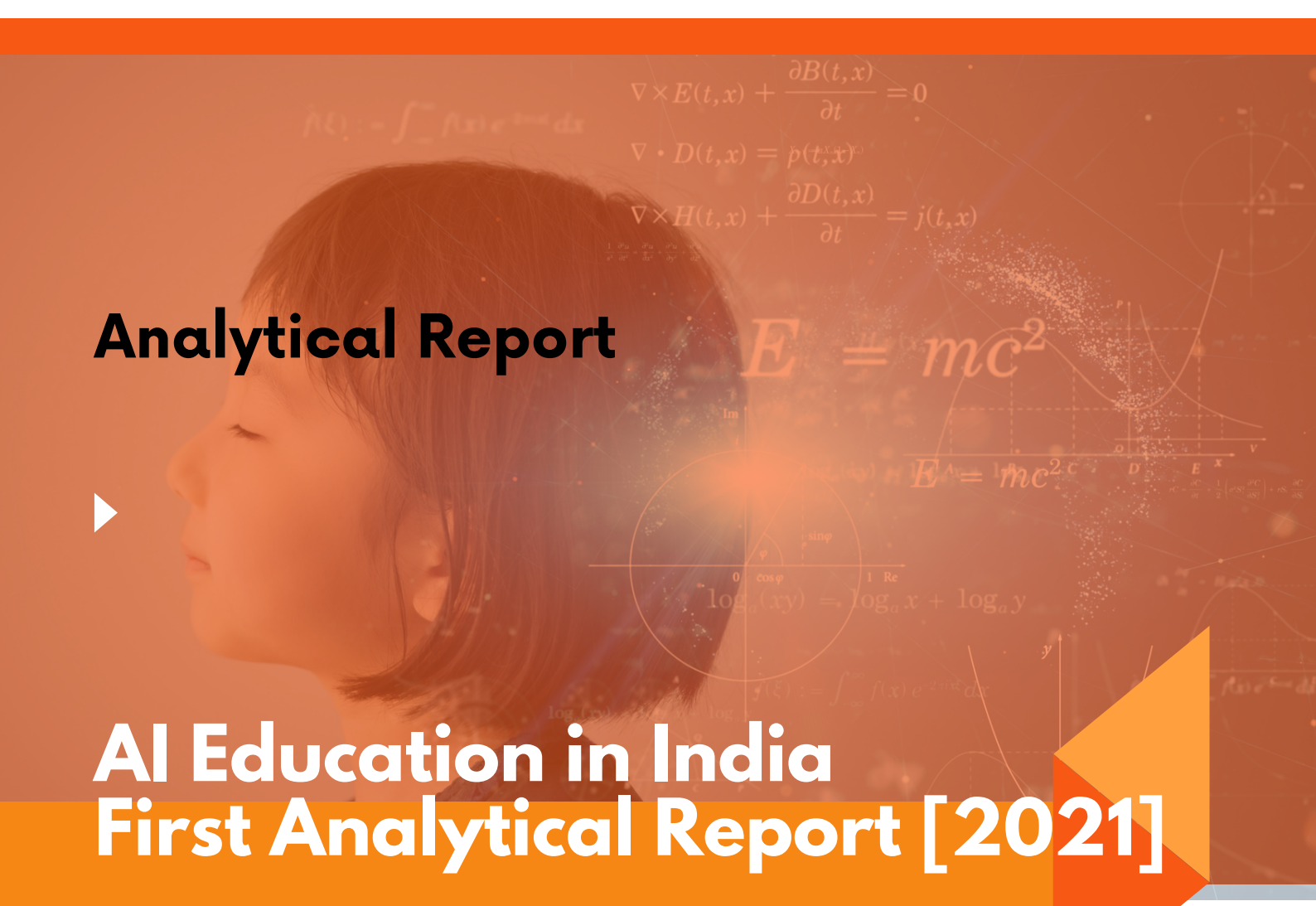

Analytical Report

AI Education in India
First Analytical Report [2021]

Gyanda Kakar
Hemang Arora

THE CIVILIZED AI PROJECT

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INDIAN SOCIETY OF ARTIFICIAL INTELLIGENCE & LAW

AI Education in India

First Analytical Report

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Indian Society of Artificial Intelligence & Law

Synopsis. This is the First Analytical Report on the State of AI Education in India with recommendations and conclusions under the Strategic and Civilized AI Programme.

Introduction

Youth in every country is the largest and most promising part of the population. As a country that has the world's highest youth population, India has the benefit of being a global leader compared to other nations, because we efficiently harness youth talent. (Arora, 2020) Quality education is the only way to do this. With the increasing scope of artificial intelligence in India, it is time to introduce AI in education, to benefit and make young people AI ready for the future. Since the education sector has a link with complex, informationally controlled business environments, recent developments in technology and the growing rate of adoption of AI technologies make it important for issues concerning implementation within the education sector to be recognized and evaluated. (Ketamo)

AI technology in India has the capacity to automate both complex and worldly activities that in turn can lead to optimum use of human capital, allowing them to focus on areas where their overall productivity is greatly enhanced. (Arora, 2020)

As mentioned at the outset, youth is the biggest part of any country's population and quality education plays an important role in helping the country to achieve a better future. With a growing number of artificial intelligence services in India, the education sector must update its strategies by taking into account the effect of AI on education in India and how it can help young minds today becoming tomorrow's capable leaders and innovators. (Arora, 2020)

The recently launched SDG Index 2019-2020 by Niti Aayog assigned a composite score of 58 to India under the SDG on Quality Education, with only 12 states/UTs having a score of more than 64. The government's actual education expenses are below 3 per cent of GDP, while in primary school pupil-teacher ratios are below 24:1, which is considerably lower than comparable countries such as Brazil and China. It will also not be possible to meet teachers' demand due to the increasingly growing population and declining resources. (Arora, 2020)

In the academic world, artificial intelligence has already taken a long step forward, transforming the conventional methods of information transmission into a complex system of simulation and Augmented Reality (AR) instruments. Interactive research materials comprising text and media files can very easily be exchanged between interest groups and can be used with the aid of intelligent devices in a more efficient way. (Stempedia, 2020)

In education, there are vast and complex benefits to the use of artificial intelligence. Everything here can be considered helpful, for instance, if we think about something that can perform efficiently any tasks usually rely on human intelligence, such as a computer program. Based on the state-of-the-art research in this field, we identify nine areas in which AI approaches can add value for learning and teaching. (Dharmadikari, 2020)

In this report, we argue that in educational and learning contexts, the function and effect of artificial intelligence is increased. In academia, on the one hand, the context of intensity (multi-cultural) and asynchronous is becoming more powerful and individual. The intersection of three fields, namely data, computing and education, has dramatically affected the essence of telecommunication: what is being learned, when it is taught, how.

Following are the questions, which have been addressed through this report.

- How Education has or should be democratized in India through AI under its SOTP classification?
- How human privity and autonomy is preserved from the interference of AI?
- How sensitive data/information is pseudonymized and kept in presence?
- How pedagogy standards should be translated into AI?
- How should the cultural aspects of technology be interpreted to ensure non-interventionist ed-tech ethics?

How Education has or should be democratized in India through AI under its SOTP classification?

In India, currently there exists no particular legislation on protection of personal data like GDPR or the Data Protection Directive. (Talwar Thakore & Associates, 2020) However, the Information Technology Act (2000) include Section 43A and 72A which allow a right to compensation in case of improper disclosure of personal information. The term 'Pseudonymization', refers to the process wherein that requires the source collecting data to process it in such a way so as that the personal information is no longer identifiable to a certain natural person. (Thales) The only way in which this pseudonymized data can be linked to back to an identifiable to a specific data source is through combining other pieces of information which is protected individually in different parts. (TREND Micro)

The Committee of Experts under the Chairmanship of Justice B.N. Srikrishna recommended the technique of 'Pseudonymization' under the term 'De-identification' in the Personal Data Protection Bill, 2020. (Justice B.N. Srikrishna, 2018) It also goes on to specify that this de-identified data shall also be treated as personal information and thus be inflicted to the same standards. The National Education Policy, 2020 has emphasized on the use of AI in education. (Mehra, 2020) But, as the authors of this report have gone through many AI-EdTech Start-ups especially those which have been supported or awarded by the Central/State government under various programs promoting AI education, it is hard to find any organisation which explicitly explains how the collected data shall be processed. Moreover, only a few websites explicitly mentioned that the data collected and that it won't be shared with third parties, but had no mention of how it will be used by the parent company and what procedure is being followed so as to keep it safe.

The objective behind the process of 'pseudonymization' is to ensure that organisations processing that personal data implement enough measures so as to keep this information safe.

The question to be answered is that how is data pseudonymized in the AI EdTech sector in India, but as mentioned before unlike jurisdictions like the EU there exists no specific legislation like GDPR that mandates this process in India. (Shubham Singh, 2020) Thus, no mention of this term could be found on websites of most of these AI-EdTech start-ups. We need to look into what all personal data can be collected by such organisations and whether they are using pseudonymization so as to secure subject personal data. (Deloitte, 2019) We will be looking into different organisations in the filed and analyse the information collected by them. However, before looking into the practices followed by several players in the AI-EdTech sector it becomes essential to understand what data can be collected. This although can be listed according to the practice followed by each firm but it varies a lot from firm to firm so it would be better to list all the ways in which information can be collected. It starts with basics like understanding conceptual clarity based on the responses of each student and then progressing forward so as to strengthen the weak-concepts. It can also be as advanced as tracking the emotions through facial tracking so as to understand a student's interest, understanding, clarity etc. Thus, it can vary exponentially and be based on several parameters like solve-rate, attendance etc. Now, looking into a few AI-EdTech organisations in India:

- Analytix Labs (AnalytixLabs) this organisation is a start-up by several MIT, ex-McKinsey graduates which offers courses using big-data to enhance the process of field switching. For example, if a law graduate at the age of 30 wishes to switch to a job in the field of Big-data analysis then they can choose a course and after completing it they shall be well versed with knowledge about that particular field. This firm is based in Gurugram, Haryana in India and its services are currently being used by a large number of individuals and organisations. Moving on to the privacy section on its website, it says that all personal data collected is safe and secure, and subject to best practices in the field for ensuring the same. Section-6 of their privacy policy states that 'To protect your personal information, we take reasonable precautions and follow industry best practices to make sure it is not inappropriately lost, misused, accessed, disclosed, altered or destroyed.' However, it should be noted that there is no mention of how and which processes are used to ensure the same.

- Deepgrade (Smartail) is a firm in India offering its services in the field of AI Education, to figure out whether it uses or plans to use pseudonymization for data processing their FAQ section needs to be looked at. Under the privacy sub-section, merely two questions related to privacy have been answered, first whether personal data is safe with Deepgrade and whether data is shared with any third-party. The website states that it uses AWS services which means that all data stored is under S3 encryption and thus, it is very secure. And with regards to the latter, it states that they offer no personal information to third-parties. The S3 storage offered by Amazon in AWS although GDPR compliant (which mandates pseudonymization) but it is limited only to jurisdictions where is GDPR is in force. (2020) Thus, in coherence with the practice followed by most of the firms in India collecting personal information for Artificial Intelligence no particular method has been mentioned, stating how this information will be kept safe.

- Embibe (Embibe) it is among the most subscribed AI EdTech services in India, it has also won several awards like 'Amazon Award for the best AI for the education sector'. Although, under the terms and conditions of the services offered data privacy has been mentioned, it only states that all data shall remain secure and it shall be subject to laws applicable in India. Considering, in India no legislation like GDPR is applicable yet it is very difficult to know whether practices like 'Pseudonymization' are followed by the firm despite and explicit requirement under present laws in India.

Thus, it becomes very clear that unless and until proper rules and regulations regarding 'Pseudonymization' are implemented in India it will be a rare occasion to see firms follow such practices. Moreover, it can also be seen that as of now such organisations doing very less so as to focus on data privacy which unfortunately, means that most of the consumers have other priorities while choosing such courses offered. It also becomes clear that a Personal Data Protection Bill needs to immediately be put in place as if this information if leaked into the wrong hands can be misused for several purposes, violating the right to privacy enshrined under the Constitution of India.

How human privity and autonomy is preserved from the interference of AI?

Many look to AI-powered tools to solve the need to scale high-quality education and with good reason. An increase in educational content from online courses, increased access to digital devices, and the contemporary revival in AI seem to provide the pieces required to offer personalized learning at scale. However, technology has a poor track record for addressing social problems without causing unintended damage. (The Impact of Artificial Intelligence on Learning, Teaching, and Education, 2018)

For decades, AI has been designing an autonomous tutor in the sacred grail of education: an algorithm which can monitor the progress of students, understand what they know and what drives them and provide an optimal adaptive learning experience. Students can learn from home anywhere in the world with access to an autonomous tutor. But 2020 self-employed tutors look very different from this ideal. Self-tutor education typically includes students with problems that are easy to interpret for the algorithm—as compared to the learner's joy. (Garcia, 2019)

Current algorithms are incapable of understanding and far from generating long-term learning advantages, rather than concentrating on short-term students. The technological challenges are immense. It may be as difficult to develop the perfect auto-tutor as to achieve true AI. Students attend school for many other causes, including socio-emotional skills growth, human mentoring, and human culture. The displacement of these institutions costs all the possible shortcomings of human teachers and the existing classes. Many of us recall learning from teachers who were responsible for mentoring and teaching well beyond the subject. (Chris Piech, 2020)

In addition, isolation is increasing, younger generations being lonely than older generations. One study showed a correlation between depression in teens and time screen compared to young people who spent time on offscreen activities such as social interactions in person, sports or homework. Reduced screen time can lead to significant empathy gains. (Chris Piech, 2020)

UNESCO's mandate calls inherently for a human-centred approach to AI. It aims to shift the discussion to include AI's position in addressing existing disparities surrounding access to information, research and the diversity of cultural expressions and to ensure AI does not expand the technological gaps within and between countries. The promise of "AI for all," in particular in terms of innovation and awareness, must be that each individual will benefit from the new technological revolution under way and access its fruit. (UNESCO, 2020)

Since UNESCO considers the creation of socio-emotional competences to allow peaceful and sustainable societies as reorientation goals of the education sector, compelling children towards the screen can undermine those goals. In the meantime, the AI disturbance in the classroom could spread to homes and communities. Regardless of how much "humanity" such technologies exhibit, authority figures such as teachers and parents may not easily adapt to a curriculum entirely carried on a digital device. In traditional poor communities, where some see the greatest potential effect of AI technology, this resistance may be harshest as families who don't accommodate children who spend time on screens can avoid changing their mentored work to AI tutors. (UNESCO, 2019)

We must also recognize the likelihood of newly effective and inspiring educational instruments being used by evil actors to teach violent subjects. Much as the increase in Facebook improved both destructive and democratic organization, new effective teaching tools could assist terrorists in developing training on destructive actions. In addition to the objective of building human empathy in AI tutors, deep personal data on emotional and psychological circumstances of learners will be processed. Can authoritarian regimes use psychological data for people from the time of repression or power accumulation by schoolchildren? (Chris Piech, 2020)

While researchers support the ability of AI-enabled education resources to democratize education globally, they have to look at how these instruments can sustain or increase inequality. The source of trained data on current AI algorithms becomes privileged groups having access to digital resources. When machine learning algorithms train on such datasets – maybe a group with over-represented white students from the US – the result could be biased towards groups from other backgrounds and therefore inefficient or even discriminatory if it is used in a different group. (Chris Piech, 2020)

When AI aims at young learners who do not yet agree to the collection of their personal data and at learners in higher need, who do not understand the risk of sharing their personal data or communicating online with anonymous foreigners, the challenge is how to use vast quantities of personal data for personal learning while preserving their personal privacy and preferences. Platforms connecting educators around the world are no utopian way to moderate online experiences. (Chris Piech, 2020)

- Facilitate more human learning interactions: Instead of replacing teachers, AI could be built to help educators and educational systems by automating activities and creating exciting issues. Teachers and tools can work together: teachers filter valuable proposals from AIs and tools that help teachers in graduation and student tracking.

- Inspiring problems:
    - AI may also contribute to the development and dissemination of local problems. This synthesis could create a rich teaching and learning environment, supported not replaced by technology through social and emotional interactions.

    - Inspiring, open-ended work offers discovery and innovation opportunities. However, existing methodologies involve data sets of a large number of students, so that accurate, AI-led input on open-ended work is possible. AI should help the teachers if these questions are to provide feedback on them.

- Risk Detection for Child Safety: In order to ensure that online learning spaces are secure for all learners, particularly children or those in vulnerable contexts, a good amount of energy should be put in developing content moderator tools.

IIT Bombay-AI Proctored 'Invigilator' and Privity Concerns [Case Study]

A proposal at IIT-Bombay to build an AI model (artificial intelligence) for automated student protocols raised concerns among several faculties that claimed the institute was nodded to the use of captured student videos without student agreement. Currently, IIT-B Faculty monitors remote proctor tests that require students to sit in full view in front of the camera. AI proctoring would automatically identify cheating cases during examinations. When students received a long collection of instructions on how to proceed, nobody said that they sign up to allow their videos for postprocessing. At the time the email was drawn up for students, there was a plan to work on this kind of initiative. Those undertaking this project assured the Ethics Committee that the purpose of the study is being prevented if consent is taken. (Goradia, 2020)

Possible solutions are provided by Tharun Komari. Students with high test anxiety perform poorer in a proctored online setting, according to Woldeab and Brothen's study. Students and colleges face a dilemma: data protection and cheating prevention. The development of this tool has shown us that, whatever the solution we introduce, it must not unintentionally impact our students by violating their right to privacy but must also be effective enough to prevent students from outsmarting them. During the test, his model prevented students from visiting social media sites, and some students fooled the system using their mobile telephones. The model was nevertheless high in accuracy and was more efficient and privacy-friendly in general. With the growth of online training, there is no perfect way to cheat online and the use of AI is just one way. (Komari)

The main factor behind this project is perhaps that a behavioural approach is perhaps the best way to avoid surveillance tactics being broadly used in online learning. The universities should also reassess how they measure the knowledge of students.

How pedagogy standards should be translated into AI?

Pedagogy, is the study of approaches for education, including education objectives and approaches to achieve these goals. It is the art, science or profession of teaching. The area relies heavily on educational psychology, which includes science-based hypotheses and, to a certain degree, educational theory that takes the goals and meaning of education from a philosophical point of view. (Peel, 1998)

5 principles of effective pedagogy

The teachers use pedagogical techniques while they are in the classroom. The activity of providing successful pedagogy typically depends on the particular subject to be taught, the identification of the varied needs of the students and the adaptation of the conditions around the classroom. (Nisai Learning, 2019)

The five principles of pedagogy include joint productive action (JPA), language and literacy development (LD), meaning making (MM), complex thinking (CT), and instructional conversation (IC). (Nisai Learning, 2019) These standards are based on realistic principles that have proved popular over a number of decades in teaching and learning environments with a majority and minority at-risk students. For each standard indicators are implemented that show action components of the standards and their teaching and learning functions. (West Leederville Primary School)

In order to support the universality argument for such standards, illustrations and examples representing standards and their measures in the majority and minority at-risk student classrooms are seen in various classroom settings. The aim is to call for standard-based reforms to represent their own suggestion that pedagogy should be fundamental to the achievement of all student learning.

Successful learning has become an increasingly effective way of enhancing classrooms, achieving national education objectives and making sure all students succeed. The new reform movement continues the mistake of previous decades, failing to analyze how standard statements react to the main teacher issue—how students can understand what they are supposed to know.

Reports show that the concepts of pedagogy and their relation to philosophy of education and learning are often lacking and rarely modelled within the spectrum of the production of teachers, from service to inservice. (Arora, 2020)

Statistics show that one-quarter of newly recruited teachers were unprepared during 1991 to provide successful training in rural and urban isolated schools serving minority at danger. Learners report that their professional development is usually consistent with changed objectives, but their opportunities for nuanced skill building are hindered by the excessive number of topics and the confounding range of the trainers. National policy surveys and case studies reveal that efforts are likely to be desultory rather than systematically or centred when school-based reform is aimed at improving education. (Preetipadma, 2020)

Teaching and pedagogy means more than ever that teachers continue to assist students in the ongoing social activities in classrooms through their engagement and movement. For instance, all exchanges between teachers and their students in oral language developments under girds not only in lessons. Pedagogy also ensures teachers can understand how to use the local awareness funds for academic learning to learn about student homes and neighbourhoods. Today pedagogy applies research principles and findings that are promising to achieve all students, for example, learning groups, linguistic development, directed engagement, emerging literacy, information funds, cultural compatibility and educational dialogues. (S. Amershi, 2005)

Real-time text to speech and text translation systems [Case Study]

In accordance with the National Education Policy 2019 Draft, real-time text to speech and text translation systems can be used for seamlessly disseminating knowledge in the regional language, which has fostered the learning of mother-tongue. DISKHA, the digital knowledge sharing infrastructure, that MHRD has set up or e-PATHSHALA will incorporate these translation systems (initiatives under the Sarva Shiksha Abhiyaan). For example, if an E-PATHSHALA textbook is only available in Hindi, it can be available in other regional languages and made accessible by text translation services.

The language barrier can be eliminated and the interoperability of teachers in the states is achieved through this language translation system which helps meet the demand better than ever. (Arora, 2020)

ATL-AI Step-up Model [Case Study]

The basis module was designed specifically to consider students younger than 12 years old who did not have an AI background to allow them to enhance their curiosity about AI and to contribute to an innovation ecosystem. The step-up Module was planned and submitted to involve young people throughout the country in the promotion of inclusive learning and in the development of integrated AI technologies among the young. These modules will allow youth to meaningfully engage with AI-based technologies and enhance learning through digital literacy, coding, and machine thinking. Competencies such as logic, critical thinking and problem solving would be in-demand in the coming decades. These modules will allow young people to engage meaningfully with AI-based technology and improve learning by incorporating digital literacy, coding and computational thought. Competences such as rational reasoning, critical thought and problem-solving would be the most significant competencies for success in the next decade. (Dharmaraj, 2020)

Vishakhapatnam, Andhra Pradesh-17 Districts-Finding out the Loophole [Case Study]

In 17 districts, the government of Andhra Pradesh conducted an experiment. A Machine Learning Technology framework collected and analyzed student data concerning different dynamics, such as academic success, the cause of school drops, teachers' qualities and skills, culture, gender etc. This application has found predictive trends including likely students dropping out. A list of thousands of students who will leave schools in the 2018-2019 academic year has been purchased by the state government. These studies demonstrate that AI works as a catalyst to streamline the education system and enable organizations to make informed decisions. (Dharmadikari, 2020)

Automated Grading [Case Study]

The draft 2019 national education policy prioritizing online learning could be used for automated grading on large- scale tests on platforms such as DIKSHA, E-PATHSHALA and SWAYAM - not only objective but also subjective - by engineering methods such as natural language processing. Automated content development is another area where AI can participate, as NLP can make use of Automatic Text Summarization in order to create crisp content and publish it on these e-learning sites provided broad sources of internet knowledge. This uniform unified curriculum, which is built with ML-based methods, will be consistent with nationally established learning findings (MHRD has developed the Performance Grading Index (PGI) 70 indicator-based matrix for states and UTs) and will critically assist in determining indicators for the percentage of students at a minimum level of competence. (Arora, 2020)

Supervised classification models to reduce drop-out rates [Case Study]

With personalised input from AI programs, we can curb the drop-out rates in all of India, which rise to 4% in the primary level but up to 20% in higher education. As individual tutors continue to gather data points every moment of the journey through the child's education, classification ML models can be used to forecast the likelihood of children leaving and proper remedial mechanisms may be introduced. Such a completion will contribute to an enrolment level for higher education and ensure that a substantial proportion of adult education reach mandates in line with the SDG's objectives. (Arora, 2020) (Stempedia, 2020)

AI in Adaptive Learning (Li, 2020) [Case Study]

AI is a vital element in adaptive training thanks to smart tutoring programs like Mastery learning and Carnegie Learning. Carnegie Learning provides individualized tuition and real-time input to post-secondary students through the use of cognitive science and AI technologies. Mastery Learning, through incorporating curricula around a student's success and combining timely, tailored input, immediate opportunities for correct practice and improvement activities, promotes the efficacy of individualized training in the school.

Pattern Detection to increase Inclusiveness [Case Study]

The use of AI will positively impact on the goals of reducing gender differences in education and the integration of people with disabilities, which not only enables visual impaired users to be more participatory but also allowing mute people to be heard in almost real-time texts in language systems, which make the use of AI more inclusive.

For supporting Inclusive Education for Children with Special Needs Children under the Samagra Shiksha program of MHRD, children affected with disorders that results in a speech disorder could benefit by integration of machine learning models in the e-learning websites that detect speech patterns, augment the speech by correcting mispronunciations or broken words and then output the same in an audio or a text format. Moreover, some education institutions in the present system may, consciously or otherwise, have inherent implicit prejudice, for instance, in the election of more students with policies that prevent the equal opportunities of certain indigenous groups. Selection criteria for employment, for example, can include the monitoring of certain AI processes in order to ensure that the process is a fair one and is a precursor to inclusive education. (Arora, 2020)

PictoBloxAI [Example]

India's first immersive IT training platform, PictoBlox AI, is a complete project-based learning environment with its integrated graphical programming interface artificial intelligence and machine-learning software. (Stempedia, 2020)

Personalization of Content [Case Study]

If such material is contained on these e-learning sites, individual reviews and suggestions may be possible to a wide range: At present, no individual consideration can be provided to each student. However, the development and grading of content by AI will ensure that children have customized pathways to study by recognizing pain points for their students and making suggestions accordingly. Essentially, AI-powered education infrastructure will offer a personalized tutor to every student in India. The Cram101 that uses AI to disseminate and break down content of textbooks into a comprehensive study guide is an example of such mechanisms, which makes browsing the chapter, flashcards and realistic test summaries easier. Netex Learning is also a useful AI interface. It allows educators to device-wide digital curricula and materials, incorporate rich media such as audio and video, as well as evaluate themselves or teachers online. JustTheFacts101 has a similar design that highlights and creates text-specific summaries, which are then archived and made available in a digital collection on Amazon. Several companies including Content Technologies Inc. and Carnegie Learning are currently creating smart teaching design and interactive tools using IT to provide pre-K students with learning, testing and feedback. (Arora, 2020) AI is a vital element in adaptive training thanks to smart tutoring programs like Mastery learning and Carnegie Learning. Carnegie Learning provides individualized tuition and real-time input to post-secondary students through the use of cognitive science and AI technologies. Mastery Learning, through incorporating curricula around a student's success and combining timely, tailored input, immediate opportunities for correct practice and improvement activities, promotes the efficacy of individualized training in the school. (Dharmadikari, 2020) EduGorilla is another company that uses AI to analyse Big Data in the education industry in India. It analyses data from 600,000 schools and 70,000 plus coaching centres to provide top quality results for students. This acts as a one-stop shop for all things education-based in India. Students can rely on this platform only. (Velayanikal, 2020)

Biometric authentication-Monitoring Education [Case Study]

AI will take over the teacher's ordinary and administrative tasks - . For example, the implementation and incorporation of UDISE+ (Unified District Information System for Education) is possible for biometric authentication for students – an application that is one of the largest school education management information systems. The biometric attendance data may also be used as a proxy for district / state/ block inclusiveness and can easily be monitored to support the monitoring of national indicators such as youth and adult participation rates and proportion of men and women enrolled in higher education, technical and professional training. An example is Presentation Translator, a free PowerPoint plug-in, which provides subtitles to what the instructor is saying in real time. In addition, Azure Cognitive Services helps students to hear or read what is said in their own native language, thanks to AI speech recognition and translation. Well, the above cases offered opportunities to students who cannot attend school due to sickness, who need to study at a different stage, or who are not in a school or do not understand the language of others. (Arora, 2020)

In education, evidence-based training (EBP), where the need to provide teachers with a capacity to autonomously produce proofs of their best practices in situ is increasingly stressed. Such contextualized evidence is seen as the key to informing education. One of the main problems of EBP is the lack of methods for teachers to provide proof of their practice at a low level of detail in a way that is inspectable and reproducible by others. (AI in Education as a methodology for enabling educational evidence-based practice, 2016)

In order to contribute to education, learning aid must provide simple and definite pedagogical advantages over conventional methods of learning. In such a way it is critical that it supports these different skills and learning styles to meet a broad range of students who might have a classroom. (Arora, 2020)

Increase student awareness of the domain objective. In the AI domain, this encompasses both the abstract information maps to graphical representations and the different AI algorithms based on these maps. Differences between individuals Theory indicates that visualization tools can affect learners differently in accordance with their various skills and styles of learning. Different students may demonstrate a different degree of preference for a visualization method, or may experience different levels of betterment. In addition, the knowledge of a subject will change with time and with different rates of each student. A tool should also take into account the individual speed of learning and encourage beginners, but still continue to facilitate learning as the learner awareness grows. (AI in Education as a methodology for enabling educational evidence-based practice, 2016)

Many works on visualization tools have been aimed at calculating learning gains to demonstrate performance. However, findings from these studies remain mixed, unlike educators' intuition that visualization of algorithms is pedagogically advantageous. Alternatively, findings of preliminary research on other factors, such as the ability of a tool to stimulate student motivation and indirectly boost learning results seem encouraging. (AI in Education as a methodology for enabling educational evidence-based practice, 2016)

The active involvement of students in the study process is one way to encourage students to learn. This can be accomplished by promoting the interactions between the student and the tool within the framework of visualization software. Active participation not only improves motivation but significantly enables students to consciously build awareness and new insight on the pedagogical impact of a visualized method.

Many educators understand the potential advantage of using visualizations for classroom presentations, but using visualizations for courses such as tasks or individual explorations can contribute to higher levels of involvement. In this activity, students will actively participate by answering questions about visuals or underlying principles, modifying the input of algorithms, evaluating associated behaviour changes or creating new visualizations.

These activities should be more active than passive activities, such as watching class visualizations, because students need more effort. The use of visualization software will improve the educational benefits of the tools in all the learning activities.

AI methods, which are used as a means of generating and computerizing teaching and learning knowledge, provide the resources necessary for teachers to systematically, detailing and incrementally collect information, and can also be exchanged and examined by others. The analytical consideration of AI's contribution to educational affairs provides an important prospect of the potential role AI has played in education.

Representation of knowledge (KR) is central to AI and, perhaps, to any scientific endeavour, for it is an instrument of conceptual explanation and reasoning of the world we live in at its most basic (and general). Scientific theories are basically ways of describing knowledge of the universe, although at various levels. In AI, the representation of information is necessarily an intelligence theory, or more specifically, intelligent reasoning, by definition.

Elicitation of knowledge (KE) is an inseparable complement to the portrayal of knowledge by focusing on the universe through KE. KE means that we can participate alone or as respondents to query of someone else, either collaboratively, and the process can be formal, informal, organized or unstructured. KE is a process that involves ourselves or others. In the sense of AIEd, different types of KE instruments have been adopted, produced and tested. For example, questionnaires or interviews have been borrowed directly from social sciences, whereas approaches such as cognitive improvements in power and applicability have been acquired with AV.

By applying AI as a methodology to promote educational practice based on facts, the partnership between AIEd and education can be improved. AI provides educators with basic tools that can be inspected and repeated by the larger educational group in order to provide proof of their activities. Knowledge collection and representation methods by AI will enable practitioners to participate in computer design thinking, which can create independence for practitioners when identifying, designing and inspecting their real-world practices at a low representation level.

In the cognitive age, AI brings education. In the educational environment and through learning, new levels of personalization are being transformed. Cognitive tools which now allow educators to understand, learn, and explain the styles and preferences of individual students to spread all levels of learning skills. The outcomes are holistic pathways over the lifetime of each learner.

The functioning of a democratic society is determined by education. The need for and value of a quality public education system has been changed by every great political thinker, for this form of system ensures that the people of a society are sufficiently prepared to make decisions in a democratic political system that favour society as a whole rather than themselves.

A quality public education system should ensure the development of key competences, such as critical thinking, judgment and citizenship, during education, that children and adults grow and contribute to their development in a democratic society.

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Young people in their lives are especially malevolent at this age and educational stuff can really put them on a particular track. We see AI instruments which can take a great deal of knowledge on career paths and suggest what students can learn. So, we have AI informing young people's decisions. Ethical effects are more live and quickly acquired for cases like this. We trust a lot in technology designers' skills, who often have a limited understanding of pedagogy or how universities or classrooms work. We trust them to create a tool that is parachuted into an educational setting.

It is crucial to understand the current and historical attempts to use edtech to automate and automate education. This understanding will provide administrators and clinicians with insights into the types of policies and activities supported by edtech. Such technologies are seldom impartial and understanding their preference – particularly their preference for packaging and automated delivery of education – can lead us to ask important questions as to their objectives and consequences.

The Edtech programmes should promote an appreciation of their ideological, social, political and economic backgrounds. Although edtech initiatives must keep people informed for the design, creation, evaluation, implementation and management of edtech and related educational practices, we cannot forget that this technology is not impartial, either political or ideological.

Organizations should cooperate in the development of edtech. In order to carry out independent testing, assessment or training criticisms of products based on their experience and expertise, for example, researchers may collaborate with edtech companies. Persons working in edtech companies should take action to close the gap between their practice and current research in edtech.

Outcome Analysis

In less Internet-friendly societies, each site experiences different forms of child abuse, and exploitation is likely to be intensified. Researchers must take responsibility for the safety of potential users of online tools against malware experts to use even the best-sophisticated users in order to fulfil the pledge of online education to help the least developed countries.

Initiatives like the ATL AI-Base Module of the Atal Innovation Mission, the planet code, launch of INDIAai as the centrepiece for all AI in India and beyond, and CBSE's efforts to introduce AI in schools are some of the numerous commendable measures towards the implementation of AI training in India and preparation for the future of youth in India. Artificial intelligence will also play a large part in the achievement of the country's targets for 2030 in line with United Nations Sustainable Development Goals. One of these goals is to increase the number of eligible professors significantly.

AI promotes advanced techniques to support the education sector which make students and teachers simple, engaging and productive learning. The increasing compatibility between human and artificial intelligence helps society to make the most of the educational system without incurring unnecessary cost of service. All changed to personal tastes in this period of personalization, be it recommendations from Netflix or Facebook advertising. AI empowers educators right from the outset of a semester to meet the unique needs of all students. This gives an instructor plenty of time to help his students improve cognitive skills. (Dharmadikari, 2020)

AI in education can help boost our teachers' effectiveness through various AI applications, such as the automation of mundane and repetitive, routine work such as attendance, the automation of graduation, the personalization of learning journeys, based on knowledge, skill and comprehension, etc.

AI has allowed classification automation and document processing. These activities must no longer be performed manually by teachers and administrators. In reality, AI will create more effective registration and admission processes in the coming years.

AI solutions might include some services at a time when many educational institutions are extended beyond their capacity and learners are waiting long for local therapy. It is therefore advisable, in the interests of improving the education quality and minimizing errors in the dissemination of the administrative documents and in studying, that organizations use solutions which are assisted by the latest technologies.

Conclusions and Recommendations

The education sector in India has opened many avenues for AI involvement and will continue to open these avenues. It could be a tough route for the country to meet the quality education goals under the SDG without using this superpower, which is often thought to be the new power for the 21st century. A bottom-up approach is required - the SDGs must be located at the grass root stage. In the last decade, in order to achieve the UN objectives, it is necessary to encourage progress towards these objectives and to follow up the UN indicators on a real-time basis would be an important step towards achieving these objectives. (Arora, 2020)

The 'Transforming aspirational districts' programme has demonstrated how monitoring of district objectives can foster healthy competition between districts, enabling each district to achieve its mandates. When the AI-powered systems are started and operationalised, they can only develop when more and more data is available. (Kant, 2019)

One of the goals of the Quality Education agenda is to increase our nation's supply of trained teachers significantly by 2030. Although the wide supply gap that exists cannot be filled, teaching can be made more effective using AI applications. There is no need for the existence of risks to eliminate our hope but rather to create a mature target. Many have drawn a vision for a better system of education.

In the next few years, due to AI-powered technology there will be several improvements to the work of an educator and educational best practices. Today's students will live and work in a world in which AI is the real thing and it is necessary for our educational institutions to reveal and use the technology. Although significant improvements in the system can take years, artificial intelligence has the ability to change how we think about education dramatically. In the meantime, AI will help meet need gaps in learning and teaching, as artificial intelligence-powered educational solutions are growing, allowing schools and teachers to achieve more. This will mean that India, having a significantly increasing youth population, can harness the immense potential of AI application in education, to achieve her goal of being a 'superpower', or a 5-trillion-dollar economy.' (Maskey, 2020)

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