

Cross-Tabulation of Gender and Use of AI in Clinical Practice

(Table.25)

Gender	No	Yes	Total
Female	38 (88.4%)	5 (11.6%)	43
Male	60 (76.9%)	18(24.1)	78
Total	98 (81.0%)	23 (19.0%)	121

Chi-Square Test Results

Test	Value	df	p-value
Pearson Chi-Square	2.360	1	0.124

Because p-value (0.124) > 0.05, gender and use of AI in patient diagnosis or treatment planning are not statistically significantly related. This suggests that male and female respondents are equally likely to use AI in practice.

Gender: * Section 5: Perceptions and Future of AI

19. Do you believe AI will significantly transform healthcare and education in the next 5 years?

Perceptions and Future of AI (Table.26)

Gender	**Do you believe AI will significantly transform Healthcare and education in the next 5 years?**			
	No	**Not sure**	**Yes**	**Total**
M	4	17	22	43
F	9	31	38	78
P=0.922				

Since p-value (0.922) > 0.05, there is no statistical significance between gender and a belief that AI will drastically change healthcare and education in the coming five years. It means male and female respondents have the same perceptions about the future contribution of AI.

2. Gender: * 20. Are you interested in AI-related training or certification in the future? Cross-Tabulation of Gender and Interest in AI Training/Certification

AI-related training or certification in the future

(Table.27)

Gender	**No**	**Yes**	**Total**
Female	18 (41.9%)	25 (58.1%)	43
Male	17 (21.8%)	61 (78.2%)	78
Total	35 (28.9%)	86 (71.1%)	121

Chi-Square Test Result

Test	**Value**	**df**	**p-value**
Pearson Chi-Square	5.429	1	0.020

Because p-value (0.020) < 0.05, there is statistically significant correlation between gender and interest in AI Training or Certification. It implies that male respondents (78.2%) are likely to be more interested than female respondents (58.1%) in seeking AI training or certification in the future. Here p value< 0.05. Therefore, there is correlation between gender and interest in AI Training Programs.

Age Group Compression

Crosstabs

Section 1: Demographic Information

8. How often do you use AI tools in teaching and learning? Cross-Tabulation of Age and Frequency of AI Tool Usage in Teaching & Learning

AI Tool Usage in Teaching & Learning (Table.28)

Age Group	Daily	Monthly	Never	Rarely	Weekly	Total
18–24	20 (30.8%)	6 (9.2%)	3 (4.6%)	13 (20.0%)	23 (35.4%)	65
25–34	4 (20.0%)	4 (20.0%)	1 (5.0%)	5 (25.0%)	6 (30.0%)	20
35–44	0 (0.0%)	3 (11.5%)	0 (0.0%)	4 (15.4%)	19 (73.1%)	26
45+	1 (10.0%)	0 (0.0%)	0 (0.0%)	5 (50.0%)	4 (40.0%)	10
Total	25 (20.7%)	13 (10.7%)	4 (3.3%)	27 (22.3%)	52 (43.0%)	121

Chi-Square Test Results

Test	Value	df	p-value
Pearson Chi-Square	25.037	12	0.015

Because the p-value (0.015) < 0.05, respondents' age has a statistically significant relationship with frequency of AI tool usage in teaching and learning. This means that respondents' age has an impact on the frequency of use of AI tools, as older age

Categories (35–44 and 45+) report greater usage weekly, while the younger ones (18–24) use AI tools more flexibly in daily, rarely, and weekly categories

Section 1: Demographic Information

1. Age (in years) * 10. To what extent do you agree that AI enhances teaching & learning efficiency? Cross-Tabulation of Age and Agreement on AI Enhancing Teaching & Learning Efficiency

AI Enhancing Teaching & Learning Efficiency (Table.29)

Age Group	Agree	Disagree	Neutral	Strongly Agree	Total
18–24	23 (35.4%)	1 (1.5%)	28 (43.1%)	13 (20.0%)	65
25–34	5 (25.0%)	0 (0.0%)	10 (50.0%)	5 (25.0%)	20
35–44	9 (34.6%)	0 (0.0%)	16 (61.5%)	1 (3.8%)	26
45+	3 (30.0%)	0 (0.0%)	5 (50.0%)	2 (20.0%)	10
Total	40 (33.1%)	1 (0.8%)	59 (48.8%)	21 (17.4%)	121

Chi-Square Test Results

	Value	df	p-value
	6.429	9	0.696

Because the p-value (0.696) > 0.05, there is no statistically significant relationship between age and respondents' agreement that AI improves teaching and learning efficiency. This shows that views regarding the efficacy of AI in teaching and learning are uniform in all age groups

Section 1: Demographic Information

1. Age (in years) * Section 3: AI Usage in Medical Research

11. How frequently do you use AI tools for research and data analysis? Cross-Tabulation of Age and Frequency of AI Tool Usage in Research

AI Tool Usage in Research (Table.30)

Age Group	Daily	Monthly	Never	Rarely	Weekly	Total
18–24	11 (16.9%)	15 (23.1%)	3 (4.6%)	15 (23.1%)	21 (32.3%)	65
25–34	2 (10.0%)	5 (25.0%)	2 (10.0%)	4 (20.0%)	7 (35.0%)	20
35–44	1 (3.8%)	4 (15.4%)	0 (0.0%)	4 (15.4%)	17 (65.4%)	26
45+	0 (0.0%)	2 (20.0%)	1 (10.0%)	5 (50.0%)	2 (20.0%)	10
Total	14 (11.6%)	26 (21.5%)	6 (5.0%)	28 (23.1%)	47 (38.8%)	121

Chi-Square Test Results

Test	Value	df	p-value
Pearson Chi-Square	17.944	12	0.117

Because the p-value (0.117) is > 0.05, there is no statistically significant relationship between age and frequency of AI tool use for research and data analysis. This indicates that respondents within any two given age groups use AI for research at equal frequencies without strong differences by age.

Section 1: Demographic Information

1. Age (in years) *

13. To what extent do you agree that AI improves medical research efficiency and accuracy? Cross-Tabulation of Age and Agreement on AI Improving Research Efficiency

AI Improving Research Efficiency (Table.31)

Age Group	Agree	Disagree	Neutral	Strongly agree	Strongly Agree	Total
18–24	19 (29.2%)	3 (4.6%)	31 (47.7%)	1 (1.5%)	11 (16.9%)	65
25–34	8 (40.0%)	0 (0.0%)	9 (45.0%)	0 (0.0%)	3 (15.0%)	20
35–44	9 (34.6%)	1 (3.8%)	15 (57.7%)	0 (0.0%)	1 (3.8%)	26
45+	3 (30.0%)	0 (0.0%)	5 (50.0%)	0 (0.0%)	2 (20.0%)	10
Total	39 (32.2%)	4 (3.3%)	60 (49.6%)	1 (0.8%)	17 (14.0%)	121

Chi-Square Test Results

Test	Value	df	p-value
Pearson Chi-Square	5.881	12	0.922

Since p-value (0.922) > 0.05, there is no statistical significance between age and the respondents' agreement that AI could improve efficiency or accuracy of medical research, which means that perceptions about AI improving efficiency and accuracy of medical research can be considered the same across all age groups.

Section 1: Demographic Information

1. Age (in years) * Section 4: AI Usage in Clinical Practice

14. Do you use AI in patient diagnosis or treatment planning? Cross-Tabulation of Age and Use of AI in Clinical Practice

Use of AI in Clinical Practice (Table.32)

Age Group	No	Yes	Total
18–24	49 (75.4%)	16 (24.6%)	65
25–34	18 (90.0%)	2 (10.0%)	20
35–44	22 (84.6%)	4 (15.4%)	26
45+	9 (90.0%)	1 (10.0%)	10
Total	98 (81.0%)	23 (19.0%)	121

Chi-Square Test Results

Test	Vale	df	p-value
Pearson Chi Square	3.131	3	0.372

Because the p-value (0.922) > 0.05, the association between age and respondents' agreement with the effect of AI on research efficiency and accuracy is not statistically significant. This means that views regarding the effect of AI on research are consistent across all ages.

Section 1: Demographic Information

1. Age (in years) * 6. Have you undergone any AI training/workshops?

Cross-Tabulation of Age and AI Training/Workshop Participate

AI Training/Workshop Participation (Table.33)

Age Group	No	Yes	Total
18–24	54 (83.1%)	11 (16.9%)	65
25–34	12 (60.0%)	8 (40.0%)	20
35–44	6 (23.1%)	20 (76.9%)	26
45+	5 (50.0%)	5 (50.0%)	10
Total	77 (63.6%)	44 (36.4%)	121

Chi-Square Test Results

Test	Value	df	p-value
Pearson Chi-Square	30.017	3	0.000

Since the p-value (0.000) < 0.05, it means that there is a statistically significant relationship between age and taking AI training/workshops. It means that respondents who are older (35–44 years) tend to have attended AI training more than other age groups, whereas the lowest proportion of participation is observed in the youngest group (18–24)

Section 1: Demographic Information

1. Age (in years)

*** 16. How often do you use AI-powered clinical decision support systems?**

Cross-Tabulation of Age and Frequency of AI Clinical Decision Support System Usage

AI Clinical Decision Support System Usage (Table.34)

Age Group	Daily	Monthly	Never	Rarely	Weekly	Total
18–24	9 (13.8%)	14 (21.5%)	6 (9.2%)	20 (30.8%)	16 (24.6%)	65
25–34	1 (5.0%)	3 (15.0%)	3 (15.0%)	8 (40.0%)	5 (25.0%)	20
35–44	0 (0.0%)	2 (7.7%)	5 (19.2%)	4 (15.4%)	15 (57.7%)	26
45+	0 (0.0%)	0 (0.0%)	4 (40.0%)	3 (30.0%)	3 (30.0%)	10
Total	10 (8.3%)	19 (15.7%)	18 (14.9%)	35 (28.9%)	39 (32.2%)	121

Chi-Square Test Results

Test	Value	df	p-value
Pearson Chi-Square	25.015	12	0.015

Since the p-value (0.015) is less than 0.05, it is statistically significant that age is associated with frequency of using AI-powered clinical decision support systems. It indicates that older users (35–44 and 45+) use these systems more weekly or seldom, while younger users (18–24) have more frequent usage in daily, monthly, and seldom categories.

Section 1: Demographic Information

1. Age (in years)

*** 18. To what extent do you agree that AI improves diagnostic accuracy? Cross-Tabulation of Age and Agreement on AI Improving Diagnostic Accuracy**

AI Improving Diagnostic Accuracy (Table.35)

Age Group	Agree	Disagree	Neutral	Strongly agree	Strongly Disagree	Total
18–24	18 (27.7%)	2 (3.1%)	36 (55.4%)	2 (3.1%)	7 (10.8%)	65
25–34	1 (5.0%)	3 (15.0%)	15 (75.0%)	0 (0.0%)	1 (5.0%)	20
35–44	5 (19.2%)	1 (3.8%)	20 (76.9%)	0 (0.0%)	0 (0.0%)	26
45+	2 (20.0%)	0 (0.0%)	8 (80.0%)	0 (0.0%)	0 (0.0%)	10
Total	26 (21.5%)	6 (5.0%)	79 (65.3%)	2 (1.7%)	8 (6.6%)	121

Chi-Square Test Results

Test	Value	df	p-value
Pearson Chi-Square	16.876	12	0.154

Since the p-value (0.154) > 0.05, the association between age and agreement that AI enhances diagnostic accuracy is not statistically significant. This means that opinions regarding the effect of AI on diagnostic accuracy are relatively uniform across age groups

Section 1: Demographic Information

1. Age (in years) * Section 5: Perceptions and Future of AI

19. Do you believe AI will significantly transform healthcare and education in the next 5 years? Tabulation of Age and Belief that AI Will Transform Healthcare and Education

Perceptions and Future of AI (Table.36)

Age Group	No	Not Sure	Yes	Total
18–24	10 (15.4%)	24 (36.9%)	31 (47.7%)	65
25–34	1 (5.0%)	6 (30.0%)	13 (65.0%)	20
35–44	2 (7.7%)	14 (53.8%)	10 (38.5%)	26
45+	0 (0.0%)	4 (40.0%)	6 (60.0%)	10
Total	13 (10.7%)	48 (39.7%)	60 (49.6%)	121

Chi-Square Test Results

Test	Value	df	p-value
Pearson Chi-Square	7.002	6	0.321

Given that the p-value (0.321) > 0.05, there is no statistically significant correlation between the age and the belief that AI will enormously change healthcare and education within the next five years. This means that perceptions regarding the transformative power of AI by participants are the same across all ages.

Section 1: Demographic Information

1. Age (in years)

*** 20. Are you interested in AI-related training or certification in the future?**

Cross-Tabulation of Age and Interest in AI Training/Certification

(Table.37)

Age Group	No	Yes	Total
18–24	30 (46.2%)	35 (53.8%)	65
25–34	2 (10.0%)	18 (90.0%)	20
35–44	3 (11.5%)	23 (88.5%)	26
45+	0 (0.0%)	10 (100.0%)	10
Total	35 (28.9%)	86 (71.1%)	121

Chi-Square Test Results

Test	Value	df	p-value
Pearson Chi-Square	20.762	3	0.000

Because the p-value (0.000) < 0.05, there exists a statistically significant correlation between age and interest in AI training or certification in the future. This means that the older participants (25–44 and 45+) tend to be more interested in AI training, while a larger percentage of younger participants (18–24) are relatively less interested.

Section 1: Demographic Information

1. Age (in years) * 21. Do you support increased integration of AI in medical education and clinical practice at BLDE (Deemed to be University)?

Cross-Tabulation of Age and Support for AI Integration

(Table.38)

Age Group	Agree	Disagree	Neutral	Strongly Agree	Strongly Disagree	Total
18–24	17 (26.2%)	4 (6.2%)	30 (46.2%)	13 (20.0%)	1 (1.5%)	65
25–34	7 (35.0%)	0 (0.0%)	10 (50.0%)	3 (15.0%)	0 (0.0%)	20
35–44	5 (19.2%)	0 (0.0%)	17 (65.4%)	4 (15.4%)	0 (0.0%)	26
45+	2 (20.0%)	0 (0.0%)	5 (50.0%)	3 (30.0%)	0 (0.0%)	10
Total	31 (25.6%)	4 (3.3%)	62 (51.2%)	23 (19.0%)	1 (0.8%)	121

Chi-Square Test Results

Test	Value	df	p-value
Pearson Chi-Square	7.910	12	0.792

Because the p-value (0.792) > 0.05, there is no statistically significant relationship between age and support for greater AI integration. This indicates that participants of all ages have a similar degree of support for integrating AI in medical school and clinical practice at BLDE DU

5. 2 Ethical considerations

Ethical aspects were an integral part of this research to preserve participants' rights and ethically responsible implementation of AI technologies in healthcare and education environments.

Informed Consent and Voluntary Participation: All participants were given thorough information regarding the goals, methods, and consequences of the study.

Informed consent was received from all participants with a proper explanation that the participation was voluntary and they could withdraw at any point.

Anonymity and Confidentiality: All information gathered was handled with utmost confidentiality. Personal details were erased to preserve participant anonymity. Information was safely archived, and access was restricted to the research staff.

Data Security and Integrity: Electronic data were saved in password-encrypted systems, while physical documents were stored in locked cabinets. Authorized personnel only gained access to the data. All procedures met institutional data protection guidelines.

Risk Minimization: The study aimed at minimizing the psychological, social, or professional risk to participants. The survey and interview questions were formulated in a neutral, non-invasive way.

Ethical Application of AI Information and Tools: As the research focuses on views and usage of AI, special emphasis was put on ethical issues related to algorithmic bias, transparency, accountability, and fairness. These aspects were raised with the participants to make them aware of the issues and understand their concerns and perspectives.

Interest in Future AI Training

A resounding 71.1% (86 participants) were interested in future AI-associated certification or training, indicating a clear call for capacity-building initiatives.

Perception on AI Integration at BLDE University

- Support for Increased AI Integration:
    - 70.2% either agreed or strongly agreed on integrating AI within medical education and clinical practice.
- Belief in AI's Future Impact:
    - 39.7% of them opined that AI would change healthcare and education dramatically in the next 5 years; 49.6% did not know, underlining a demand for education and advice

CHAPTER: 6

FINDINGS AND SUGGESTION

Interpretation of results with respect to Study

The results of this study were explained in the context of the major objectives laid out at the start of the research, intending to comprehend the complex role of Artificial Intelligence (AI) in teaching, learning, research, and practice at BLDE (Deemed to be University).

To assess the current use of AI in teaching and learning To determine the extent of using AI for teaching and learning, the data showed that most faculty staff and students have started utilizing AI tools like ChatGPT, Google Bard, and other AI-supported platforms for content development, lesson planning, tests, and one-on-one tutoring. The tools have improved teaching effectiveness and classroom interaction, and even made learning more interactive and available to students.

To evaluate perceptions regarding AI's effectiveness in education and research Researchers viewed AI as a helpful aid in streamlining administrative tasks, increasing academic productivity, and facilitating evidence-based decision-making. They also noted that AI has enhanced research quality and innovation by utilizing tools for literature review, data analysis, and predictive modeling. Concerns on overdependence, academic integrity, and ethical application were registered, prompting the necessity of AI literacy and guidelines on appropriate use within the academic community.

To recommend strategies for effective AI integration In order to provide recommendations on effective AI integration Participants suggested institutional training programs, creation of holistic AI policies, technological infrastructure investments, and encouragement of collaborative research as major strategies to promote responsible AI adoption. They stressed capacity-building initiatives and inclusive technology policies to have effective and ethical AI integration in education and research.

In short, the findings suggest increasing accommodation and utilization of AI in teaching, research, and clinical practice at BLDE. But effective integration means taking a balanced approach to deal with ethical, technical, and pedagogical issues

Demographic Information

121 respondents took part in the study, giving a representative sample of the participants by age, gender, academic position, department, and work experience. The

analysis of the age ranges showed that most of the participants were aged 45 and above (53.7%), followed by 25–34 years (21.5%) and 35–44 years (16.5%). The least number of respondents was aged 18–24 at 8.3%. This distribution implies a high presence of senior faculty members or veteran professionals in the sample, and this can bias the AI adoption and perception due to potentially cautious adoption by older professionals as opposed to younger respondents.

On the basis of gender, the male participants made up 64.5%, and females 34.7%, with a mere 0.8% calling themselves other. This predominance of males is in accordance with past patterns in medical schools and underscores the need to provide equal access and training for both genders in AI implementation programs.

Based on academic category, the study participants were UG students (36.4%), PG students (28.1%), research scholars (5%), and faculty members (32.2%). This variance guarantees the survey reached both educators and learners, providing an opportunity for a balanced view about AI integration in the hierarchy of education. The departmental feedback was extensive, representing Human Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology, Forensic Medicine, Community Medicine, and a number of clinical specialties. Departments such as Pediatrics (7 respondents) and E.N.T. (6 respondents) also showed greater participation among clinical departments, mirroring their possible interest in AI use. A few departments such as General Surgery, Ophthalmology, Obstetrics & Gynecology, Radiology, and Psychiatry did not receive any responses, which might reduce generalizability in these specialties.

Years of work experience showed that most (69.9%) had fewer than 5 years of experience, followed by 11–20 years (21.2%). Few had more than 20 years of experience. This points to AI acceptance and familiarity potentially being biased towards younger workers who are more open to technology.

With regards to previous experience with AI, 63.6% had undergone AI training or workshops, whereas 36.4% had not. From the trained group, training types were AI in Healthcare (8.8%), AI in Teaching & Learning (11%), and AI in Research (39.6%), which shows that a vast number of participants were interested in applying AI in research. This baseline indicates the increasing relevance of AI education and awareness among healthcare students and professionals.

AI Usage in Teaching and Learning

Usage of AI in teaching and learning was diverse. 52 (43%) of the respondents used AI rarely, 22.3% used it weekly, 20.7% daily, and 10.7% monthly, indicating that awareness notwithstanding, regular inclusion in daily teaching is low. The large share of rare users may be due to issues such as unfamiliarity, weak institutional support, or lack of well-defined curricula for AI tools.

Among the AI applications used in education, ChatGPT for content generation was the most popular (94.2%), depicting growing use of generative AI for the creation of lecture notes, examinations, and study materials. Other commonly used platforms were MedGPT (47.1%), Deepseek (40.5%), and Gemini (44.6%), demonstrating use of AI for clinical questions, retrieval of information, and content generation. Less commonly used sites such as Lecturio, AMBOSS, Coursera, and edX indicate minimal use of AI-driven educational websites in day-to-day practice.

Concerning the opinions on how effective AI is for teaching, 17.4% and 48.8% said strongly agree and agree respectively that AI facilitates improved efficiency in teaching, with 33.1% being neutral. This reveals that the majority by far sees the potential to enhance pedagogical efficiency through AI, though a considerable percentage of respondents are undecided, likely due to insufficient hands-on experience or vague knowledge of AI's pedagogical value.

AI Usage in Medical Research

Use of AI in research was slightly higher than in teaching, with 23.1% using AI weekly, 21.5% monthly, 11.6% daily, and 38.8% rarely. These findings reveal that AI integration in research remains inconsistent, with many relying on conventional methods.

Generally employed AI research tools were ChatGPT (75.2%), PubMed AI (46.3%), Zotero & Mendeley (43%), and Meta AI (29.8%), indicating the dependency on AI-powered literature search, reference management, and summarization of text. Advanced research tools such as IBM Watson (5%), BioBERT (2.5%), and BioMind (2.5%) were used infrequently, pointing towards limited adoption of sophisticated AI tools for high-level data analytics or drug discovery.

Perceptions about the role of AI in research were optimistic, where 14% showed strong agreement and 49.6% agreed that AI enhances efficiency and accuracy, and 32.2% were neutral. This indicates that although researchers recognize the potential of AI, skepticism still exists, perhaps because of concerns about data reliability, reproducibility, and ethics

AI Usage in Clinical Practice

Clinical uptake of AI was extremely low. Just 19% of participants indicated use of AI in patient diagnosis or treatment planning, with 81% indicating non-use. Some of the AI systems used included AI-based EHR analysis (6 participants), Qure.ai (5), IBM Watson for Oncology (5), and Nuance Dragon Medical one (3), with evidence of low penetration of clinical AI technologies.

Frequency analysis revealed that 32.2% never applied AI in clinical decision-making, 28.9% applied it on a monthly basis, and merely 8.3% applied it on a daily basis. Obstacles identified are lack of training in AI (35.3%), being too expensive (20.2%), ethical/legal issues (55.5%), reliability issues (66.4%), and opposition from colleagues or patients (5.9%), with a considerable part also not using AI at all (28.6%). These results highlight the substantial hurdles to clinical adoption of AI, reinforcing the call for systematic training, affordable solutions, and oversight policies facilitating safe deployment.

Surprisingly, 65.3% concurred that AI enhances diagnostic accuracy, given that respondents understand the advantages of AI even though adoption levels are low..

Perceptions and Future of AI

The participants showed positivity towards the impact of AI in the future, with 39.7% expressing confidence that AI will profoundly change healthcare and education within the next five years, even though 49.6% were unsure. There was great interest in training related to AI among 71.1%, meaning professionals and students want to develop AI expertise.

In terms of integration at BLDE University, 19% of them strongly agreed and 51.2% agreed on greater AI use in medical education and clinical practice, reflecting support and receptivity at the institutional level for technology-driven change. Further comments stressed the necessity of workshops, awareness campaigns, and ethical frameworks, signaling the significance of formal institutional strategies for proper and responsible AI incorporation.

These results indicate that there is awareness of the transformative role of AI in teaching, research, and clinical practice but implementation varies and has considerable hurdles. Strategic plans to support training, awareness generation, ethical guidelines, and affordable AI tools are needed to unlock the full potential of AI in BLDE (Deemed to be University).

CHAPTER: 7

SUMMARY RECOMMENDATIONS AND CONCLUSION

7.1 Summary of Key Findings

The participants showed positivity towards the impact of AI in the future, with 39.7% expressing confidence that AI will profoundly change healthcare and education within the next five years, even though 49.6% were unsure. There was great interest in training related to AI among 71.1%, meaning professionals and students want to develop AI expertise.

In terms of integration at BLDE University, 19% of them strongly agreed and 51.2% agreed on greater AI use in medical education and clinical practice, reflecting support and receptivity at the institutional level for technology-driven change. Further comments stressed the necessity of workshops, awareness campaigns, and ethical frameworks, signaling the significance of formal institutional strategies for proper and responsible AI incorporation.

These results indicate that there is awareness of the transformative role of AI in teaching, research, and clinical practice but implementation varies and has considerable hurdles. Strategic plans to support training, awareness generation, ethical guidelines, and affordable AI tools are needed to unlock the full potential of AI in BLDE (Deemed to be University).

7.2 Recommendations

Sequel to the analysis of the data collected, some recommendations can be given for improving the effective integration and use of Artificial Intelligence (AI) in learning, teaching, research, and clinical practice at BLDE (Deemed to be University).Initially, the research emphasizes the importance of enhancing AI-connected training and capacity development programs. As the majority of the respondents (63.6%) have not received any AI training or workshops, it is important to arrange systematic programs like seminars, hands-on workshops, and certificate courses in order to enhance AI literacy among students and faculty. These programs will enable participants to acquire useful skills and build confidence in using AI tools in academic and clinical settings.

Secondly, institutional infrastructure and support are essential for sustainable AI integration. The university needs to invest in state-of-the-art technological infrastructure, such as licensed AI software, computing facilities, and reliable internet connectivity. The creation of an exclusive AI Resource and Innovation Center would

Facilitate centralized support, technical expertise, and foster research collaboration across departments.

Third, incorporating AI in the academic curriculum is needed. AI principles and applications must be taught in undergraduate and postgraduate studies using case studies, simulation, and project-based education. Through this strategy, students will learn the ethical, analytical, and practical dimensions of AI in healthcare and education.

Additionally, the research shows moderate utilization of AI tools in data analysis and research, and the need for additional encouragement. The institution must encourage AI-based research projects, provide funding or incentives for creative studies, and create collaborations with outside research institutions or industry partners. Not only will this increase research productivity, but it also will facilitate innovation as well as interdisciplinary learning.

The other significant suggestion is to bridge the digital divide that was noticed across respondents belonging to various age groups and professional categories. Special support and mentoring programs should be created for older faculty members and clinicians who might have limited familiarity with AI tools. Peer-to-peer learning and joint workshops can facilitate covering this gap and achieving equal representation from all groups.

In addition, the university must develop clear policies and ethical standards guiding the use of AI. These policies should cover matters of data privacy, academic honesty, and using AI responsibly in research and teaching. Transparency and adherence to ethics will foster trust and stimulate wider adoption of AI technologies.

Lastly, ongoing assessment and feedback mechanisms must be put in place to track AI integration progress. Systematic surveys, feedback meetings, and performance evaluations can provide insights on challenges, measure outcomes, and adapt improvement strategies. Encouraging interdisciplinary learning among departments including Medicine, Biochemistry, Pharmacology, and Community Medicine can further enhance AI-related teaching and research activities across the institution.

7.3 Conclusion

The current research, "***The Role of Artificial Intelligence (AI) in Teaching, Learning, Research, and Clinical Practice: A Study at BLDE (Deemed to be University)",*** offers important insights regarding the existing level of awareness, use,

And attitudes of AI among researchers, students, and instructors. The report points out that although the use of AI tools is gradually on the rise, much more is still needed in terms of training, infrastructural support, and institutional encouragement in order to utilize these technologies efficiently and ethically.

The demographic report showed that most of the responders belonged to the 18–24 age category, which indicates students who are more digitally flexible and willing to use AI in their educational settings. Male respondents dominated the sample, and distribution across different departments and years of experience mirrored a balanced and diverse participation rate. Yet, a substantial number of responders indicated minimal AI training or workshop exposure, pointing to a deficit in formal capacity-building programs.

The research also revealed that the AI tools, including ChatGPT, MedGPT, Gemini, and Deepseek, are popularly used, especially in learning and teaching processes. Users weekly and daily combined made up a significant size, which is evidence that AI has started having its impact on pedagogy. In research work, the use of PubMed AI, Zotero, and Mendeley was prevalent, though infrequently used, indicating possible higher utilization. In clinical practice, there was moderately low adoption of AI, primarily because of reliability concerns, ethical considerations, and lack of training or institutional infrastructure.

Overall, respondents demonstrated a positive outlook toward AI's future in education and healthcare, with many believing that AI will significantly transform these fields in the next five years. Most participants also expressed interest in attending AI-related workshops or certifications and supported the increased integration of AI into medical education and clinical practice at BLDE (Deemed to be University).

In summary, the research highlights the synergistic potential of AI to improve the quality and effectiveness of medical and allied health education, research, and patient care. To meet this potential, however, there is a need for strategic investments in digital infrastructure, the development of faculty, policy making, and ethical regulation. By promoting an ethos of ongoing learning, creativity, and collaboration, BLDE (Deemed to be University) can become a model for responsibly and effectively integrating AI into academic and clinical settings.

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ANNEXURE - I

Questioner

"The Role of AI (Artificial Intelligence) in Medical Teaching, Learning, Research and Clinical Practice: A Study at B.L.D.E. (Deemed to be University) "

I am Mrs. Akshatha Kannal, a final year (4th Sem.) postgraduate student enrolled in the M.L.I.Sc. Program at B.L.D.E. (Deemed to be University). As part of my dissertation, I am conducting a research study on the above-mentioned topic under the guidance of Mr. ShivaKumar Acharya, Lecturer in the Department of Library and Information Science, B.L.D.E. (DU).

The purpose of this study is to examine and analyze the integration, utilization, and impact of Artificial Intelligence in teaching, learning, research, and clinical practice at B.L.D.E. (Deemed to be University). The study aims to identify current practices, benefits, challenges, and future prospects related to AI adoption. Your

Participation in this survey is extremely valuable to my research. It will greatly contribute to a better understanding of the role of Artificial Intelligence in teaching, learning, research, and clinical practice at B.L.D.E. (Deemed to be University).

Instructions:

- Please answer all questions honestly.
- Your responses will remain confidential and used for research purposes only.
- Select the most appropriate response for each question.

* Indicates required question

Email*

Record **akshatakannal@gmail.com** as the email to be included with my response

Section 1: Demographic Information

1. Age (in years)

*

- 18-24
- 25-34
- 35-44
- 45-Above

2. Gender:

*

- Male
- Female

3. Categories

*

- UG Student
- PG Student
- Research Scholar
- Faculty

4. Department*

5. Years of Experience in Teaching/Clinical Practice

- Less than 5 years
- 5-10 years
- 11-20 years
- More than 20 years

6. Have you undergone any AI training/workshops?

*

- Yes
- No

7. If yes, which AI-related training/workshop did you attend?

*

- No
- Yes

Section 2: AI Usage in Teaching & Learning

8. How often do you use AI tools in teaching and learning?

*

- Daily
- Weekly
- Monthly
- Rarely
- Never

9. Which AI tools do you use in teaching and Learning? (Select all that apply)

*

- ChatGPT for content creation
- Lecturio is an online learning platform specializing in medical and education.
- AMBOSS is a comprehensive online learning platform for Medical Education
- Osmosis is medical education tool that provides video lectures, flashcards,
- Coursera and edX are online learning platforms that offer AI-powered medical education courses from top universities, medical schools, and institutions worldwide.
- MedGPT AI chatbots for answering medical queries and explanations.
- Touch Surgery – AI-based surgical simulation for hands-on practice.
- Body Interact – AI-driven virtual patient simulations for clinical decision-making.
- Deepseek
- Gemini
- Grok &Meta
- Other:

10. To what extent do you agree that AI enhances teaching & learning efficiency?

*

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Section 3: AI Usage in Medical Research

11. How frequently do you use AI tools for research and data analysis?

*

- Daily
- Weekly
- Monthly
- Rarely
- Never

12. Which AI research tools do you use? (Select all that apply)

*

- IBM Watson for Data Analysis
- BioBERT for Medical Text Mining
- Zotero & Mendeley (AI-powered features) – AI-driven reference management citation generation
- BioMind—AI for neuroscience and drug discovery research.
- PubMed AI – AI-assisted search and summarization of medical research.
- AI-based Literature Review (Semantic Scholar, Research Rabbit)
- ChatGPT
- Meta AI
- Other:

13. To what extent do you agree that AI improves medical research efficiency and accuracy?

*

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly agree

Section 4: AI Usage in Clinical Practice

14. Do you use AI in patient diagnosis or treatment planning?

*

- Yes
- No

15. If yes, which AI tools do you use? (Select all that apply)

- Qure.ai—AI-based radiology interpretation for medical training.
- Zebra Medical Vision – AI-driven radiology and medical imaging analysis.
- IBM Watson for Oncology – AI-driven clinical decision support system.
- AI-based EHR (Electronic Health Records) Analysis
- Nuance Dragon Medical One – AI-based speech recognition for clinical documentation.
- Suki AI – AI-powered medical voice assistant for electronic health record (EHR) management
- Not Applicable
- Other:

16. How often do you use AI-powered clinical decision support systems?*

- Daily
- Weekly
- Monthly
- Rarely
- Never

17. What challenges do you face in implementing AI in clinical practice? (Select all that apply)

*

- Lack of AI training
- High cost of AI tools
- Ethical and legal concerns
- Reliability issues in AI outputs
- Resistance from colleagues/patients
- I don't use AI in clinical practice
- Other:

18. To what extent do you agree that AI improves diagnostic accuracy?

*

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly agree

Section 5: Perceptions and Future of AI

19. Do you believe AI will significantly transform healthcare and education in the next 5 years?

*

- Yes
- No
- Not Sure

20. Are you interested in AI-related training or certification in the future?

*

- Yes
- No

21. Do you support increased integration of AI in medical education and clinical practice at BLDE (Deemed to be University)?

*

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

22. Any additional comments or suggestions on AI integration in BLDE (Deemed to be University)?

*

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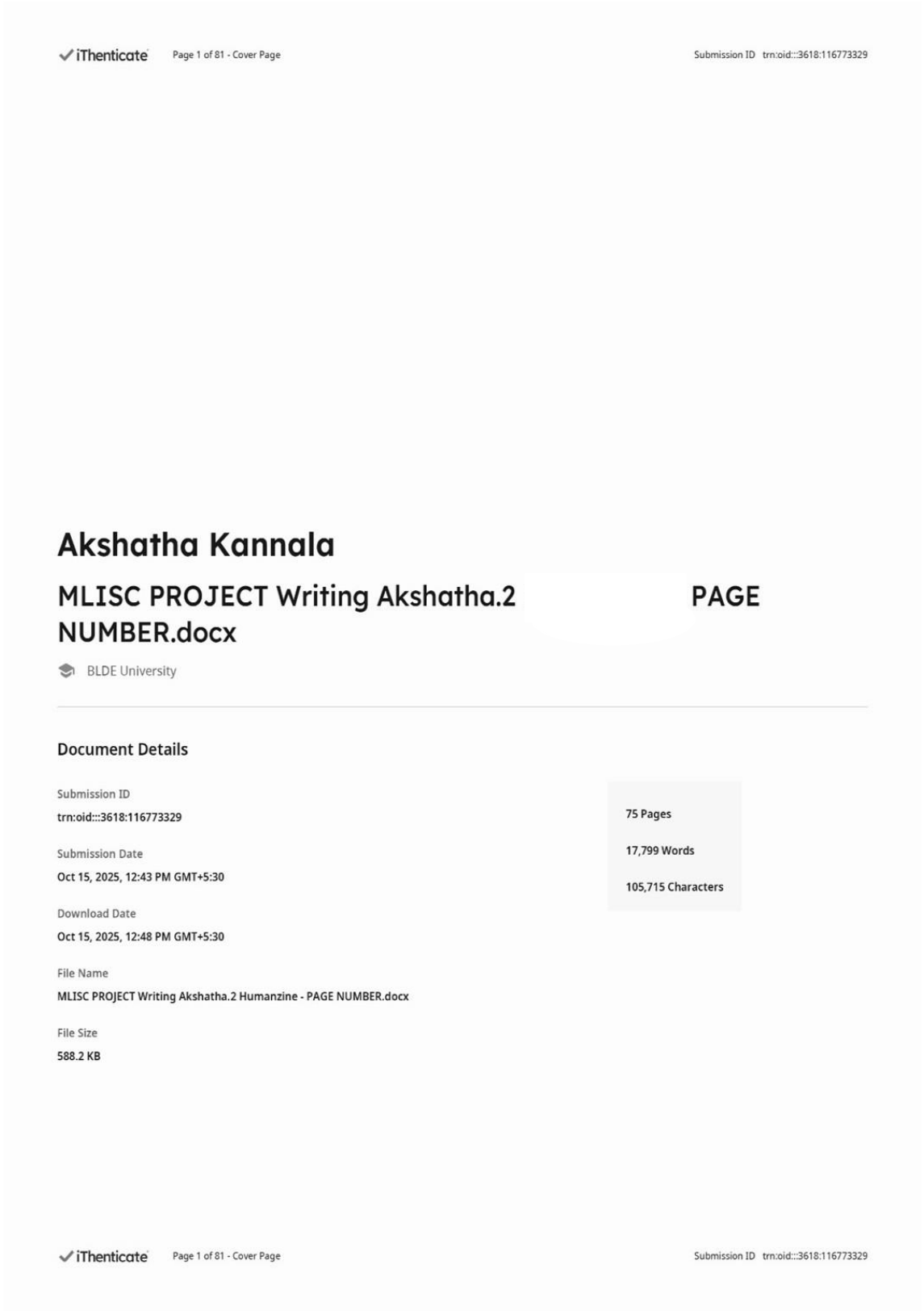

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