

AI-Powered Assistive Technologies: Promoting Human Wellbeing through Smart and Autonomous Systems

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ABSTRACT

Artificial intelligence is everywhere, and its application in our daily lives is growing. It is a creation that predicts AI will not only help humans execute tasks but also think like them. Artificial intelligence is developing quickly and imitating human cognitive abilities. This study looks at how AI-powered voice assistants, screen readers, and Natural Language Processing interfaces can help students with physical, cognitive, and visual impairments get an inclusive education. The findings show that AI-powered interfaces greatly enhance information accessibility, academic engagement, and autonomy. The study also identifies constraints with regard to accuracy, infrastructure requirements, instructor preparedness, and ethical issues including algorithmic bias and data privacy. The paper offers practical solutions and policy proposals for fair and responsible AI deployment in education in order to solve these issues. These include paying for inclusive infrastructure, developing ethical and technical standards, and providing specialized training for educators. This work adds significantly to the conversation on AI-driven inclusion by fusing theoretical analysis with practical insights. It also lays the groundwork for further technical advancements and empirical confirmations.

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1. INTRODUCTION

Currently, some of the largest IT firms include. The researcher has selected this prospective field of study in light of how human resources will function or perform jobs in the future and how they will react to artificial intelligence [1]. Predictive technologies and apps, which make math tasks inexpensive, will be the foundation of the future economy. India has developed a thriving startup ecosystem and disruptive innovation

attitude in recent years, giving us a unique opportunity to advance AI and reduce the cost of goods and services through its use [2]. But compared to the 1990s, the rivalry is far fiercer, with Chinese Dragon being more agile and dangerous. Our economic structure and changes must be more proactive, futuristic, and provide sufficient incentives for AI development. To accomplish this, we must see beyond EVs and bullet trains.

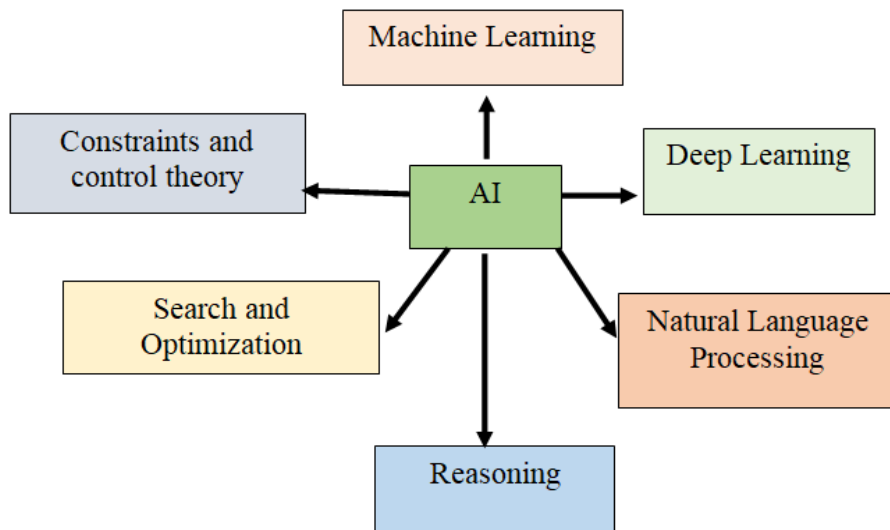


Fig. 1. AI Topography

While strong AI will surpass humans at almost every cognitive job, such as operating your automobile, airplane, pacemaker, automated trading system, or electricity grid, the nascent narrow AI would surpass humans at certain specific tasks, such as playing go or solving calculus. As artificial intelligence (AI) has developed, it has undoubtedly become a useful tool for many organizational tasks that were either too repetitious or included too many human dangers [3].

The newest area of research that is arguably having the most impact on global business and economies is artificial intelligence (AI). The current wave of innovation and digitization is more powerful than ever. The scientific discipline of artificial intelligence seeks to build machines that can replicate human cognitive abilities through supervised or self-learning using the data that is readily available. An ecosystem that is truly artificially intelligent can learn on its own. Without relying on pre-established behavioural algorithms, neural networks found in systems such as Google Mind can form connections and derive meaning. Real AI is excellent at self-learning from past iterations, growing smarter over time, and expanding its own knowledge and capabilities. Computer vision, big data, deep learning, and machine learning are just a few of the many technologies that make up artificial intelligence. Numerous technological components support artificial intelligence, a self-learning technology [4].

The goal of natural language processing (NLP), a subfield of computer science and artificial intelligence (AI), is to promote organic human-machine interaction. Machines use programming codes while humans use spoken languages (English, Chinese, Spanish). NLP aims to use the machine learning so that machines can recognize, read, interpret and generate the interaction in natural languages. The deep learning algorithms enable the computers to analyze and

interpret big data and develop artificial intelligence to interact with humans, in way humans understand.

2. REVIEW OF LITERATURE

Artificial Intelligence or AI is the buzzword of sort not only for the computer science practitioners but also for the HR communities and its equally fascinating experts across the globe as well. There are raging debates on whether AI will be enabler or replacement agent for the Human Resources in any organization and the arguments on the either side of the debate are equally interesting and potential areas of research [5].

S P Leo Kumar (2017) has published a paper based on his intense review on AI systems in the field of process planning and manufacturing applications. He highlights the major gap in the research since 2014, as none was targeted towards the use of Computer aided process planning aided by artificial intelligence. The paper addresses the directions for the future research in making more wide-based application of AI systems [7].

Yang, et.al (2017) in their paper titled, "Survey on artificial intelligence for additive manufacturing, highlight the increased use of 3D printing for complex products in the manufacturing industry and how Artificial Intelligence is becoming a great enabler. AI is enabling hugely customized, highly efficient, very high quality and intelligent solutions involving 3D printing for the manufacturing industry. Collaborative use of the AI algorithms, cloud computing and IoT are enabling the service on-demand and optimum utilization of shared resources for the effective service delivery to the clients [8].

The use of AI in intelligent manufacturing through the integration of AI and the internet is described by Lihou et al. (2017) in their work "Applications of artificial intelligence in intelligent manufacturing: a review,"

which presents another equally fascinating point of view. Such an intelligent manufacturing system integrates artificial intelligence (AI) with the internet to produce a powerful blend of collaboration, cognition, connection, sensing, analysis, learning, control, and execution of material, environment, information, machine, and human in the complete system. The authors go on to state that complete manufacturing ecosystem is witnessing a great evolution, which is triggered by the new era of AI plus internet [9].

The foregoing has been expanded to the Indian context by [10] in their research paper, "Transforming Indian Industries through Artificial Intelligence and

Robotics in Industry 4.0". The authors have exalted that AI would have magnificent effects on various sectors of economy including Manufacturing and Supply Chain. With the inclusion of Machine Learning and AI, manufacturing sector is able to incorporate better demand forecasting, higher flexibility and improved decision making in supply chain activities. In the manufacturing sector, Artificial intelligence-based system is enabling auto correction of processes, reduction in cost of poor quality and generating better production yields. Authors also conclude that in the country like India, Government intervention along with Private sector participation is necessary for the creation of higher relevance of AI.

Table 1. Tools driven by AI and their accessibility aspects.

Type of Tool	Features of Accessibility	Perfect for Learners With	Example
Recognition of Speech	Real-time speech-to-text conversion	deficits in mobility and dysgraphia	AI-driven note-taking dictation software
Interfaces for NLP	simplifies terminology and offers definitions in context.	Language and cognitive deficits	Text comprehension assistance from an AI tutor for pupils with autism
Systems Based on Gestures	allows gesture navigation in place of a keyboard or mouse.	Physical impairments	Hands-free system for classroom communication

Hyder, et.al (2019) in their paper related to mining industry, published in Journal of Database Management, exalt at the potential benefits of AI including improved productivity, efficiency, continuous production, workforce safety and 29 reduced exposures to hazardous environment. The industry is already using autonomous trucks in mining [11]. In a GE bulletin paper titled "Artificial intelligence/machine learning in manufacturing and inspection," Aggour, Gupta, and Ruscitto (2019): A GE perspective", presented that GE is building its industrial portfolio of products and solutions using machine learning and AI in combination with physics for designing, manufacturing processes and quality inspection to create a digital transformation [12].

Manchanda, Kaleem, and Schlorke (2020) detailed their research in the paper AI Investments Allow Emerging Markets to Develop and Expand Sophisticated Manufacturing Capabilities. The authors have provided their insights on how AI is becoming increasingly important and integral part of the manufacturing advancements, in addition of robots, I-o-T, especially in the complex processes and products. Leveraging the huge data and increasing computing power, AI is enabling the ease in linking complex global supply chains and manufacturing of sophisticated and expansive products, improving the organizational capabilities and increasing competitiveness [13].

Pillai, et.al (2021) have conducted research on adoption of the Industrial robots empowered by AI, in automotive components manufacturing sector in the

economy like India. The research highlights that such adoption can be beneficial to the organization in terms of improved productivity, lower manpower costs, higher revenues and better product quality, reduced defects. The findings also highlight the limitation of IT infrastructure in India as well as limited Government policy support, do not limit this adoption. The limitation of the adoption is driven by the perception of the high costs and perceived lack of trained manpower [14].

The nature of the study is descriptive. It measures the implementation process of artificial intelligence in automotive industry of Western Region in India. It analyses the employee behaviour towards the adoption of artificial intelligence in the organization and how it is impacting the human resources. The current study offers a substantial opportunity for future research in a related field, combining many extensions with additional examination of the various variables involved [15]. Employee responses regarding AI implementation in the automobile industry served as the foundation for the current study. Research can be conducted in different product and sector categories in light of the growing use of AI in depth. Furthermore, the current research effort may serve as a foundation for future studies that examine the extent of AI technology penetration and how it affects staff characteristics. Whilst all the advances in connected world bring about efficiencies and productivity, these create major psychological challenges for the human factor of the organization

and force to ponder upon: Will AI be enabler or Replacement Agent for Human Resources Working in the Organizations?

Automation has already shown their impact on the workers at shop floor of manufacturing plant and now Artificial intelligence is challenging to middle and strategic level of management by interfering in their cognitive tasks. Siri assists in reminding people for their appointments, IBM Watson is leaving people jeopardized, self-driving cars and chat bots also replacing the human. AI is used in most of the fields.

Then the dilemma or question is: In what sense AI is impacting human resources?

3. METHODOLOGY

This study finds important gaps that need to be filled in order to fully utilize AI in inclusive education by examining current technologies and the difficulties associated with using them. It also offers policy suggestions for raising accessibility requirements, assisting teachers, and reducing moral dilemmas [16].

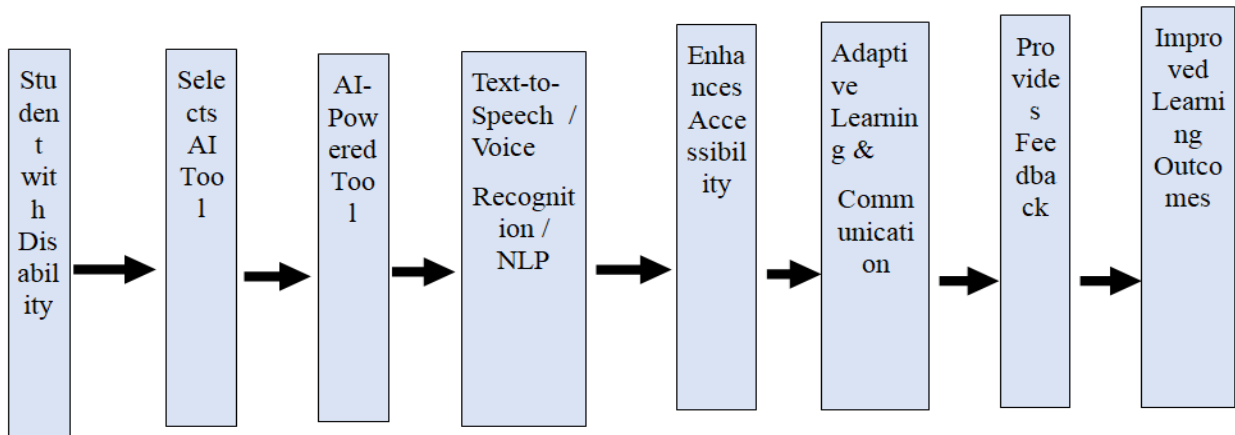


Fig. 2. Flowchart of AI-powered assistive technologies process

AI-powered systems are transforming the educational landscape, particularly for students with physical limitations [17]. Gesture detection technologies allow

students to interact with digital learning materials using natural hand movements, promoting greater accessibility and inclusivity.

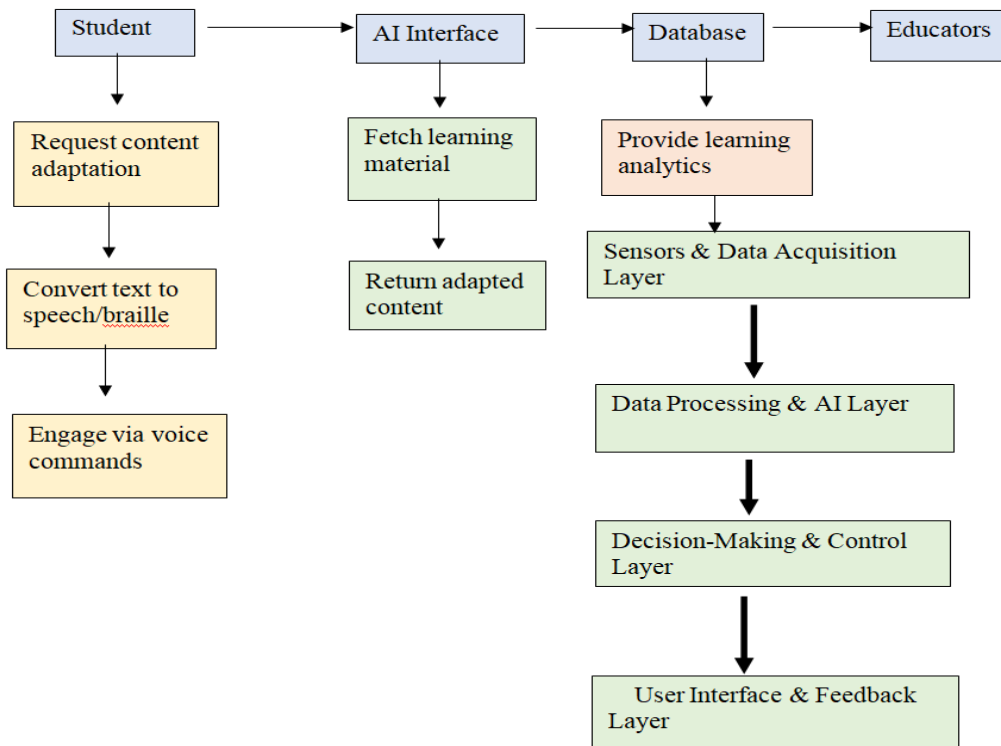


Fig. 3. An illustration of how students engage with AI-powered resources.

Students can use simple gestures like pinching or swiping to navigate digital materials, allowing them to control their learning experience and access various resources with ease. This intuitive interface enables students to focus on learning rather than struggling with technology. A robust technical infrastructure is crucial for successful deployment. This includes stable internet connectivity, cloud-based computing power, and interoperable devices. These components work together to ensure a seamless and effective experience. Teachers need to be trained in both the fundamentals of using AI technologies and how to successfully incorporate them into their lesson plans. This guarantees that teachers can take full advantage of technology and give pupils an excellent educational

experience. The potential benefits of AI tools might not be completely realized without the right infrastructure and training, especially in educational settings with limited resources [18].

3.1 AI-Powered Assistive Technologies

A student writing a tale might be given immediate feedback on grammar and word choice while simultaneously being encouraged to develop their thoughts. Through these exchanges, students gain confidence in their communication skills and become less reliant on teacher assistance.

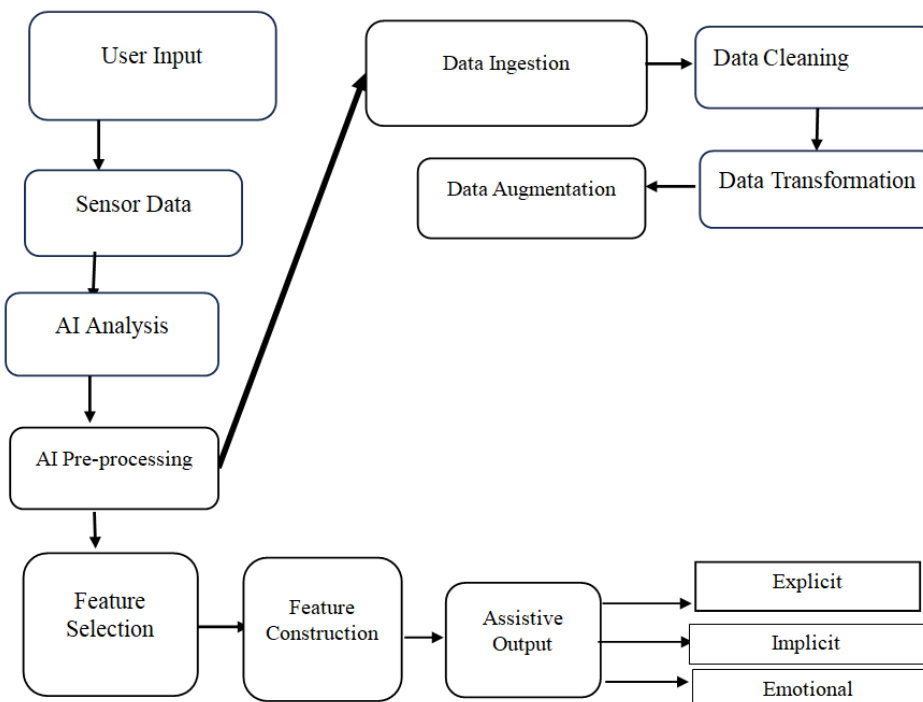


Fig. 4. Proposed framework

Parents, educators, and therapists all expressed unanimity in favor of using AI-assisted technology. Reports from during or following the intervention were the primary source of this input. Therefore, while developing new interventions, a greater focus on organized co-design approaches is required [20]. Co-design was conspicuously absent, and the community's larger requirements about the incorporation of AI-assisted technology into everyday tasks must be addressed. Prior studies have explored general assistive technologies with individuals with ID and used co-design techniques with AI systems in stroke patients. Research on co-designing strategies for AI-assisted devices to improve daily functioning has not yet included individuals with NDCs, their families, or support personnel. Teachers' and therapists' feedback on social robots expressed the belief that these interventions could support autistic children's self-

development and encourage initiative68. Additionally, parents indicated that Superpower Glasses helped them recognize emotions and improve social interactions at home. This shift in behavior was evident even when the parents were not using the gadget. Parents and educators encouraged the growing interest in creating these tools for therapeutic treatments, and the majority of the population demonstrated engagement with the AI-technology interventions overall.

The study of machine learning looks at how computers could mimic human learning to improve skills, learn new information, and maximize system performance. The supervised learning field known as deep learning is built on neural network technology, which was first developed as the perceptron in the 1950s and 1960s. The ultimate goal of deep learning is to provide robots human-like cognitive and learning abilities so they can

effectively identify and process visual, auditory, and textual data. The suggested framework uses blockchain, the Xception model, and attention-based TwinS-SAT technologies to facilitate AI-assisted devices to improve daily functioning.

Xception model with MPO

Deep learning models TwinS-SAT are used to evaluate AI-assisted devices to improve daily functioning. Using a single filter per channel, the Depthwise Convolution operation individually applies a convolution to each channel of the input data. This reduces the processing cost in comparison to traditional convolution. After the depth-wise convolution, the output channels are combined using a pointwise convolution (1x1 convolution), which enables channel-wise feature mixing [21]. The Inception model serves as the inspiration for Xception's Inception-like architecture. The model can capture both local and global features thanks to the architecture's usage of parallel branches with distinct convolutional layers. Depth-wise separable convolution reduces the computational cost in comparison to standard convolution. High precision and efficiency are made possible by the model's ability to learn rich and varied representations.:

$$\text{Logs of } tmax = \frac{\log(\exp(x))}{\sum \exp(x)} = x - \log((\exp(x)\log(\sum \exp(x)))) \quad (1)$$

The proposed model's loss function is optimized using the logarithmic SoftMax of variable x. Additionally, a Regularize function is used to control the layers during training in order to prevent over-fitting.

$$Loss = \frac{1}{n} \sum_1^n Li + \zeta R w_1^2 \quad (2)$$

where $L = L \times \log(\text{avg}(R))$.

Attention with TwinS-SAT

In certain repetitive tasks, like data processing or customer support, where chatbots or virtual assistants are replacing humans, artificial intelligence (AI) solutions have started to show promise. Furthermore, scholars are starting to move these tools or applications out of the AI space and categorize them as advanced analytics and data processing as they become more widely used. As with the early stages of any major advancement, such as the industrial revolution, the invention of computers, personal computers, etc., this evolution will undoubtedly take some time to stabilize, and the most intelligent beings—whether they be artificial or natural—will win out [22]. The purpose of this thesis report is to present study findings about the application and effects of artificial intelligence on human resources employed in the western Indian automobile industry. Let X_t, h_t and c_t be the cell state, input, and control state at timestep t. Considering a series of

inputs(x_1, x_2, \dots, x_m), The h sequence is calculated by the (h_1, h_2, \dots, h_m), and the C-sequence (c_1, c_2, \dots, c_m), as follows:

$$f_t = \sigma(w_f \cdot [h_{t-1}, x_t] + b_f) \quad (3)$$

$$c_t = \tanh(w_c \cdot [h_{t-1}, x_t] + b_c) \quad (4)$$

$$c_t = f_t * c_{t-1} + i_t * c_t \quad (5)$$

$$o_t = \sigma(w_o \cdot [h_{t-1}, x_t] + b_o) \quad (6)$$

$$h_t = o_t * \tanh(c_t) \quad (7)$$

Where σ is a sigmoid logistic function, $*$ is a multiplication of elements, and c_t is the cell's condition that requires updating. w_f, w_i, w_c, w_o and B_f, B_i, B_c, B_o are model parameters that are learnable. In addition, F_t, i_t and O_t are alternatively referred to as input, output, and forget gates. Every unit has a state-based memory cell C_t at time t, it is managed by the three gates mentioned above.

The input gate, output gate, and oblivion gate are the three main gates that comprise the construction. One of these forgetting gates has the following expression:

$$f_t = \delta(w_f \cdot [h_{t-1}, x_t] + b_f) \quad (8)$$

Where δ is the sigmoid's activation function, X_t alludes to the input vector, h_{t-1} indicates the previous layer's hidden vector, and w_f and b_f represent the inputs' weights and bias values, respectively. The input gate's expression is as follows:

$$i_t = \delta(w_i \cdot [h_{t-1}, x_t] + b_i) \quad (9)$$

An updated representation of the current cell status is shown below:

$$c_t = f_t \times c_{t-1} + i_t \times L_t \quad (10)$$

Below is a representation of the current concealed state's final output, which is used as input to the subsequent layer:

$$h_t = o_t \times \tanh(c_t) \quad (11)$$

TwinS-SAT pushes together the two embeddings through the loss term, which is directly adopted and defined as

$$Loss = \sum_i (1 - C_{ii})^2 + \lambda \sum_i \sum_{j \neq i} C_{ij}^2 \quad (12)$$

where C is the cross-correlation matrix calculated between embeddings. An example of the C_{ij} calculation is

$$C_{ij} = \frac{\sum_b Z_{b,i}^A Z_{b,j}^B}{\sqrt{\sum_b (Z_{b,i}^A)^2} \sqrt{\sum_b (Z_{b,j}^B)^2}} \quad (13)$$

Each pair of embedding dimensions in batch b is indexed by i and j, which are in turn indexed by Z_b . The "invariance term," which is the first term of the loss function, is computed between the respective

dimensions of the two embeddings [23]. The model produces more similar embeddings in each epoch when this term is minimized, which occurs when the total of the cross-correlation for each associated embedding dimension gets closer to one. For every pair in the batch, the second term of the loss—known as the "redundancy reduction term"—is computed between the noncorresponding dimensions of the embedding pair. In order to encourage the model to eliminate duplication in the embeddings, this component is minimized when the sum of all cross-correlations across noncorresponding embedding dimensions approaches zero. The λ parameter is used to weight the redundancy reduction phrase. After training, it is anticipated that representations will compress the core spectral time series into a form that is dense with meaning and cluster by commonalities in a multidimensional space. For a variety of downstream applications, it can thus be viewed as an application of compressive sensing and redundancy reduction. The general attention framework, Spatially Separable Self-Attention (SSSA), operates as follows:

$$Z_{ij}^l = LSA(Layer\ Norm(Z_{ij}^{l-1})) + Z_{ij}^{l-1} \quad (14)$$

$$Z_{ij}^l = FFN(Layer\ Norm(Z_{ij}^l)) + Z_{ij}^l \quad (15)$$

$$Z_{ij}^{l+1} = GSA(Layer\ Norm(Z^l)) + Z^l \quad (16)$$

$$Z_{ij}^{l+1} = FFN(Layer\ Norm(Z_{ij}^{l+1})) + Z_{ij}^{l+1} \quad (17)$$

Where $i \in \{1, 2, \dots, m\}$, $j \in \{1, 2, \dots, n\}$. LSA captures fine-grained local textures, including nuclear and cellular details, within a sub-window. GSA, interacts with representative keys from each sub-region $\hat{z}_{ij} \in$

$\mathbb{R}^{k_1 \times k_2 \times C}$ to facilitate information sharing across remote sub-windows.

In order to compile the efficacy of AI treatments, this study employs a methodical strategy to extracting and critically evaluating pertinent studies. It has incorporated user studies that have not been thoroughly investigated in this field prior to the adoption of systematic review methodologies, as well as research that has recruited individuals from community settings. Last but not least, the participation of two reviewers enhances the integrity of these findings and lessens reporting bias, strengthening their trustworthiness [24]. The study's main drawback is the tiny number of research it found, many of which had rather small sample sizes.

4. RESULT AND DISCUSSION

A time-series simulation of temperature and motion sensor readings over 100-time units is represented by the dataset, along with automated actions that are triggered in response to conditions that are detected in Table 1. The system signals possible fever or overheating with a "Send Alert: High Temperature" response when the temperature rises above a predetermined threshold, usually about 38°C. While some combinations of high temperature and motion, particularly abrupt or unusual movements, cause "Potential Fall & Fever" alerts, which indicate potential health emergencies, the system logs motion as "Movement Detected" if motion is detected without a high temperature.

Table 2. Summary of Sensor-Based Health Monitoring Simulation

Time	Temp (°C)	Motion	Action
1	36.15	0	No Action Needed
2	38.52	0	Send Alert: High Temperature!
3	36.36	1	Log Event: Movement Detected
4	38.42	0	Send Alert: High Temperature!
5	38.09	0	Send Alert: High Temperature!
6	38.63	0	Send Alert: High Temperature!
7	36.65	0	No Action Needed
8	38.61	0	Send Alert: High Temperature!
9	38.36	0	Send Alert: High Temperature!
10	38.57	0	Send Alert: High Temperature!
11	36.97	1	Log Event: Movement Detected
12	38.81	0	Send Alert: High Temperature!
13	39.38	1	Send Alert: High Temperature!
14	39.77	0	Send Alert: High Temperature!
15	36.92	0	No Action Needed
16	37.42	0	No Action Needed
17	39.46	0	Send Alert: High Temperature!
18	39.86	0	Send Alert: High Temperature!
19	37.68	0	Log Event: Fever Risk
20	38.00	0	Log Event: Fever Risk
21	39.13	0	Send Alert: High Temperature!

22	36.75	1	Log Event: Movement Detected
23	39.81	0	Send Alert: High Temperature!
24	39.29	0	Send Alert: High Temperature!
25	39.29	0	Send Alert: High Temperature!
26	38.17	0	Send Alert: High Temperature!
27	39.34	0	Send Alert: High Temperature!
28	38.04	1	Send Alert: High Temperature!
29	37.39	0	No Action Needed
30	39.63	0	Send Alert: High Temperature!
31	37.18	1	Log Event: Movement Detected
32	39.77	1	Send Alert: High Temperature!
33	37.93	1	Log Event: Potential Fall & Fever
34	36.73	0	No Action Needed
35	37.11	0	No Action Needed
36	37.94	0	Log Event: Fever Risk
37	36.79	0	No Action Needed
38	38.39	0	Send Alert: High Temperature!
39	39.39	0	Send Alert: High Temperature!
40	37.77	0	Log Event: Fever Risk
41	38.69	0	Send Alert: High Temperature!
42	38.82	1	Send Alert: High Temperature!
43	37.74	1	Log Event: Potential Fall & Fever
44	38.23	0	Send Alert: High Temperature!
45	39.04	0	Send Alert: High Temperature!
46	38.44	1	Send Alert: High Temperature!
47	37.12	0	No Action Needed
48	39.90	0	Send Alert: High Temperature!
49	38.82	0	Send Alert: High Temperature!
50	38.73	0	Send Alert: High Temperature!
51	36.02	1	Log Event: Movement Detected
52	38.59	0	Send Alert: High Temperature!
53	39.92	1	Send Alert: High Temperature!
54	39.11	0	Send Alert: High Temperature!
55	39.23	0	Send Alert: High Temperature!
56	37.17	1	Log Event: Movement Detected
57	39.04	0	Send Alert: High Temperature!
58	37.88	0	Log Event: Fever Risk
59	39.05	0	Send Alert: High Temperature!
60	36.23	0	No Action Needed
61	36.93	0	No Action Needed
62	39.96	1	Send Alert: High Temperature!
63	38.75	0	Send Alert: High Temperature!
64	37.73	0	Log Event: Fever Risk
65	38.62	0	Send Alert: High Temperature!
66	37.93	0	Log Event: Fever Risk
67	37.05	0	No Action Needed
68	39.56	0	Send Alert: High Temperature!
69	37.73	1	Log Event: Potential Fall & Fever
70	37.96	0	Log Event: Fever Risk
71	36.94	0	No Action Needed
72	38.97	0	Send Alert: High Temperature!
73	36.31	0	No Action Needed
74	39.21	0	Send Alert: High Temperature!

75	37.84	1	Log Event: Potential Fall & Fever
76	39.50	0	Send Alert: High Temperature!
77	37.57	0	Log Event: Fever Risk
78	37.47	0	No Action Needed
79	37.30	1	Log Event: Movement Detected
80	36.16	0	No Action Needed
81	37.14	0	No Action Needed
82	37.01	0	No Action Needed
83	39.28	0	Send Alert: High Temperature!
84	36.70	0	No Action Needed
85	36.54	0	No Action Needed
86	36.68	0	No Action Needed
87	39.06	0	Send Alert: High Temperature!
88	38.83	0	Send Alert: High Temperature!
89	39.58	0	Send Alert: High Temperature!
90	39.33	0	Send Alert: High Temperature!
91	38.42	0	Send Alert: High Temperature!
92	39.17	0	Send Alert: High Temperature!
93	36.28	0	No Action Needed
94	37.36	0	No Action Needed
95	38.26	0	Send Alert: High Temperature!
96	39.47	1	Send Alert: High Temperature!
97	36.80	0	No Action Needed
98	39.85	1	Send Alert: High Temperature!
99	38.30	0	Send Alert: High Temperature!
100	38.84	0	Send Alert: High Temperature!

In order to track early symptoms of fever, temperatures in the mid-to-high 37°C range without motion can occasionally result in "Log Event: Fever Risk." "No Action Needed" is displayed when there is no motion and readings fall within a normal range, demonstrating the system's threshold-based decision logic to differentiate between normal and concerning events (figure 5).

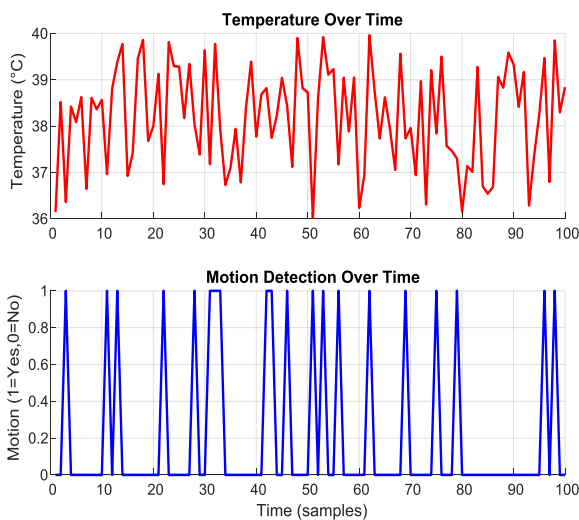


Fig. 5. Temperature over time and motion detection over time

Future studies should examine how AI-powered learning affects students with impairments over the long term, looking at outcomes like digital literacy, psychological health, and academic success (figure 6). To guarantee that inclusion is attained globally, not just in systems with enough resources, comparative research across socioeconomic and cultural contexts is also required. International cooperation is crucial from a policy standpoint in order to create standardized guidelines for moral AI in education, utilizing both Global North and South models.

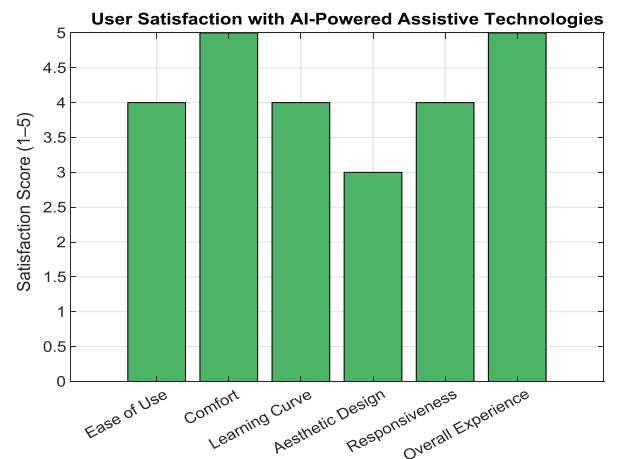


Fig. 6. User satisfaction with AI-Powered assistive technologies

Regulations and pedagogical frameworks must change along with AI capabilities to maintain inclusive, moral, and human-centered education, especially through strategies like participatory development and human-centered design in figure 7. By fusing a conceptual framework with practical examples and doable tactics, this study adds to the expanding corpus of work on inclusive AI. It emphasizes that more than just creativity is needed for the successful application of AI in education; vision, accountability, and teamwork are all necessary. A vital component of daily life is accessibility, which guarantees that people with disabilities can engage completely and freely in society.

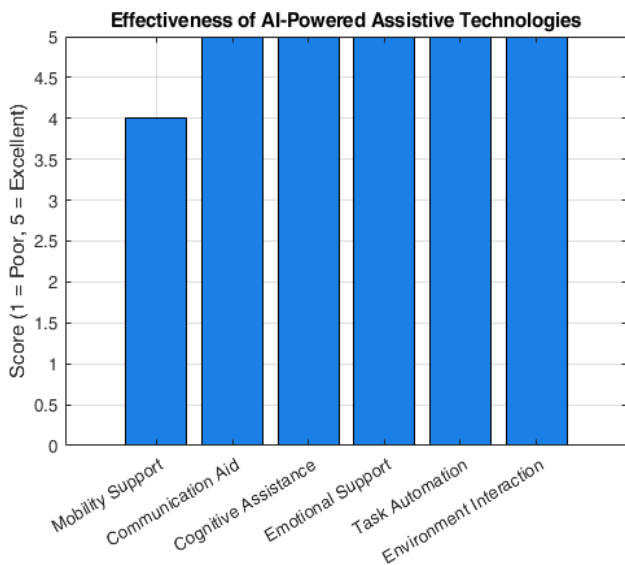


Fig. 7. Effectiveness of AI-Powered Assistive technologies

Education, work, transit, and communication are just a few of the areas where accessibility is crucial, highlighting the need for practical solutions that close the gap between environment and ability (figure 8).

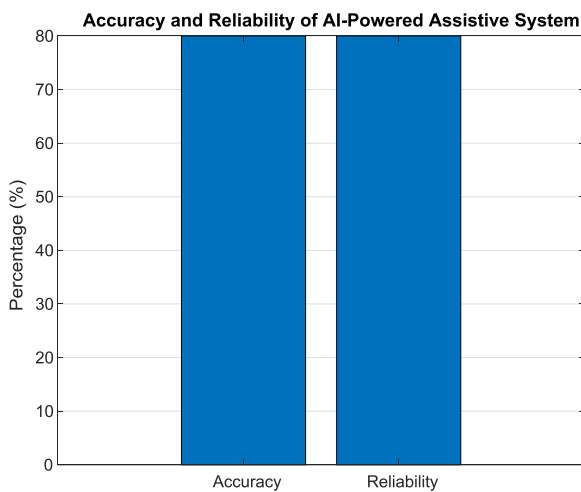


Fig. 8. Accuracy and reliability

By offering instruments and gadgets that improve their capacities and independence, assistive technologies are essential in helping people with impairments. Many people's quality of life has been greatly enhanced by conventional assistive devices like screen readers, hearing aids, and wheelchairs. However, the adaptability and efficiency of these technologies are frequently limited. Recent advances in artificial intelligence (AI) have led to an expansion in the development of assistive gadgets. AI-powered devices offer enhanced functionality through computer vision, natural language processing, and machine learning, enabling more customized and adaptable support (figure 9). By providing more intelligent and responsive assistance to those with disabilities, these technologies have the potential to completely transform accessibility.

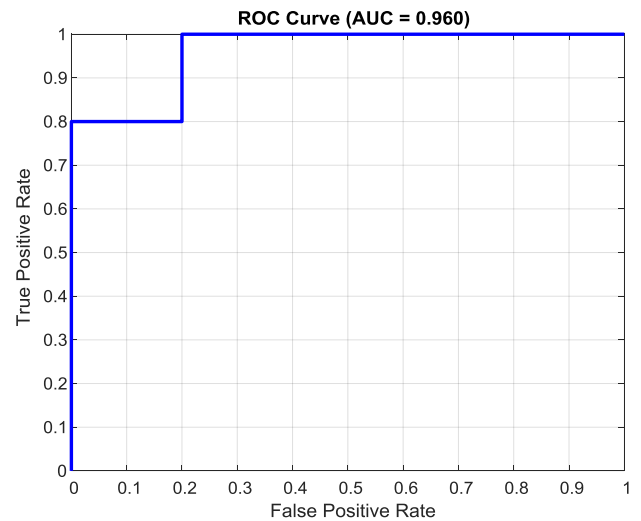


Fig. 9. ROC Curve

The use of AI-powered technologies must complement, not replace, the roles of educators, student agency, and the social aspects of learning in order to guarantee that they foster human flourishing (figure 10).

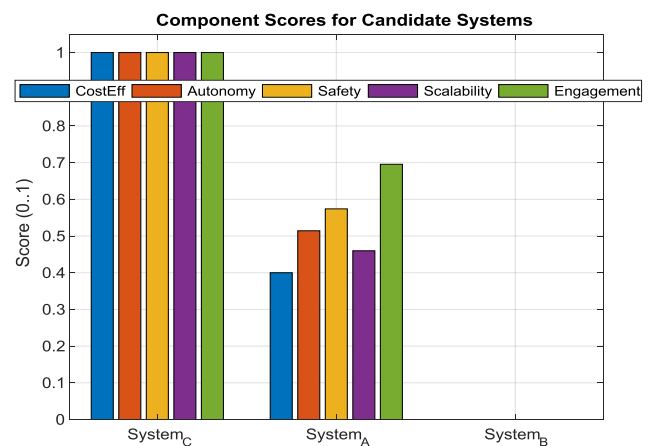


Fig. 10. Component scores for candidate system

AI should be viewed as a support system that offers tailored training, scaffolding, and access while allowing human actors to manage empathy, creativity, and critical thinking in the classroom. The advantages of AI in inclusive education, such as increased autonomy, involvement, and equity, also need to be documented through continued empirical research. Pilot studies and long-term effect analyses should be encouraged in order to identify optimal practices and lower risks.

5. CONCLUSION

This report outlines a number of important avenues for further study and the creation of new policies. Longitudinal research is necessary to understand AI's impact on students' learning, well-being, and digital literacy. It's also crucial to study AI's performance across diverse socioeconomic and cultural contexts to prevent exacerbating existing inequalities. This can help ensure AI benefits all students equitably. Future research should prioritize longitudinal studies to investigate the long-term impact of AI on students with disabilities, focusing on academic performance, digital literacy, and psychological well-being. This can help identify trends, benefits, and potential areas for improvement. Comparative research across diverse socioeconomic and cultural contexts is crucial to ensure AI-driven inclusion benefits all students globally, not just those with more resources. Additionally, studying student perceptions and usage can help tailor the technology to be genuinely empowering and effective. AI-driven assistive technologies can enhance inclusive education by providing tailored support and accommodations, but their effective implementation requires careful consideration of equity, accessibility, and strategic planning to maximize benefits for all students[26]. Involving of AI-driven technologies ensures that these tools are designed to promote social justice and human empowerment in education, rather than just being technological advancements. This inclusive approach can help create more effective and equitable solutions.

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