

# Analysis of AI-enhanced educational tools developed in India for linguistic minorities and disabled people

Shivani Gupta<sup>1</sup>, Monika Gupta<sup>2</sup> & Satinder Bal Gupta<sup>1</sup>

## Abstract

*Artificial Intelligence (AI) is a thriving technology, which is transforming all aspects of our society especially in the education sector. AI in the educational domain helps in improving the learning process by making use of AI tools. In India, different tools have been developed for different purposes. Some AI tools have also been developed for disabled students so that people with disabilities may also gain benefit of location-independent learning. Thus, these tools help to improve the learning of students effectively. In this paper, the authors discussed and analyzed some AI tools developed for the improvement of education by breaking the language barrier among students. The results of the study showed that AI tools help in making high-quality educational content accessible to a wider range of the population. This has led to a more talented workforce, to an improved employability and has contributed to the comprehensive development of the country. The COVID-19 pandemic led to a surge in online education, and AI language translation tools played a crucial role in facilitating multilingual online learning. For instance, during the pandemic, the National Program on Technology Enhanced*

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<sup>1</sup> Department of Computer Science and Engineering, Indira Gandhi University, Meerpur, Rewari, Haryana, India.

<sup>2</sup> Department of Chemistry, Vaish College, Rohtak, Haryana, India.

Correspondence to: Monika Gupta, Associate Professor, Department of Chemistry, Vaish College, Rohtak, Haryana, India. E-mail: [monikabal77@gmail.com](mailto:monikabal77@gmail.com).

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*Learning (NPTEL) in India adopted AI translation tools to translate video lectures into regional languages.*

**Keywords:** Artificial Intelligence; Education tools; Technology; Learning; Linguistic minorities; Disabled people.

## 1. Introduction

Technology has become a vital part of almost every domain of our lives especially in the field of education. Its present use is becoming more and more common with the increased availability of smart and intelligent devices as well as a web-based curriculum. Thanks to its improvements in the educational domain, there are various ways in which Artificial Intelligence (AI) is now being used to make students learn in an effective manner (Limna, Jakwatanatham, Siripipattanakul, Kaewpuang, & Sriboonruang, 2022). AI is replacing human beings in numerous fields, including education. AI is not only used in the teaching of students but also in the writing of essays, grading of papers, to make recommendations regarding the readings suggested to students according to their interests, etc. It helps in enhancing the learning process, in assisting teachers, and in providing the universal access of education to students. According to the report of Global Market Insights, the global market size of Artificial Intelligence in education exceeded US\$ 2 billion in 2021 and is expected to increase at about 45% compound annual growth rate (CAGR) up to 2030 (Wadhvani & Loomba, 2022). By the year 2035, AI is esteemed to have the capacity to add US\$ 1 trillion to the Indian economy (Bhattacharya, 2021). AI has become a powerful driving force, which is transforming the digital world day by day. This is due to an increase in thousands of start-ups, which are popping up like mushrooms, based on AI technology. Various tools have been developed in India that are operated with the help of AI and Machine Learning (ML). AI has entered all sectors including the educational sector. AI tools for the educational sector that are adaptive and encourage personalized learning systems are being deployed in almost all educational institutions to analyze a large amount of data collected from the students that can significantly impact the lives of students and educators. Indian AI language translation tools have played a significant role in transforming education in various ways. Some of the key ways in which these tools have made an impact are the following: a) *Bridging Language Divide*. In a multilingual country like India, language barriers often act as a hindrance to education. The AI tools used for language translation act as a bridge as these tools help in the translation of educational content into various languages, which helps the students from various linguistic backgrounds to gain knowledge in their vernacular language and to improve their comprehension and engagement. b) *Enhanced access to educational content*. The AI language translation tools have allowed the access to educational content by

a large number of people by translating content from the English language into the various regional languages used in India. This has helped the students as well as the teachers, who are not skilled in English or other languages, to qualitatively understand the educational resources available. c) *Access to a comprehensive knowledge*. The AI tools used for translation help the students as well as the educators to make use of a huge amount of educational resources available in various languages from around the globe. This helps them in exploring varied perspectives, in gaining knowledge about various cultures, and in accessing content that was earlier inaccessible because of language barriers. d) *Improved experience in learning*. The AI language translation tools have enhanced the learning experience by enabling the facility of real-time language translations during lectures, discussions, and presentations. This helps students to understand the content of various languages and actively participate in several classroom activities, which help in promoting inclusivity and in providing equal opportunities for all students. e) *Localizing educational content*. The AI tools used for translation have provided the opportunity to localize the educational content, improving the relevancy and accessibility of material to regional students. These tools help in translating textbooks, online courses, and various learning resources into various languages, making sure that students can learn in their regional language, which results in an improved comprehension and engagement. f) *Improved collaboration as well as exchange*. The AI tools used for translation have boosted collaboration as well as exchange among students and teachers from various regions within India. Their use has enabled students to collaborate on several projects, exchange ideas, and gain knowledge from each other, irrespective of their linguistic backgrounds. This enhances the idea of unity in the diversity of the education sector. g) *Improved customization*. The AI translation tools help in customizing specific educational needs as students having learning disabilities can gain benefit from translated content that fulfil their individual needs. This enhances personalized learning and promotes a comprehensive education. h) *Improved accessibility to online education*. The COVID-19 pandemic increased the need of online education and AI language translation tools made education accessible for the students facing language barriers to learn by using online platforms and to get benefit from translated content.

## 2. Literature review

Artificial Intelligence has experienced a continued development since the past few years due to its increasing prevalence in every field. Different AI tools have been developed worldwide for various purposes. In India, various tools have been developed to help the linguistic minorities and people with disabilities. Many researchers have conducted a lot of work in this field, as shown in Table 1.

Table 1 – *Literature review on the AI tools adopted in education*

Reference	Objective	Conclusions
Barua, Vicnesh, Gururajan, Oh, Palmer, Azizan <i>et al.</i> , 2022	To review the adoption of AI technology in teaching as well as learning	The authors concluded that AI technology has both positive and negative effects on education. They concluded that the proper implementation of AI technologies is required to meet the expectations of teachers as well as students
Salas-Pilco, Xiao, & Oshima, 2022	To identify the challenges associated with use of latest technologies in the educational field	The authors reported that the use of AI technologies helped in improving the students' performance and encouraged interest of students in STEM (Science, Technology, Engineering and Mathematics)
Wald, 2021	To assist individuals working in the domain of AI in understanding the different issues related to disabled people and to examine the relation between Personalization and Classification with respect to the involvement of disability	The author concluded that AI technology accommodates the need of both disabled and non-disabled people. The author also identified the challenges faced by AI technology in supporting disabled people
Chaudhry & Kazim, 2022	To present a high-level commercial as well as academic overview of AI in the Educational sector (AIEd)	AIEd is very impactful in reducing the teachers' workload if less workload enables teachers to pay attention to the learning of students, which leads to better learning outcomes
Zdravkova, Krasniqi, Dalipi, & Ferati, 2022	To provide a detailed overview of the effect of AI components on children with special needs	The quick advancement in AI has opened the way in creating new tools to solve communication issues. The various applications and robots using AI help children with autistic disorders who have difficulty in understanding the feelings of others. AI tools allow these children to implement the recognition of feelings as well as of other communal skills

### 3. Popular Artificial Intelligence tools developed in India

India has developed different tools for students to break the language barrier and enhance the learning process and education. Technology is proving to be a blessing for people with disabilities. In fact, specific AI tools have also been developed for disabled students. Some of the most important tools are discussed below.

#### 3.1. Project “Udaan”

This AI tool helps in translating scientific books and books in engineering, which are written in English into other languages to remove the language barrier among students. As has been reported, the translation of textbooks and different learning material can be done in one-sixth of the time it would take when done manually (Gandharv, 2021). This is helpful for students engaged in courses of engineering and technology. This tool makes use of robust optical character recognition (OCR) technology and of editing tools that provide access to bilingual dictionaries in digital machine-readable format. A memorandum of understanding (MoU) has been penned between the Government of Maharashtra and the Indian Institute of Technology (IIT) Bombay on 05th Jan 2023. The main aim of this collaboration is to provide the facility to efficiently and effectively translate all books and journal publications related to vocational education courses in the Marathi language as mentioned in the National Education Policy (NEP) 2020, making use of the “Udaan” project. This project is important since it has widespread implications of incorporating appropriate technology for the welfare of the people (Ganesh, 2023).

#### 3.2. Bhashini

The “Digital India BHASHINI” (BHASHa INterface for India) initiative aims to simplify the use of the internet and digital services in Indian languages, including the access by voice, as well as to support the production of content in these languages. To increase the availability and accessibility of online content in various regional languages used in India, BHASHINI involves the use of a national digital public platform, which could help in building a knowledgeable community where the useful information would be freely available and easily accessible and, thus, enabling the individuals “Atmanirbhar” (self-reliant). Its main aim is to

provide universal access to the content available on the Internet (Bordoloi, 2022). The process of developing a chatbot for Whatsapp is in progress by the Bhashini team. It will use the data from ChatGPT for providing relevant answers to queries. Developing a chatbot covering all Indian languages needs huge datasets comprising numerous local and regional languages spoken in the nation so that a model can be trained. For this purpose, “Bhasha Daan” has been initiated by the government officials for crowdsourcing voice datasets in multiple Indian languages (Pawar, 2023).

### *3.3. AICTE Translation Automation Tool*

It is a unique AI tool that helps in translating English language content into eleven Indian languages, including Hindi, Marathi, Bengali, Telugu, Gujarati, Tamil, Kannada, Malayalam, Assamese, Punjabi and Odia. This tool has the capability to translate book content, difficult formulas, research publications, videos and administrative documents that are written in the English language (Kiran, 2021). This new tool developed by AICTE has helped the Council to translate the 1<sup>st</sup> and 2<sup>nd</sup> year engineering and technological course books in 8 domestic languages, comprising Hindi, Gujarati, Bengali, and Tamil. The translation using this tool needs only 5% of input from humans, and formulae as well as equations can be easily translated. At present, the courses offered by Swayam are being machine translated so that the quality content can be provided to the engineering students, especially to those who belong to underprivileged sections and lack fluency in English, which, in turn, results in a complex of inferiority. The translated content will help them to study with more confidence and to pursue higher education (Ghosh, 2020).

### *3.4. Devnagri*

This AI tool is used for translating web app files and doc files in multiple languages. It is used not only for multilingualism but also for motivating start-ups and developers. It is freely available without any hidden terms and conditions. It offers accurate and reliable translations by making use of machine learning and neural networks with human involvement. It provides translating services in about 22 Indian languages by making use of 5000 translators and provides real-time translation services using the Javascript plugin that has made Devnagri on the Air (DOTA). In the year 2020, Devnagri was chosen to be included in the Special Category – *Natural*

*Language Processing (NLP)*, at RAISE 2020 which is India's greatest competition involving AI-based start-ups in India. This platform combines the effort of human beings and machines to complete the translation process on time and with good quality (Mathew, 2020). The number of clients of the Devangri tool is more than 30 and comprises the UNO (United Nations Organization), C-DAC (Centre for Development of Advanced Computing), PhonePe, Myntra, Snapdeal and others. This tool has been awarded with the "Best Emerging Portal for Translation & Localisation Services 2019". The Devnagri tool also participated in the "11<sup>th</sup> Aegis Graham Bell Award" and won the award in the Artificial Intelligence Innovation category. The tool can easily convert a huge amount of data within a restricted amount of time in several languages by using the latest technology and by lowering the conversion cost per word in Indian as well as international languages (ANI, 2021).

### 3.5. *Read Along*

It is a speech-based reading AI tool developed by the collaboration of SwiftChat with Google. It was developed to help children aged between 5-11 years in reading. The children can use their voice to improve their reading skills. It provides a virtual assistant Diya that helps in guiding children by spotting mistakes in their reading. The (ro)bot allows learners to improve their reading skills by adjusting the difficulty levels at their own pace. This inbuilt assistant provides children with a customized reading journey by providing feedback to improve their reading skills. It supports about 700 stories written in the English language and about 7 Indian languages, including Marathi, Tamil, Telugu, Hindi, Gujarati, Bengali and Urdu. A web version of the Read Along educational app has also been introduced by Google to teach children to read. The website has also included new stories by making adaptations in the videos created by YouTubers, ChuChu TV and USP Studios. Using this web version, the Read Along app can be accessed on larger screens by signing into a web browser using a laptop or a personal computer system at "readalong.google.com". The site can be accessed in browsers, such as Chrome, Edge, and Firefox (Schwartz, 2022).

### 3.6. *EYE-D*

It is an app developed for blind people. This AI tool is helpful in

providing innovative solutions to various problems faced by the visually impaired. It provides them independence in the following areas: identification, navigation and learning. This tool helps blind students to complete their day-to-day activities independently. It provides students with equal opportunities for learning thus making them competent with other students (Team YS, 2022). It collects more than 70,000 visually impaired users spread across more than 160 countries worldwide. The app is helping users in more than 180 cities in India and in about 4,000 cities across the globe. The “Where Am I” facility provided by the app assists the individual in knowing his/her accurate location and provides them with the information regarding important landmarks. The user can choose the landmark he/she wants to visit after changing the mode of the phone to ‘talk back’ mode so as to get the directions from the app. The “Around Me” facility provided by the app assists the individuals in locating hotels, cinema halls, ATM’s, bus stops, banks, restaurants, hospitals, general stores and also the churches placed near them. The search radius can be adjusted in the range of 500 m to 5500 m to find out a specific place. The app has groups of customers in 16 different countries and these groups have begun to work with NGOs in Nepal as well as Bangladesh. In 2018, the app was highlighted as one of the top 10 start-ups which helped this technology to get recognition from various platforms, including NASSCOM and Facebook in the ‘Code for Next Billion’ list (Gogoi, 2019). The team is working on advancing the app by introducing new facilities in the Eye-D Pro app to make sure that visually challenged children may have access to schools and colleges.

### *3.7. Let’s Talk Sign*

It is an AI-powered solution that uses Machine Learning and Deep Learning to help people with hearing or speech impairments. It provides the facility of bi-directional communication between people having hearing problems using sign language and people not using sign language. It supports mobile devices across various platforms having camera and browsing capabilities. It also enables face-to-face communication as well as multi-user online communication. It enables two-way communication without using additional hardware devices, such as the gesture-capturing device, for the purpose of converting sign into text. This app can be used anywhere without needing internet. The gestures can be interpreted in less than 50 milliseconds on a simple smartphone (Malkar, 2022). The deep learning techniques used by this app are embedded in it and, thus, it does not

depend on additional expensive hardware. It provides the facility to interpret dialogue and content to sign and this sign can be imitated by a 3D avatar, which can be demonstrative having facial gestures and body postures. The start-up has made a collaboration with the National Institute of Speech and Hearing to help deaf people (NDM News Network, 2022). The Oracle APAC Start-up Idol 2022, an event where Oracle builds an ethical pattern of innovations by mixing start-up creativity with organization funds to deliver innovative solutions to consumers, has chosen two start-ups to win 3 awards. This start-up won two out of three awards including those assigned to the most creative and the best innovative start-up (Gupta, 2022).

### 3.8. *I-STEM*

I-STEM (Indian Science Technology and Engineering facilities Map) is an AI-based platform and a part of UNICEF's Innovation Fund Investments, which is developed for students having disabilities. It is used for converting visually inaccessible documents into an accessible form for disabled people. Its main aim is to empower students and professionals having disabilities to realize their ability and potential by providing them equal access to various information, resources and opportunities. It is available both as a web service and as an Android app. This portal has simplified school users in India to use the MATLAB software package free of cost, it is hosted on the cloud server of I-STEM and can be accessed from anywhere in India. The I-STEM project has obtained an extension for five years in July 2021 and, thus, has entered in the second phase with new additions. The new phase is aimed at strengthening research and innovations and is designed as a dynamic digital platform. Its special focus is on the under-developed cities. It aims at optimizing the use of R&D resources, encouraging the idea of "Equal Opportunities to All" (Tiwari, 2022). I-STEM organised the Tech Management Conclave 2023 at the Indian Institute of Science (IISc) from Feb. 21 to Feb. 22, 2023 for scientifically inclined women researchers across India. Approximately 150 female researchers participated at the conclave and exchanged their ideas at this platform developed by the I-STEM (TNN, 2023).

### 3.9. *CogniAble*

This AI tool is driven by Machine Learning technology that helps in the premature diagnosis and cure of Autism in children. The staff working in

this organization prepares an individualized learning plan for the child. In addition, regular sessions are provided to children for updates and to help them in enhancing their skills. RAISE 2020 was held for five days during the “Responsible AI for Social Empowerment” online summit. In this summit, PM Narendra Modi announced the name of the start-ups that won the “AatmaNirbhar Bharat AI Start-up Pitch Fest”. This summit was aimed at encouraging innovative AI start-ups developed by Indians. CogniAble was announced as the winner in the education category that uses ML technology for the premature diagnosis of the autism spectrum disorder (Das, 2020). The ZS Prize Healthcare Challenge focuses on incentivizing and promoting the accessibility of the best healthcare technology in India. About 22,000 ideas were submitted in this challenge, out of which 20 healthcare innovation teams were selected at the first step, and further, 8 teams were selected as finalists. CogniAble was one of the three top finalists and received prize money of Rs. 2 lakhs (Pema, 2023).

### *3.10. AttentionKart AI Platform*

It is an AI-based platform designed especially for students with learning problems. It makes use of advanced computer vision technologies, such as facial, emotional and gesture recognition as well as eye gaze tracking, to identify the engagement insights of users. The engagement level of learning students is identified based on behavior, cognitive and emotional engagement. It also takes into consideration the facial actions, head turn around, eye gaze to analyze the engagement level of children. The intelligent dashboards are used to provide the analysis on which the student is learning well. It provides online as well as offline analytics to improve the learning process. A Tracxn score is an exclusive score that depends on the position of a company with respect to the other companies in competition. It stands at the 49<sup>th</sup> position among the active competitors (TracxnAttentionKart, 2023).

### *3.11. Stamura*

About 80 million people are affected by stuttering in the world and this disturbs the social as well as professional life of a person. Stamura provides speech therapy at a very low cost by making use of automation and latest technologies. It provides instructional videos to perform speech therapy exercises, to access the self-help group, to conduct real time analysis as well as real-time consultations by providing speech therapists (News Hook,

2022). Prosus SICA (Social Impact Challenge for Accessibility) helps to identify and provide support to the skilled and talented entrepreneurs who are focused on the development and deployment of latest technology. Stamura has been awarded with the third position in this challenge and with a grant of INR 1,200,000. Beyond the grant, the start-up will receive business development mentoring from the Prosus universe. In addition, the opportunities for collaboration with the public sector and other innovators will be provided so as to make sure that these ideas reach the marketplace (PR Newswire, 2020). Stamura won 1st prize in ZS's healthcare innovation program, which was held in 2021. The app was awarded Rs. 75 lakhs from the ZS PRIZE to develop the app further (ETHealthWorld, 2021).

### 3.12. *Metanoa*

It is an AI-driven platform that provides the facility of the premature detection of various developmental disorders, including Autism, Attention Deficit Hyperactivity Disorder (ADHD), and disability in gaining knowledge, language disorders and delay in speech. It provides various features to detect the disorder, such as a milestone-tracker, activities and goals based on age, tele-video consultation and screening tests for online assessment (Ahmed, 2022). As of 2022, this platform has collected about 18,400 users that are dispersed across its B2B (business to business) and B2C (business to consumer) customers. A Tracxn score is an exclusive score that depends on the position of a company with respect to the other companies in competition. Metanoa's competitors comprise Mom's Belief and Ear2Speech. It stands at the 1st position among the active competitors (TracxnMetanoa, 2023).

## 4. Analysis of the different AI tools

Artificial Intelligence has completely transformed the lives of people by providing them with various tools that help to automate tasks with precision and improved accuracy. AI is making the lives of people easier. In India, many tools and platforms based on AI have been launched that help the linguistic minorities and disabled people. AI technology has made a great impact on the society and is becoming an important part in education. It is helpful in breaking the language barrier among students. The different tools developed in India help the students to understand complex textbooks by translating them into their regional languages. The popular artificial

intelligence tools, such as I-STEM, CogniAble, EYE-D, Bhashini, Devnagri and many more, as described in the previous section, are analyzed in Table 2 based on their advantages and uses.

Table 2 – Analysis of the different artificial intelligence tools

SN	AI Tools	Developed By	Description	Awards/ Recognition	Advantages
Tools developed especially for linguistic minorities					
1	Project “Udaan” (Gandharv, 2021)	Prof. Ganesh Ramakrishnan on 14 <sup>th</sup> September 2021 in IIT Bombay	It was created to help students who were enrolling in higher education institutions to overcome the language barrier	- An MoU was penned between the Government of Maharashtra and IIT Bombay on 5th Jan 2023 with the aim to provide the facility of effectively translating all books and journal publications into the Marathi language as per NEP 2020	- Remove the language barrier among students by translating textbooks in different languages - The target is that 500 engineering textbooks will be translated into Hindi in one year and in other 15 Indian languages in three years
2	Bhashini (Bordoloi, 2022)	Launched by PM Narendra Modi at the inauguration of the Digital India Week, 2022, which took place at Gandhinagar, Gujarat	It was created to encourage citizens to use the Internet in their own language	- Development by the Bhashini team of a chatbot for Whatsapp is in progress. It will use the data from ChatGPT to provide relevant answers to queries	- Help Indian citizens to connect to the digital initiatives of the country in their own regional language - Support different Indian languages, such as Assamese, Bengali, Gujarati, Kannada, Konkani, Punjabi, Odia and others

3	AICTE Translation Automation Tool (Kiran, 2021)	AICTE	It was created to translate English content into Indian languages	- This new tool developed by AICTE has helped the Council to translate books of the 1st year and 2nd year engineering course in eight domestic languages. The translation using this tool needs only 5% of input from humans and the tool is capable also of translating formulae and equations	- Support 11 Indian languages, including Hindi, Marathi, Bengali, Telugu, Gujarati, Tamil, Kannada, Malayalam, Assamese, Punjabi and Odia - Translate English content into 11 Indian languages
4	Devnagri (Mathew, 2020)	Himanshu Sharma and Nakul Kundra in 2018 in Delhi	It is used to translate web app files and doc files in multiple languages	- In the year 2020, Devnagri was chosen to be included in the Special Category “Natural Language Processing (NLP)” at RAISE 2020 - This tool was awarded with the “Best Emerging Portal for Translation & Localisation Services 2019” - The Devnagri tool also participated in the “11 <sup>th</sup> Aegis Graham Bell Award”, and won the award in the AI Innovation category	- Provide translating services in about 22 Indian languages by making use of 5000 translators - Provide 10 times more accurate and efficient results

AI empowered educational tools developed in India

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5	Read Along (Schwartz, 2022)	Conversational AI platform SwiftChat and Google	It is a speech- based reading tool, which is available as an app as well as a website. It helps children to improve their reading skills	- A web version of Read Along educational app was introduced by Google to teach children to read. The website has also included new stories by making adaptations in the videos created by YouTubers, ChuChu TV and USP Studios	- Support seven different Indian languages, including Telugu, Hindi, Gujarati, Marathi, Tamil, Bengali, and Urdu - Improve the reading skills of children
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Tools developed especially for people with disabilities

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6	EYE-D (Team YS, 2022)	Launched in 2016 by Gaurav Mittal, the techie was based at GingerMid Technologies in Bengaluru	It was developed to help the visually impaired people by making it easy for them to perform their daily tasks	- The app has a group of customers in 16 different countries and these groups have begun to work with NGOs in Nepal as well as Bangladesh. In 2018, the app was highlighted as one of the top 10 start- ups, which helped this technology to get recognition from various platforms, including NASSCOM and Facebook in the 'Code for Next Billion' list	- Act as a virtual assistant for blind people - It has about 70000 active users globally in more than 160 countries
7	Let'sTalk Sign (Malkar, 2022)	Indian start-up DeepVisionTech.A I Founder - CEO Jayasudan Munsamy	It was developed to help people having hearing problems	- The Oracle APAC Start-up Idol 2022 chose two start-ups to win 3 awards. This start-up won two out of three awards including the most creative and the best innovative start-up	- Affordable and easy to use - Real-time interpretations - Two-way communication can be done easily

8	I-STEM	A Government of India Initiative, launched by PM Narendra Modi on 107 <sup>th</sup> India Science Congress: 3-7 <sup>th</sup> Jan 2020	It was created to empower students and professionals having disabilities to realize their ability and potential by providing them equal access to various information, resources and opportunities	- This portal has made it easy for the school users in India to make use of the MATLAB software package free of cost as it is hosted on the cloud server of I-STEM and can be accessed from anywhere in India. The I-STEM project has obtained an extension for five years in July 2021 and, thus, it has entered in the second phase with new additions	- Use quick OCR (optical character recognition) features to access printed, handwritten and digital content - Provide the document accessibility feature for converting complex documents into easily usable formats within minutes
9	CogniAble (Das, 2020)	Manu Kohli, Researcher and Scientist from IIT-Delhi	It was developed for the early detection and treatment of Autism in children	- In an online summit (RAISE 2020), CogniAble was announced as the winner in the education category - In the ZS Prize Healthcare Challenge, CogniAble was one of the three top finalists and received prize money of Rs. 2 lakhs	- Provide autistic children with an education plan - Use ML technology to make predictions
10	AttentionKart AI Platform	Niranjan Swamy N, Co-founder	It was designed to improve the learning experience of children by providing them with personalized learning content and by monitoring the engagement of users throughout the journey of learning	- It stands at the 49 <sup>th</sup> position among the active competitors as per Tracxn score	- Use computer vision technology - It offers intelligent analytics by detecting the engagement level of users

11	Stamurai (News Hook, 2022)	Anshul Agarwal, Harsh Tyagi and Meet Singhal, IIT Delhi graduates	Speech therapy app to help people with stammering disorder	- Stamurai was awarded the third position in the Prosus SICA challenge and a grant of INR 1,200,000 - Stamurai won the 1st prize in ZS's healthcare innovation program, which was held in 2021. The app was awarded Rs. 75 lakhs	- Affordable as it costs less than 10% of the traditional therapy costs - It provides high quality speech therapies
12	Metanoa (Ahmed, 2022)	Vibin Varghese	This tool was created to help in identifying developmental disorders, such as Autism and Learning disorder at an early stage, and to provide effective therapies at home	- As of 2022, this platform has about 18,400 users that are dispersed across its B2B and B2C customers - It holds the 1st position among the active competitors based on the Tracxn score	- Provide automated screening tools - Enable parents and caretakers to keep track of the development of children

## 5. Discussion and observations

AI tools, which are discussed in the above section, were developed in India to enhance the level of education for disabled students. These tools have significantly transformed the inclusivity and accessibility of education to students with disabilities. Some AI tools, such as Bhashini and Devnagri, provide the translation of various textbooks written in the English language into regional languages and thus help in breaking the language barrier among students. The content available on the Internet can also be translated in the regional language. Other tools, such as EYE-D, Menatoa and Stamurai, help the disabled students also by providing the learning material in various formats that can be easily used by the visually impaired and deaf students. These tools help in tracking the performance of disabled students while providing effective therapies. This brings a sense of equality among everyone, with or without disability. With AI, disabled people can live independently. Thus, AI influences the daily life of students who belong to

linguistic minorities and those who suffer from disabilities. The tools discussed in the above section were developed in India and these AI language translation tools have played a significant role in the growth of education in India as a developing country as these tools have had a transformative impact on education and on skilling the education initiatives in India. By removing language barriers, these AI tools have assisted in making high-quality educational content accessible to a wider range of the population. This has led to a more talented workforce, to improved employability and has contributed to the comprehensive development of the country. AI language translation tools have made it possible for non-English speakers to use digital platforms and services. This has resulted in the improvement in the adoption and participation of technology in increasing Indian economy. Notwithstanding, it is important to underline that, despite Indian AI language translation tools have transformed education, there are yet many challenges that need to be overcome, which include ensuring error-free translations, preserving cultural implications, and managing technical constraints. However, the impact of the tools discussed in the previous section has been substantial in widening the access to education, in enhancing inclusivity, and in boosting a more varied and enhanced educational ecosystem in India.

## 6. Conclusions

AI technology can be contemplated as a crucial factor that assists in the growth and innovation of several industries including the education sector as well. AI can enhance both teaching and learning. The AI tools, that are discussed in the above section, were developed in India to enhance education. These tools have significantly transformed the inclusivity and accessibility to education for students with disabilities. These tools provide the translation of various learning material and thus break the language barrier among students. They help the disabled students also by providing the learning material in various formats that can be easily used by the visually impaired and deaf students. With the help of AI technology, a sense of equality has been developed among everyone, with or without disability. AI language translation tools have played a pivotal role in India's development as a developing country. They have fostered economic growth, improved education and skilling, enhanced government services, preserved culture, boosted tourism, facilitated global collaborations, and promoted digital inclusion. These tools have helped to overcome linguistic barriers,

opening new opportunities and driving India's progress. The COVID-19 pandemic led to a surge in online education, and AI language translation tools played a crucial role in facilitating multilingual online learning. For instance, during the pandemic, the National Programme on Technology Enhanced Learning (NPTEL) in India adopted AI translation tools to translate video lectures into regional languages. This initiative enabled students across the country to access high-quality educational content in their preferred language, ensuring continuity of learning during challenging times. SWAYAM and AICTE courses are also being translated using the AICTE Automated Translation AI tool. Thus, AI technology and the AI-based tools have proved to be a game changer by influencing the day-to-day life of a person.

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