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A Study on the Impact of AI Tools on Graduate Employability

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ABSTRACT: Artificial Intelligence (AI) is changing the job market by automating tasks, improving productivity, and reshaping skill requirements. AI-powered tools such as ChatGPT, Grammarly, AI tutors, and automated assessments are widely used in education, helping students learn better and faster. However, it is still unclear whether these tools actually improve students' chances of getting a job. This study explores how AI tools affect graduate employability, focusing on students' awareness, usage, and concerns about AI replacing jobs. A survey of 200 undergraduate and postgraduate students was conducted to understand how they use AI in their studies and how they believe AI will impact their future careers. The results show that while AI improves learning and academic performance, many students feel unprepared for an AI-driven job market. A lack of AI-related training and uncertainty about future job opportunities were common concerns among students. The study highlights that AI skills, adaptability, and continuous learning are essential for future employment. It recommends that universities introduce AI-focused courses, hands-on training, and industry collaborations to help students prepare for an AI-powered workforce.

KEYWORDS: Artificial Intelligence, Graduate Employability, AI in Education, Workforce Development, AI Skills, Digital Learning

I. INTRODUCTION

Artificial Intelligence (AI) is transforming industries by automating repetitive tasks, improving decision-making and enhancing productivity. From manufacturing and healthcare to education and finance, AI is redefining how businesses operate and how employees perform their tasks. In higher education, AI-driven tools such as ChatGPT, Grammarly, automated tutoring systems, and virtual assistants are being widely adopted to enhance learning, personalize education, and prepare students for the evolving job market.

As AI technology advances, the demand for AI-related skills is increasing across industries. The World Economic Forum (2023) predicts that AI could displace 85 million jobs globally by 2025, but at the same time, it will create 97 million new roles requiring specialized skills such as data analysis, machine learning, cyber-security, and AI ethics. This shift means that graduates need to be well-equipped with AI competencies to remain competitive in an AI-integrated workforce.

Despite AI's growing presence, many students lack clarity about its impact on employability. Some fear that AI will replace traditional jobs, while others see it as an opportunity to improve efficiency and enhance creativity (Acemoglu & Restrepo, 2018). However, the widespread availability of AI tools in education does not automatically translate into job readiness. There is still a gap between AI usage in academic settings and its practical application in workplaces. Many students use AI for academic tasks such as writing, grammar correction, and research but do not fully understand how AI is changing career opportunities and industry expectations.

Purpose of the Study

This study investigates the role of AI tools in graduate employability, focusing on three key areas:

1. How students use AI tools for learning and career development.
2. Whether AI tools improve employability or create job insecurity.
3. What universities and industries can do to prepare students for AI-driven careers.

II. OBJECTIVES OF THE STUDY

This study aims to:

1. Assess students' familiarity with AI tools and their frequency of use.
2. Evaluate the impact of AI tools on graduate employability, including skill enhancement.
3. Analyze concerns regarding AI-driven job automation and job security.
4. Identify gaps in AI education and workforce training needs.
5. Provide recommendations for AI skill development in higher education and career training.

III. LITERATURE REVIEW

Artificial Intelligence (AI) is rapidly transforming the global job market by automating tasks, improving efficiency, and reshaping workforce skill requirements. With AI-driven tools becoming increasingly embedded in education and workplaces, there is a growing need to understand how AI impacts employability, job security, and skill development. This section reviews existing research on AI's influence on employment, education, and workforce training.

3.1 AI and Job Market Transformation
The rise of AI has sparked debates about job displacement vs. job creation. While some experts argue that AI eliminates routine-based jobs, others believe it enhances productivity and creates new career opportunities.

- Job Displacement: Frey and Osborne (2017) estimate that 47% of jobs in the U.S. could be at risk of automation, particularly in customer service, manufacturing, and administrative roles. Many repetitive, low-skill jobs are being replaced by AI-driven systems, leading to concerns about job security and income inequality.
- Job Creation & Transformation: In contrast, Manyika et al. (2017) argue that AI will create more jobs than it displaces. New roles in AI development, cyber-security, data analytics, and human-AI collaboration are emerging, requiring graduates to develop new skill sets to remain competitive.
- Skill Adaptation: Bessen (2019) emphasizes that industries integrating AI require workers to adapt to AI-enhanced roles rather than compete against automation. Companies are shifting toward hiring employees who can work alongside AI systems, increasing demand for AI literacy, critical thinking, and problem-solving skills.

3.2 AI in Higher Education
AI has significantly influenced education by enhancing personalized learning, automating administrative tasks, and improving skill development.

- **AI-Powered Learning Tools**: AI tools such as adaptive learning systems, automated grading software, and virtual tutors allow for customized learning experiences. Luckin et al. (2016) highlight how AI-driven platforms analyze student performance data to tailor learning materials, making education more efficient.
- **Skill Development & Career Readiness**: Holmes et al. (2019) argue that AI-powered learning tools help students develop critical thinking, analytical, and digital skills that are highly valued in modern workplaces. However, despite these advancements, many students lack formal AI training to apply these skills in real-world job scenarios
- **AI Training Gaps**: The OECD (2023) reports that while universities integrate AI tools into education, most institutions lack structured AI training programs that prepare students for AI-related careers. This gap limits students' ability to transition seamlessly into AI-driven industries.

3.3 The Growing Demand for AI Skills
As AI continues to evolve, employers increasingly seek AI-literate professionals who can leverage AI tools effectively.
- **Industry Demand:** The McKinsey Global Institute (2023) highlights that industries such as finance, healthcare, business, and engineering now prioritize skills in AI-driven decision-making, automation, and data analytics.
- **Workforce Re-skilling:** The World Economic Forum (2023) predicts that by 2025, 50% of employees will need re-skilling due to AI advancements. This underscores the need for AI integration into university curriculums and corporate training programs.
- **Bridging the Skill Gap**: Universities must incorporate AI-related courses, certifications, and hands-on projects to prepare students for AI-powered careers. Without structured AI training, graduates may struggle to compete in the modern workforce.

3.4 AI and Employment Concerns
Despite its benefits, AI adoption raises concerns about job security, ethical risks, and algorithmic bias.
- **Job Insecurity & AI Automation:** A survey by McKinsey (2023) found that 35% of employees worry about AI replacing their jobs in the next decade. While AI enhances efficiency, it also leads to workforce displacement in repetitive job sectors.
- **Algorithmic Bias in Hiring**: Mittelstadt et al. (2016) highlight concerns about bias in AI-driven recruitment systems, where hiring algorithms may unintentionally discriminate against candidates based on flawed data patterns. This raises the need for transparent AI governance and ethical AI policies in recruitment.
- **Gig Economy & AI-Enabled Work**: De Stefano (2015) discusses how AI-driven platforms (e.g., Uber, Upwork) redefine employment structures, leading to a rise in temporary and gig-based jobs rather than stable, long-term careers.

IV. RESEARCH METHODOLOGY

This section outlines the research design, data collection methods, and participant details used to assess the impact of AI tools on graduate employability. The methodology aligns with the study's objectives, ensuring that the findings accurately reflect students' awareness, usage, and perceptions of AI in education and employment.

4.1 Research Aim
The primary goal of this study is to examine how AI tools influence graduate employability by exploring:
- Students' familiarity with AI tools and how often they use them.
- AI's impact on skill development and career opportunities.
- Concerns regarding AI-driven job automation and job security.
- Gaps in AI education and the need for workforce training.
- How universities and industries can better prepare students for AI-driven careers.

4.2 Research Design
A mixed-method approach was used to gather both quantitative and qualitative data, ensuring a comprehensive understanding of students' views on AI tools in education and employment.

Method	Purpose
Online Survey	Collect statistical data on AI awareness, usage, and perceptions.
Focus Group Discussions	Gain deeper insights into concerns, expectations, and skill gaps.

This combination allows us to analyze trends from survey data while exploring students' experiences and perspectives in greater detail.

4.3 Data Collection Methods
4.3.1 Online Survey
A structured online survey was designed using Google Forms and shared with students from various universities and colleges in Himachal Pradesh. The survey contained both multiple-choice and open-ended questions, covering:

1. **AI Awareness & Familiarity:** Whether students know about AI tools and their applications.
2. **AI Usage in Education:** How frequently students use AI tools for learning and assignments.
3. **Employability Concerns:** Whether students feel AI will help or harm their job prospects.
4. **Skill Development & Readiness:** How confident students are in using AI in their future careers.
5. **University Support for AI Training:** If students believe their institutions are preparing them for AI-driven careers.

4.4 Participants & Sample Selection

Data collection took place between October 3, 2024, and January 15, 2025. Participants were final-year undergraduate students recruited from various universities and colleges in Himachal Pradesh.

Final Sample Size:
- 250 students were initially invited.
- After screening for duplicate responses and withdrawals, the final sample included 200 students.

Sr. No	University/College	Number of Respondents
1	Dronacharya PG College	30
2	Govt. Degree College Dharamshala	50
3	HPU Shimla	50
4	Govt. College UNA	40
5	SPU Mandi	30

Ethical Considerations:
- Participation was **voluntary**, and students could **withdraw at any time**.
- No **personal identifying information** (such as name, gender, or ethnicity) was collected.
- Data was kept **confidential** and used strictly for research purposes.

4.5 Data Analysis

The collected data was analyzed using both quantitative and qualitative methods:

1. Survey responses were analyzed using descriptive statistics (percentages, frequencies) to identify trends.
2. Focus group discussions were transcribed and analyzed using thematic analysis to identify common themes and concerns.

This mixed-method approach ensures that the study provides both numerical insights (survey) and detailed explanations (focus groups) on how AI tools impact graduate employability.

V. RESULTS AND DISCUSSION

This section presents the findings from the survey conducted with 200 undergraduate students regarding their awareness, perception, and preparedness for AI-driven employability. The data was analyzed quantitatively and qualitatively to provide a comprehensive understanding of how AI tools influence students' career prospects. The results are categorized into key themes, followed by discussions on their implications for higher education and the job market.

Analysis by Pi –chart
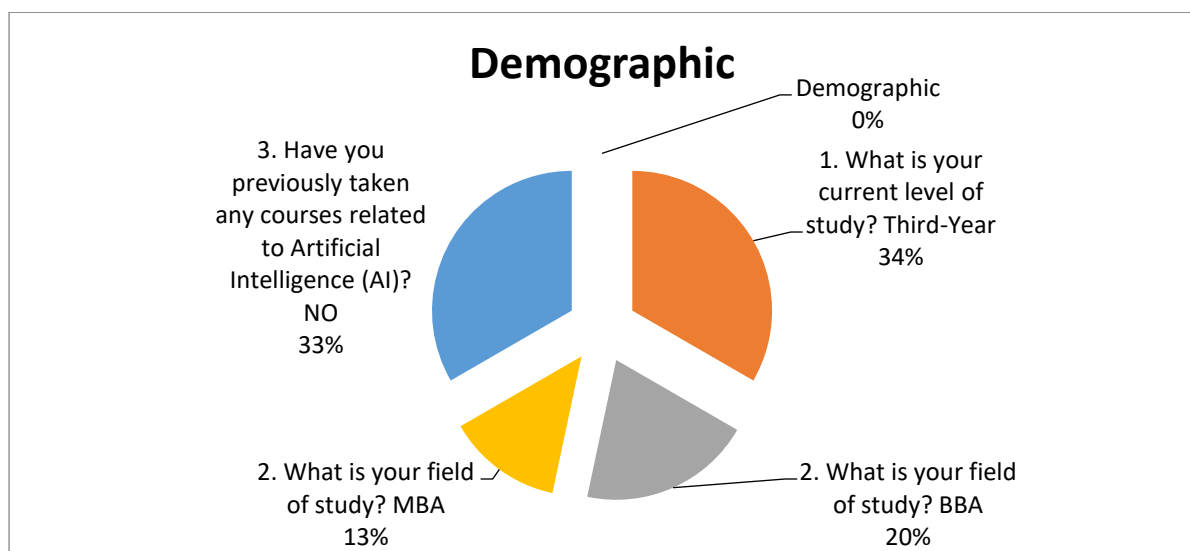
Interpretation:-In pi-chart Show that third year student aware about AI Tools 34% ,BBA Students aware about AI tools - 20%, MBA students only 13/% aware about AI tools .No one students aware previously taken any course related to AI.

Table No .2

Awareness and Usage of AI Tools		
How familiar are you with AI tools	Slightly familiar	127
	Moderately familiar	32
	Not Familiar at All	41
Which AI tools have you used in your academic studies?	ChatGPT	129
	ChatGPT, Grammarly	33
	No Tool	38
How often do you use AI tools for academic purposes?	Rarely	147
	Never	12
	Weekly	41

**Analysis By pi-Chart**
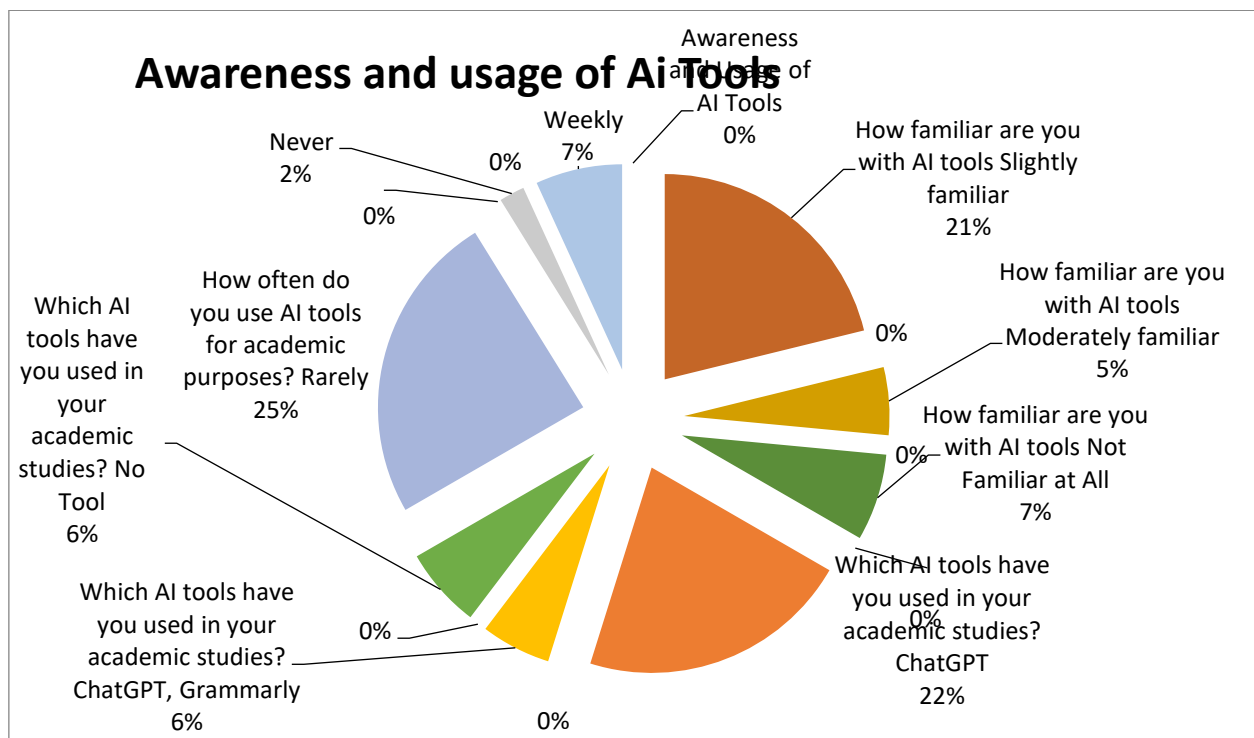
Interpretation:

The results indicate varying levels of familiarity and engagement with AI tools among students in academic settings. A significant proportion of participants (21%) identified as only slightly familiar with AI tools, while 7% reported having no familiarity at all. This suggests that although AI is gaining visibility, comprehensive awareness is still lacking in a notable segment of the student population. In terms of tool-specific usage, ChatGPT emerged as the most commonly adopted platform, used by 22% of students. An additional 6% indicated they use both Grammarly and ChatGPT, which points to a selective approach where students combine tools for different academic needs. However, 6% of respondents noted they have never used any AI tools, which may reflect barriers such as limited digital access, lack of perceived

utility, or skepticism toward AI-assisted learning. Usage frequency patterns further underscore this disparity. While 25% of students reported rare usage of AI tools, only 7% indicated weekly use. Moreover, 2% of students stated they had never used AI tools at all. These figures highlight the uneven integration of AI technologies into students' academic workflows.

Table No. 3

AI's Role in Education and Employability		
Do you believe AI tools improve your learning experience?	Yes	156
	No	24
	Unsure	20
In what ways do AI tools impact your education?	Enhances creativity and problem-solving	61
	Improves writing and grammar skills	139
Do you think AI tools are making you more employable?	yes, somewhat	46
	No, not at all	61
	No, not really	31
What skills do you think are becoming more important due to AI integration in workplaces?	AI literacy and usage skills	98
	Data analysis and interpretation	102

Bar graph :-
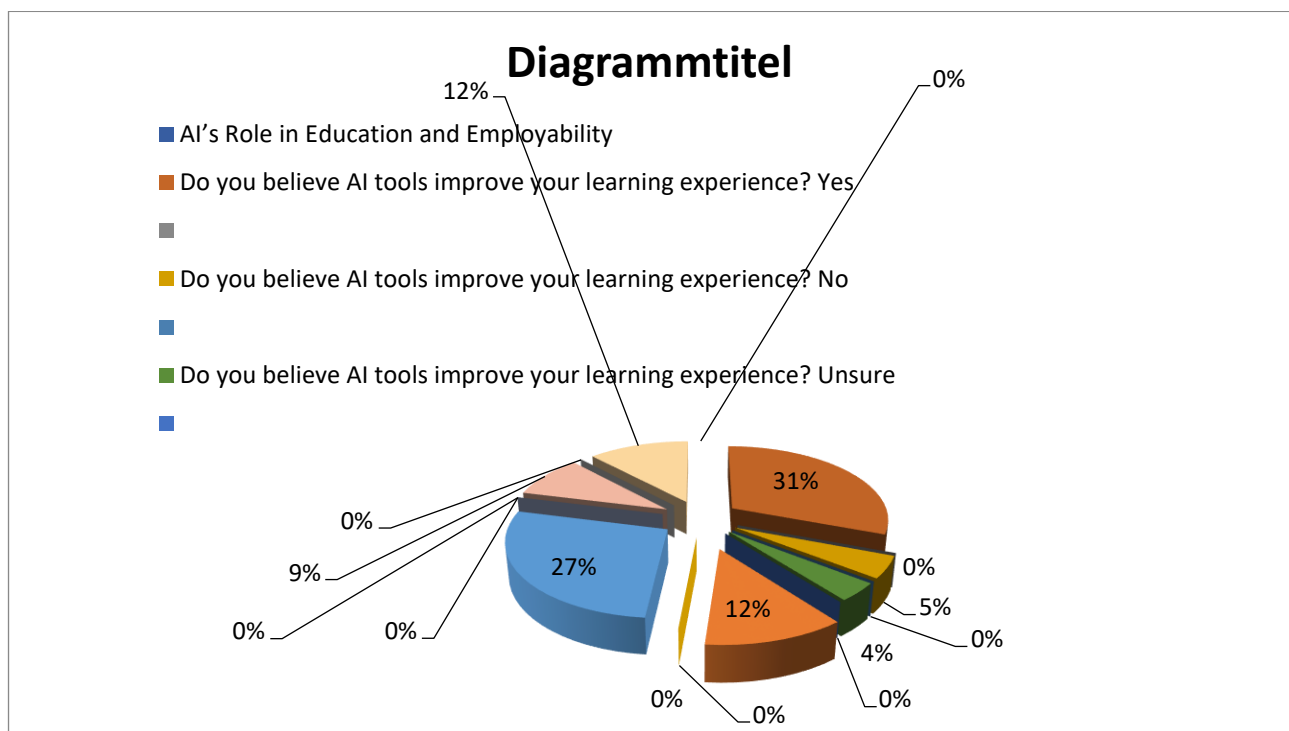
Interpretation:

The chart presents data on students' perceptions regarding the role and impact of AI tools in education and employability. The most significant portion of respondents (31%) believe that AI tools positively influence their education by enhancing creativity and problem-solving skills. This suggests a growing recognition of AI's potential to support higher-order cognitive abilities rather than merely serving as tools for automation or convenience. Approximately 27% of participants acknowledged AI's role in both education and employability, indicating that students view AI tools as instrumental not only for academic success but also for future career readiness. This perspective aligns with current discourse on AI-driven skill development and the increasing integration of AI in workplace environments. When asked directly whether AI tools improve their learning experience, 12% responded affirmatively, reinforcing the notion that a portion of students experience tangible benefits in using these tools for academic enhancement. Interestingly, another 12% were unsure, revealing a knowledge gap or lack of sufficient engagement that may limit informed opinions.
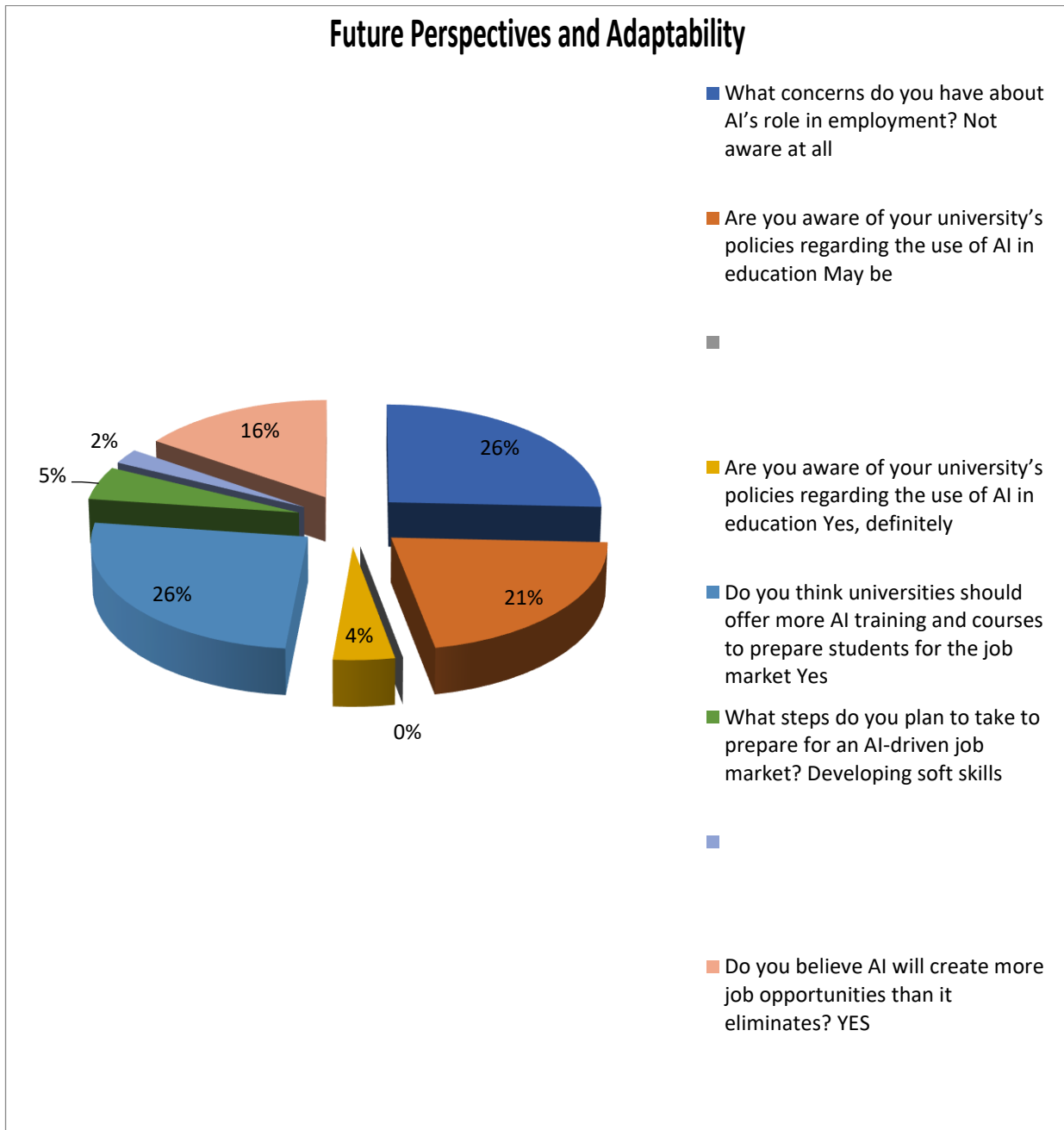
A smaller segment of students expressed skepticism or negative perceptions—9% responded that AI tools do not improve their learning experience, while 5% were uncertain about their impact. Only 4% reported other impacts that were not directly related to creativity or problem-solving.

Table No .4

Future Perspectives and Adaptability		
Do you think AI will replace jobs in your field of study	Job displacement due to automation	83
	Lack of AI-related training in universities	117
What concerns do you have about AI's role in employment?	Not aware at all	200
Are you aware of your university's policies regarding the use of AI in education	May be	166
	Yes, definitely	34
Do you think universities should offer more AI training and courses to prepare students for the job market	Yes	200
What steps do you plan to take to prepare for an AI-driven job market?	Developing soft skills	40
	Gaining hands-on experience with AI tools	142
	Learning AI-related skills	18
Do you believe AI will create more job opportunities than it eliminates?	YES	120
	No	80

Would you be interested in workshops or training sessions on AI's role in employability	YES	200

Graphically:

Future Perspectives and Adaptability

- What concerns do you have about AI's role in employment? Not aware at all
- Are you aware of your university's policies regarding the use of AI in education May be
- Are you aware of your university's policies regarding the use of AI in education Yes, definitely
- Do you think universities should offer more AI training and courses to prepare students for the job market Yes
- What steps do you plan to take to prepare for an AI-driven job market? Developing soft skills
- Do you believe AI will create more job opportunities than it eliminates? YES

Interpretation:-

The chart explores student perceptions regarding institutional readiness and personal adaptability to AI-driven educational and employment landscapes. A significant proportion of respondents (26%) indicated unawareness of AI's role in employment, signaling a potential disconnect between technological advancements and student preparedness for workforce implications. An equal percentage (26%) agreed that universities should offer more AI-focused training and courses to better equip students for evolving job market demands. This parity underscores a critical need for bridging awareness gaps through institutional support and curriculum enhancement.

Further insights reveal that 21% of students are only "maybe" aware of their university's policies regarding AI in education, while a mere 4% claimed definite awareness. This disparity points to a pressing need for greater transparency and communication from educational institutions regarding their AI governance and integration strategies. From a workforce perspective, 16% of respondents expressed optimism, believing that AI will create more job opportunities than it eliminates. Meanwhile, only a small fraction (5%) reported taking proactive steps such as developing soft skills to prepare for an AI-influenced job market. An even smaller group (2%) recognized any other future concerns related to AI, suggesting limited engagement with strategic career planning in response to automation trends.

5.5 Summary of Findings

This study aimed to assess student awareness, perceptions, and engagement with artificial intelligence (AI) tools across academic levels and disciplines. The results reveal a mixed level of understanding and usage, with several key patterns emerging:

- **Awareness by Academic Standing**: Third-year students showed the highest level of awareness of AI tools (34%), followed by BBA students (20%) and MBA students (13%). Importantly, no student reported having taken a formal course related to AI, indicating a significant curricular gap in AI education across programs.
- **General Familiarity and Usage Patterns**: While 21% of respondents were only slightly familiar with AI tools, 7% had no familiarity whatsoever. ChatGPT was the most commonly used tool, with 22% of students indicating its use. A smaller group (6%) reported using both ChatGPT and Grammarly, reflecting a selective, tool-specific adoption. However, 6% of students had never used any AI tools, highlighting barriers such as access, skepticism, or lack of perceived need.
- **Frequency of Use**: The frequency of AI tool usage was relatively low. Only 7% of students reported weekly use, while 25% used AI tools rarely. A minority (2%) had never used them, underscoring inconsistent integration into academic routines.
- **Perceived Educational Impact**: The most commonly cited benefit of AI tools was their ability to enhance creativity and problem-solving, as reported by 31% of respondents. Additionally, 27% recognized AI's relevance in both academic development and employability, suggesting a growing appreciation for the broader role of AI in shaping future competencies.
- **Learning Experience and Skepticism**: Only 12% of students felt that AI tools definitively improved their learning experience, while another 12% remained unsure. Skepticism was also evident: 9% believed that AI tools did not enhance their academic experience, and 5% were uncertain about their overall impact. A small portion (4%) cited impacts unrelated to learning enhancement.
- **Institutional Awareness and Policy Readiness**: Institutional engagement appears limited. Only 4% of students were fully aware of their university's AI policies, while 21% were only vaguely aware. A notable 26% of students reported being unaware of AI's implications for employment, signaling a potential disconnect between technological advancement and academic support structures.
- **Student Preparation for AI-Driven Careers**: While 26% of students believe that universities should offer more AI training to prepare students for the job market, only 5% are currently taking proactive steps, such as developing soft skills. Additionally, 2% acknowledged broader concerns related to AI but did not specify any particular response strategies.
- **AI and Employment Outlook**: Optimism about AI's impact on the job market was modest. Only 16% believed that AI would create more job opportunities than it eliminates, suggesting a cautious perspective on the long-term implications of AI integration in the workforce.

Collectively, these findings indicate a transitional phase in the adoption of AI in higher education. Students are becoming aware of AI's potential but lack structured opportunities to fully engage with it, both academically and professionally.

5.6 Conclusion

This research highlights the uneven landscape of AI awareness and engagement among students in higher education. While tools such as ChatGPT are gaining traction, overall usage remains infrequent, and formal exposure through university-led initiatives is virtually nonexistent. The absence of prior coursework related to AI across all student groups points to a critical gap in academic programming that must be addressed if institutions are to prepare students for an AI-augmented future.

Students recognize AI's potential in enhancing creativity and problem-solving and its dual role in education and employment. However, widespread uncertainty, low policy awareness, and limited institutional support hinder full

adoption and confidence. Although some optimism exists regarding AI's role in future job creation, proactive preparation—such as soft skill development and policy literacy—remains limited.

To support the next generation of AI-literate professionals, educational institutions must implement structured AI training, integrate AI ethics and application into curricula, and ensure transparent communication regarding AI policies. Doing so will empower students to navigate the complexities of an AI-driven world with both competence and confidence.

5.8 Recommendations

Based on the findings and identified limitations, the following recommendations are proposed to improve AI awareness, literacy, and strategic integration within higher education:
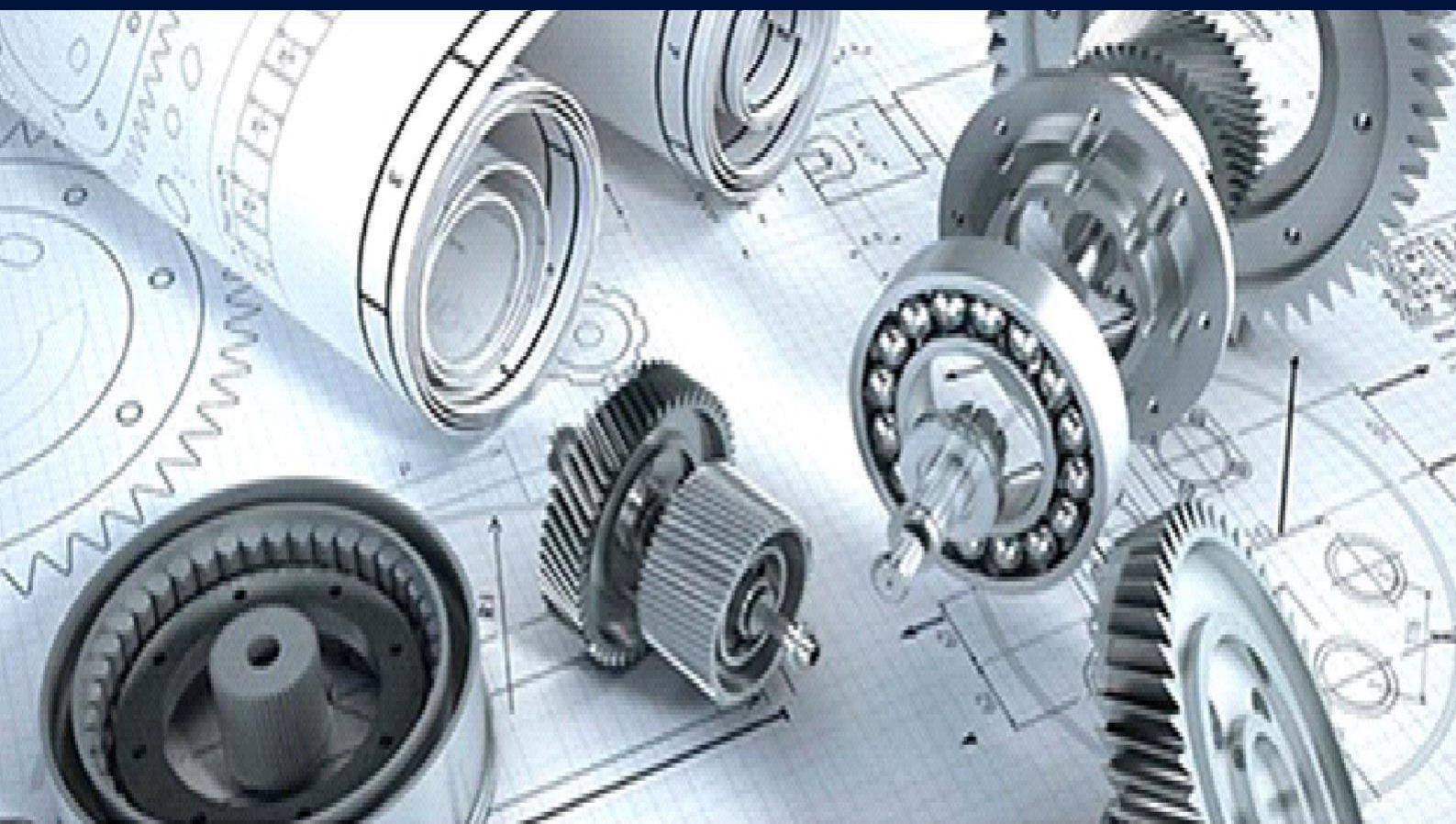
1. **Curriculum Integration**:
   Universities should embed AI literacy modules, including ethical use, applications, and basic technical skills, across all disciplines—not just computer science—so students are universally prepared for AI-influenced futures.
2. **Formal Training and Certification**:
   Institutions should provide workshops, certification courses, or credit-bearing classes that formally introduce students to AI tools, use cases in their field, and evolving AI trends.
3. **Transparent Policy Communication**:
   University leadership should ensure that all students are made aware of institutional policies regarding the ethical use of AI in coursework and research. Clear guidelines should be distributed through orientation programs, course syllabi, and digital platforms.
4. **Increased Faculty Engagement**:
   Faculty development programs should train instructors to effectively incorporate AI tools into their pedagogy and assignments, promoting responsible usage among students.
5. **Promote Interdisciplinary Collaboration**:
   Encourage interdisciplinary AI projects and innovation labs where students from diverse academic backgrounds can work together to apply AI in real-world contexts (e.g., business, healthcare, humanities).
6. **Support Soft Skills Development**:
   Alongside technical training, universities should facilitate programs that build adaptive skills—critical thinking, creativity, communication—that remain relevant in AI-augmented job markets.
7. **Ongoing Research and Evaluation**:
   Institutions should invest in continuous research on AI tool adoption, including student learning outcomes, employment trajectories, and AI's role in shaping future educational models.

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