

# IMPACT OF AI IN EDUCATION

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## Abstract

*Artificial Intelligence (AI) has been identified as one of the most significant technological advancements of the 21st century, with the potential to transform many aspects of society, including education. This systematic review aims to explore the impact of AI on education by analyzing empirical studies from various academic databases. The review identifies three main areas where AI has been implemented in education: intelligent tutoring systems, personalized learning, and grading automation.*

*For the study, a quantitative research method was used, and a sample of 100 respondents was selected through a purposive sampling method. The data was collected through well framed questionnaire and the data were analysed through percentile analysis.*

*The findings suggest that AI-based educational tools have a positive impact on student learning outcomes, including increased academic achievement, higher retention rates, and improved engagement. Moreover, AI-based tools can also benefit educators, by automating administrative tasks and providing real-time feedback to students. However, the review also highlights several concerns related to AI in education, including privacy concerns, bias, and the potential for technology to replace human teachers. The study concludes that while AI-based educational tools show promise, more research is needed to better understand their effectiveness, as well as their potential drawbacks, in order to fully leverage their benefits for education.*

**Keywords:** *Artificial Intelligence, education, personalized learning, privacy concerns.*

## Introduction

Artificial Intelligence (AI) has been making a significant impact on various industries, and the field of education is no exception. The use of AI in education has the potential to revolutionize the way we teach and learn, by providing personalized learning experiences, automating routine tasks, and analyzing data to identify areas where students may be struggling. While AI holds immense promise for transforming education, it also raises concerns around privacy, bias, and the ethical implications of using machines to teach and evaluate students. As such, there is a need to explore the impact of AI in education to better understand its potential benefits and challenges and ensure that its implementation is ethical and effective.

The purpose of this research paper is to examine the impact of AI in education, including its potential benefits and challenges. We will review the current literature on the use of AI in education, including the various applications of AI, such as personalized learning, intelligent tutoring systems, and automated grading. We will also explore the ethical and social implications of using AI in education, including issues of bias, privacy, and the potential for AI to replace human teachers.

This research paper will contribute to the existing literature on the use of AI in education by providing a comprehensive review of the current state of the field. We will examine the potential benefits of AI in education, including improved learning outcomes, increased efficiency, and increased access to education. We will also explore the challenges of implementing AI in education, including concerns around privacy, bias, and the ethical implications of using machines to teach and evaluate students. Ultimately, this research paper will provide insights into the potential of AI in education, as well as the need for careful consideration of its ethical and social implications.

## Review of Literatures

*Gurumurthy Kasinathan (2021), Making AI Work in Indian Education this essay investigates how artificial intelligence (AI) may affect educational practices and results. It looks at the main issues that AI policy and*

programming frameworks should deal with in order to facilitate inclusive, universal, and ethical education in India. The article is based on desk research done by IT for Change and interviews with educationalists and organizations engaged in the field of AI and education.

*Sheshadri Chatterjee & Kalyan Kumar Bhattacharjee (2020), Adoption of artificial intelligence in higher education: a quantitative analysis using structural equation modelling the emergence of artificial intelligence (AI) use and application in higher education in India has created new opportunities and difficulties. The use of AI will lead to a significant change in governance across the board for Indian Institutes of Higher Learning. The potential use of AI in education includes an examination of the educational consequences, including how teachers would be enriched, how students would learn, and how fast and accurate judgments could be made in higher education institutions. This is significant since the massification of higher education has increased the burden. Given this situation, AI assistance is crucial. According to this viewpoint, an essential topic is whether AI will be used in higher education. This study's goal is to determine how stakeholders might be able to accept it.*

*Ashraf Alam (2022), Employing Adaptive Learning and Intelligent Tutoring Robots for Virtual Classrooms and Smart Campuses: Reforming Education in the Age of Artificial Intelligence the introduction of new technologies has resulted in a significant evolution in teaching and learning techniques. As a result of the recent rapid growth of AI technology, artificial intelligence (AI) applications in educational settings are becoming more and clearer. This article examines several applications of educational-AI, including adaptive learning, smart campuses, teacher evaluation, intelligent tutoring robots, and virtual classrooms. After examining how AI affects teaching and learning, it is evident that AI has a positive impact on student learning outcomes as well as the caliber of education delivered by teachers. The essay ends with a discussion of the potential difficulties that implementations of AI in education, as well as how AI has the potential to enhance schools and support educational reforms.*

*Rajesh Hooda and Dinesh Kumari (2022), Impact and Legal Implications of Artificial Intelligence in Higher Education in India the role of AI in higher education in India is covered in the study. AI is a relatively new method of teaching and learning in various contexts. It demonstrates the rising need and the necessity of addressing the access mechanism, rules, and laws for AI. It is crucial to comprehend whether there are any policies, programs, incentives, schemes, or visions available to improve the use of AI in India and advance the higher education system. It explains the idea of AI, how it has changed, what it can and cannot do, as well as its effects and uses in education. It also outlines several instances of AI being used to improve education. The paper describes a few AI tools, such as Thinkster Math, Brainly, Nuance, Cognil, Kidsense, Content Technologies, etc., as well as how AI is now used in education and how it helps educators, teachers, and students. How AI will positively impact the education sector in the near future will be the main topic of this research study. Although AI has had a significant impact on the education sector, comprehensive transformation will take more time. In order to gather information about instructors', students', and other stakeholders' experiences with AI and desirable future trends, observation methods will be used.*

*Luckin, Rose; Holmes, Wayne; (2016), Intelligence Unleashed: An argument for AI in Education the objectives in mind when we prepared this brief essay on artificial intelligence in education (AI-Ed). The first was to define AI-Ed and describe its objectives, structure, and operation to a reader who was interested but not a specialist. After all, we can only get past the worries connected with AI that are based on science fiction by gaining a certain level of comprehension. The second objective was to present the case for what AI-Ed can contribute to education today and in the future with the intention of enhancing learning and life outcomes for all.*

## Statement of the Problem

The increasing use of artificial intelligence (AI) in education has the potential to transform the way we teach and learn, but also raises important questions and concerns. While AI-powered tools can help to personalize learning, improve student engagement and outcomes, and provide new insights into student behavior and performance, they also present challenges related to privacy, bias, and the role of teachers and other educational professionals.

This research paper aims to address the following problem statement: What is the impact of AI on education, and how can it be harnessed in a way that maximizes its potential benefits while addressing its ethical, social, and economic implications?

## Objectives of the Study

The objective of this research paper is to examine the impact of AI on education, with a focus on its potential benefits, challenges, and ethical considerations. The implementation of AI in education also raises important questions about the role of teachers and other educational professionals. Specifically, this research paper aims to achieve the following objectives:

- The role of teachers and other educational professionals in the era of AI, and to identify ways in which they can adapt and evolve their practices to best serve students.
- The impact of AI on the future of work and the skills that will be needed in the workforce, and to explore how education systems can prepare students for this new reality.
- The ethical and social implications of AI in education, including issues related to privacy, bias, and transparency.

## Methodology

This study has been conducted only through primary data and secondary data. To acquire the primary data questionnaire were used with different people in the target population. The sample size was set at 100 respondents from various occupations and income levels. The purposive sampling method was used. The respondents were selected from different occupations. The questionnaires were designed to assess respondents' knowledge of AI in education, role of teachers and other educational professionals. The questionnaire was administered to the selected respondents, and the data collected was analysed. The data collected were edited, codified and tabulated according to the needs of the study. The data were further used for statistical analysis to draw inferences and conclusions about the impact of AI education and AI-based tools and approaches.

## Scope and Limitations of the Study

This study was conducted among 100 respondents from different occupations. The sample size was limited due to a time constraint, the earlier studies were limited in number, and many of the respondents were unable to assess the meaning and relevance of the questions in the interview schedule. These limitations affect the accuracy of the findings and must be taken into consideration.

## Findings

## Demographic Profile

Table 1.1

	VARIABLES	FREQUENCY	PERCENTAGE
Age	Bellow 20	48	48
	21 - 30	31	31
	31 - 40	13	13
	41 Above	8	8
Employment Status	Students	66	66
	Unemployed	24	24
	Employed	7	7
	Self Employed	3	3
Income Category	Less than 15,000	26	26
	15,000 - 30,000	12	12
	30,000 - 45,000	5	5
	45,000 - 60,000	1	1
Gender	Male	76	76
	Female	27	24
Community Type	Rural	12	12
	Urban	80	80
	Suburban	8	8
Educational Qualification	SSLC	3	3
	HSC	11	11
	UG	64	64
	PG	17	17
	PHD	5	5

Source: Primary Data

The demographic profile from **Table 1.1** factors such as gender, age, educational status, level of income etc., play important role in the view of different people from different environments. The view about a problem differs from person to person which change according to their residence, occupation, educational qualification etc., Thus it becomes essential to take into account of these variables while studying the view of different people on impact of AI. Nearly 64% of the respondents are of the age below 20 years. Almost 66% of the respondents are students and 26% of the respondent's annual income falls under the slab of less than 15,000. Most of 76% are male and 80% of the respondents are residing in urban community. Nearly 64% of the respondents are UG (Under Graduates).

Concept Concerns, Likeliness &amp; Familiarity of AI Table 1.2

VARIABLES		FREQUENCY	PERCENTAGE
Concept of AI	Very Familiar	43	43
	Familiar	36	36
	Neutral	17	17
	Unfamiliar	2	2
	Very Unfamiliar	2	2
Concerns as a student	Very Concerned	20	20
	Concerned	40	40
	Neutral	36	36
	Unconcerned	4	4
	Very Unconcerned	0	0
Familiarity of privacy implications	Very Familiar	4	4
	Familiar	39	39
	Somewhat Familiar	34	34
	Unfamiliar	16	16
	Very Unfamiliar	13	13
Likeliness to help educational equality	Highly Likely	18	18
	Likely	40	40
	Neutral	37	37
	Unlikely	3	3
	Highly Unlikely	2	2
Creating impact in education	Strongly Agree	32	32
	Agree	42	42
	Neutral	22	22
	Disagree	4	4
	Strongly Disagree	0	0
Likeliness to use ai tool if available	Highly Likely	19	19
	Likely	38	38
	Neutral	36	36
	Unlikely	4	4
	Highly Unlikely	3	3
Ai a boon for education	Strongly Agree	43	43
	Agree	36	36
	Neutral	17	17
	Disagree	4	4
	Strongly Disagree	3	3

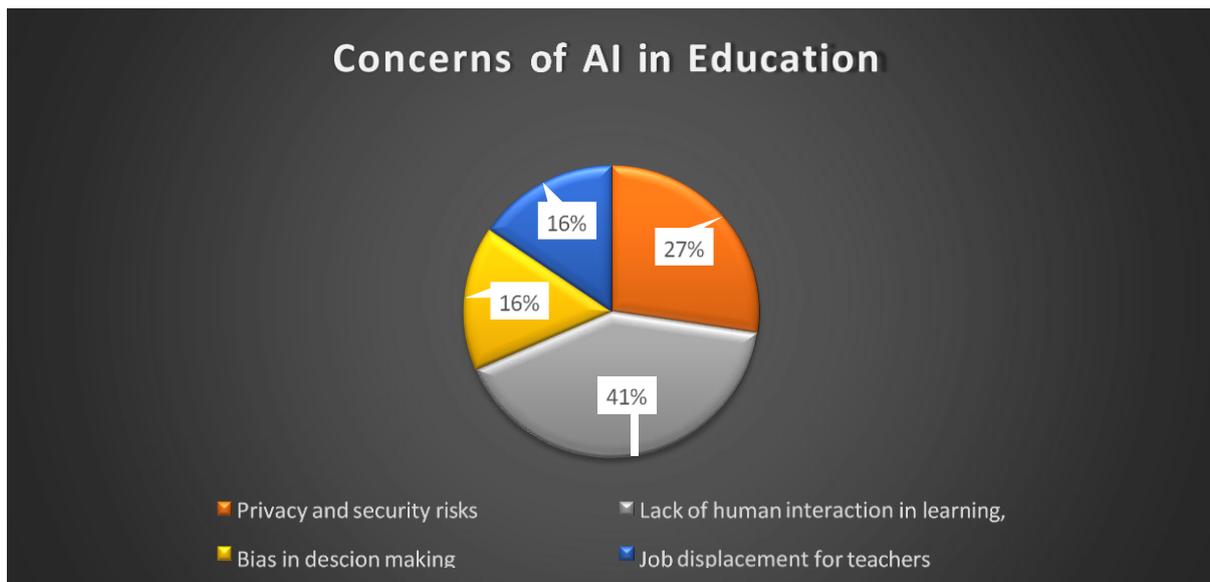
Concerns as a student	Very Concerned	20	20
	Concerned	40	40
	Neutral	36	36
	Unconcerned	4	4
	Very Unconcerned	0	0

Source: Primary Data

The analysis of the different view of recession to the respondents are presented in the **Table 1.2**. Nearly (43%) are very familiar with the concept of AI. (40%) of the respondents are concerned about AI. Almost (39%) of the people are are familiar about te privacy implications of AI. Most of the (40%) of the respondents think that AI is likely to help the Educational Equality. Nearly (42%) of the respondents agree that AI will create an impact in education. Total of (38%) of the people are likely to use AI tool if it were available. Nearly (36%) of the people Agree that AI is a boon for education. Most (40%) of the people are Concerned as a student about AI.

**Concerns of AI in Education**

Chart 1.1

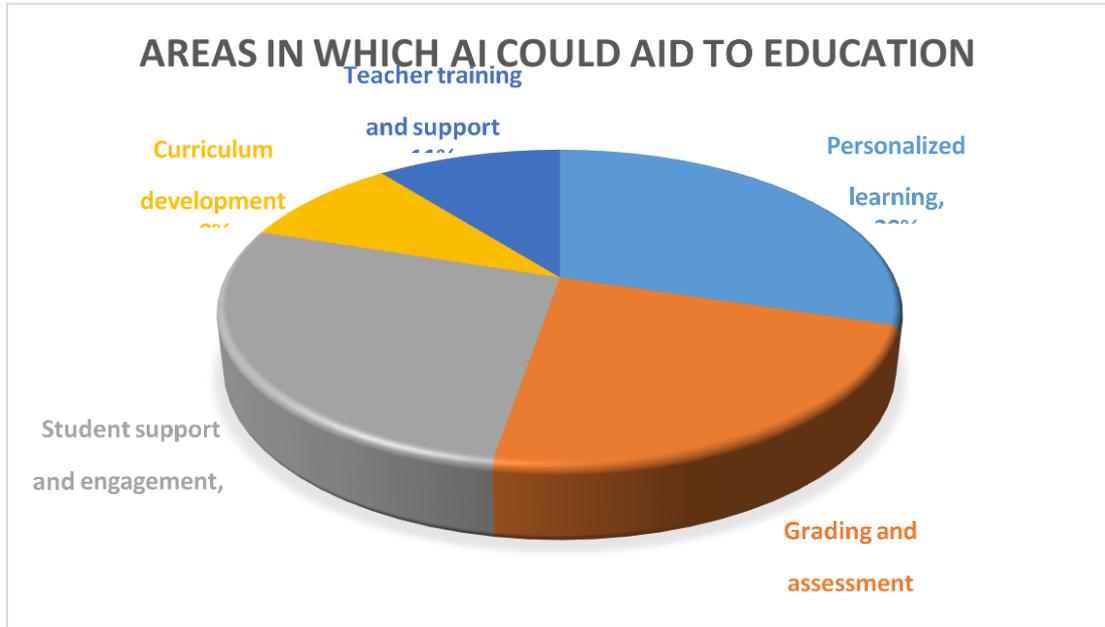


Source: Primary Data

The analysis of concerns of AI the respondents are presented in the **Chart 1.1**. Nearly (41%) of the respondents are concerned about the lack of human interaction in learning.

**Areas in Which AI Could AID in Education**

**Chart 1.2**

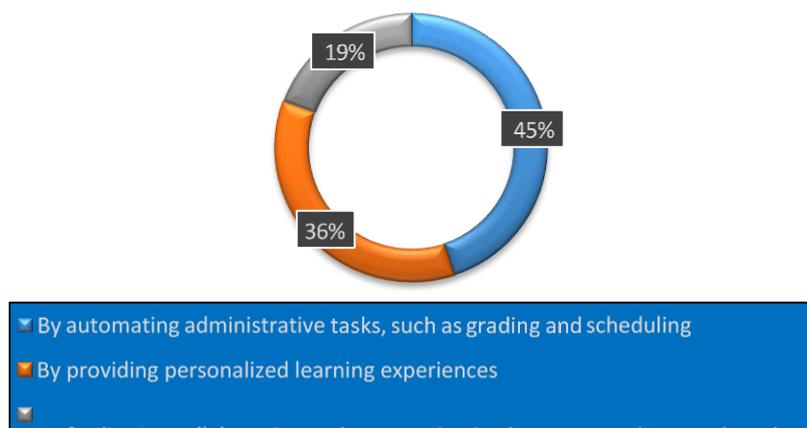


The results of the occupation that areas in which AI could aid in education are represented in the **Chart 1.2**. Almost (30%) of the respondents feel that AI should aid to personalized leaning.

**How AI Can Benefit Education**

**Chart 1.3**

**HOW AI CAN BENEFIT EDUCATION**

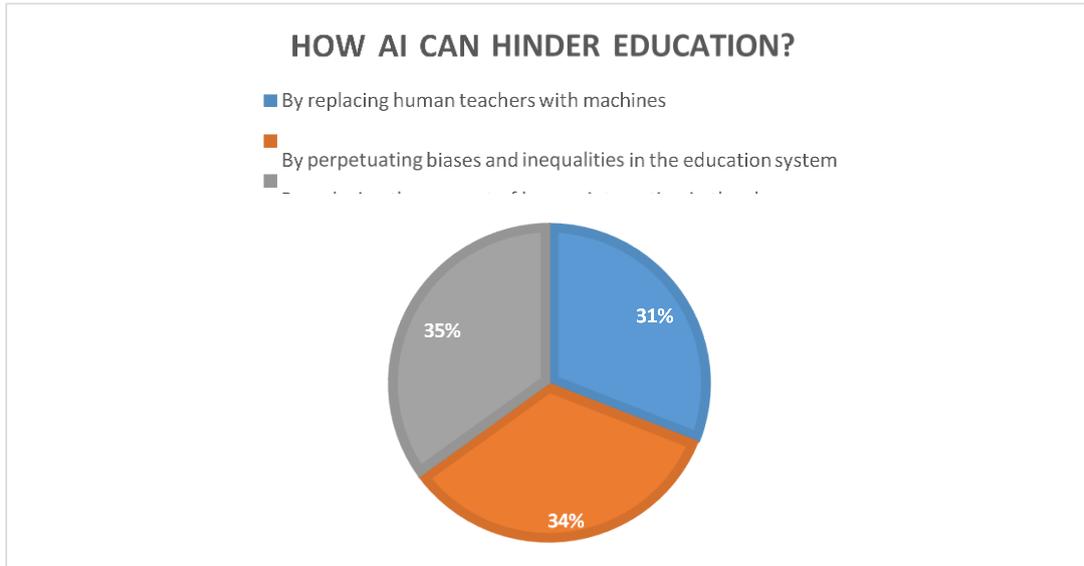


*Source: Primary Data*

The results of the occupation that how AI could benefit education is represented in the **Chart 1.3**. Almost (45%) of the respondents feel that by automating administrative tasks such as grading and scheduling.

How AI Can Hinder Education?

Chart 1.4



Source: Primary Data

The results of the occupation that how AI can hinder education is represented in the **Chart 1.4**. Almost (45%) of the respondents feel that AI could hinder education by reducing the amount of human interaction in the classroom.

Table 1.3

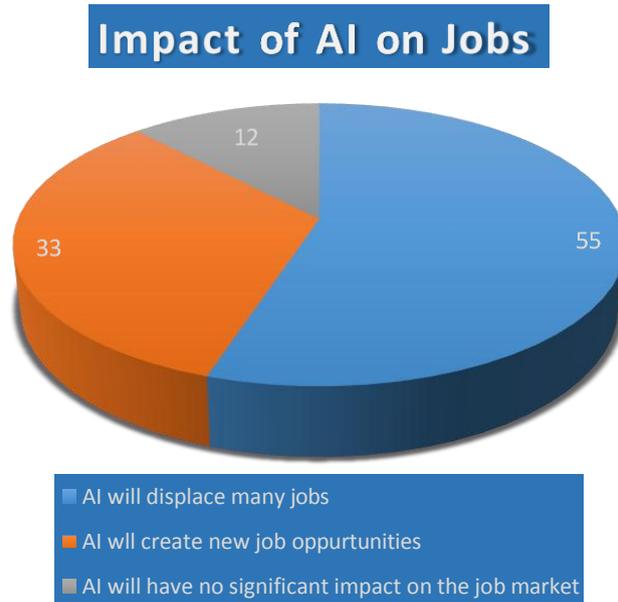
CAN AI BASED SYSTEMS REPLACE HUMAN TEACHERS		
VARIABLES	NO OF RESPONDENTS	PERCENTAGE
Strongly Agree	22	22
Agree	23	23
Neutral	33	33
Disagree	18	18
Strongly Disagree	4	4

Source: Primary Data

The analysis can AI based systems replace human teachers is presented in the **Table 1.3**. Nearly 33% of the respondents has responded neutral which means they are not sure that AI systems can replace human teachers.

Impact of AIN on Jobs

Chart 1.5



Source: Primary Data

The results of the respondents on impact of AI on jobs are represented in the **Chart 1.5**. Most of (55%) of the respondents have responded that AI will displace many jobs.

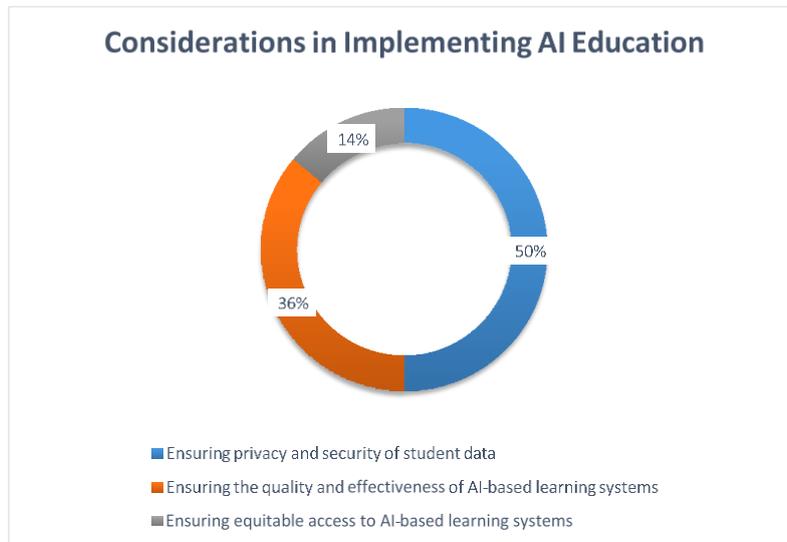
Table 1.4

LIKELINESS TO USE AI BASED LEARNING SYSTEM		
VARIABLES	NO OF RESPONDENTS	PERCENTAGE
Highly Likely	18	18
Likely	32	32
Neutral	42	42
Unlikely	4	4
Highly Unlikely	4	4

Source: Primary Data

The analysis likeliness to use AI based learning systems is presented in the **Table 1.4**. Nearly 42% of the respondents has responded neutral which means they are not sure how likely are they to use AI based leaning system.

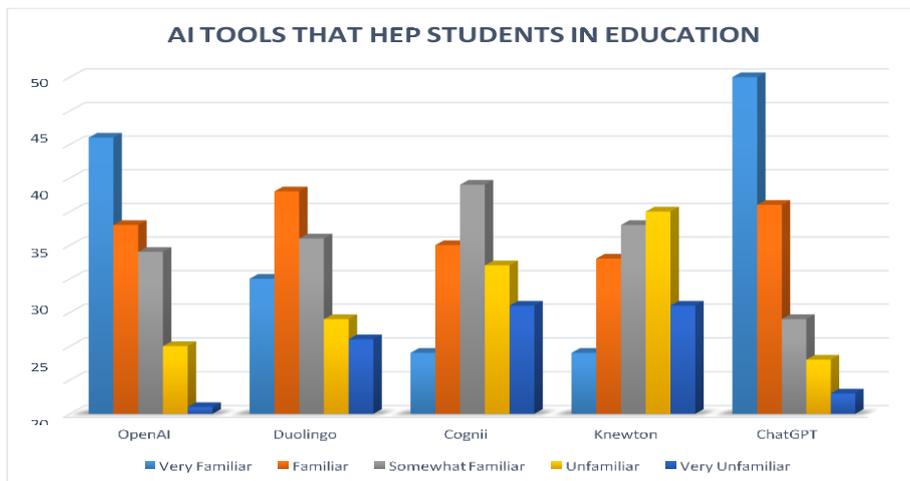
Chart 1.6



Source: Primary Data

The results of the considerations of implementing AI in education is represented in the **Chart 1.6**. Almost (50%) of the respondents feel that ensuring privacy and security of student data.

Chart 1.5



Source: Primary Data

Based on the results of the **Chart 1.5**, we can see that ChatGPT is the most familiar company to the respondents, with 50 people rating it as "Very Familiar." OpenAI is also relatively well-known, with 41 people rating it as "Very Familiar." Duolingo and Cognii are somewhat familiar to the respondents, with roughly equal numbers of people rating them as "Familiar" and "Somewhat Familiar." Knewton, on the other hand, is less familiar, with a higher number of respondents rating it as "Unfamiliar" or "Very Unfamiliar."

**Suggestions**

- Compare the effectiveness of AI-based educational tools and platforms with traditional teaching methods. This will help you assess whether AI has the potential to improve student

outcomes and how it can be integrated into educational settings in a responsible manner.

- Investigate how AI-based educational tools and platforms can be used to improve student engagement and motivation, and how they can be effectively integrated into the classroom environment.
- Examine how AI-based educational tools and platforms are changing the roles and practices of teachers, and how they can be effectively trained to use these tools in the classroom.
- Investigate how AI-based educational tools and platforms are changing the way curricula are designed and developed, and how they can be effectively integrated into existing curricula.
- Examine how AI-based educational tools and platforms can be used to improve diversity and inclusion in the classroom, and how they can be effectively designed and implemented to support all students.

## Conclusion

The impact of AI in education has been significant and transformative. AI-powered tools have the potential to revolutionize the way we teach and learn, making education more personalized, accessible, and efficient. From intelligent tutoring systems to automated grading, AI is already being used in a variety of educational contexts, and the possibilities for future applications are virtually limitless.

However, the implementation of AI in education also raises important questions and concerns. Issues such as data privacy, bias, and the ethical use of AI must be carefully considered to ensure that the benefits of AI in education are realized without compromising student safety and wellbeing. Additionally, it is important to recognize that AI is not a replacement for human teachers and that the role of educators in guiding and supporting learners remains crucial.

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