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Title:

TRANSFORMING EDUCATION: THE ROLE OF ARTIFICIAL INTELLIGENCE AND TECHNOLOGY IN SHAPING MODERN EDUCATION

AI IN SPECIAL EDUCATION: SUPPORTING STUDENTS WITH DISABILITIES

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Abstract:

The main reason behind this particular research has been a way to find out and understand the technicalities while using AI in special education for children with disabilities and also emphasize on complications faced by the special educators where AI might step up and resolve at the least for proper functioning of such schools. During this process, a question was also raised if AI was at all the right fit in field of slow learners which was eventually resolved with the idea of shifting its implementation by making it more parent and teacher oriented than the student, thus helping them monitor their child's development in curricular areas in school.

First of all, a brief study by comprehending the statistics help in focusing the generalized applications of AI for a larger group of people over a larger arena of population nonetheless being subject specific in this case of AI being put into practice for special education.

A survey was being carried out while questioning a few special educators regarding their experience with technology and their needs and wants to help slow learners as well as students with other disabilities achieve their basic schooling requirements and thus propose for an idea that has come up with keeping in mind the needs of those working in the field for their suitable implementation in special schools and outside as well.

Introduction:

Technology is nothing but an ease developed during a crisis. It is sometimes a result of either need or want depending upon the circumstances that has led to the want for a particular development.

Education has been the most developmental yet the last developed in terms of its application and the mode of application.

Traditional and conventional methods have been used for many centuries and have not seen much growth or development until there was a crisis that raised the basic need to make contact for schooling and educating students.

Years of the same conventional practice of schooling which once involved the young learners leaving their houses to complete their education via means of gurukul then transformed into them attending schools for a stipulated shorter time period has not

changed with a blink of an eye. Even before a 5-hour long schooling was introduced children usually had a whole day of school from morning to meals being served along with an afternoon nap followed by playtime in the evening. What felt like a fortune to attend for this much period of time was now reduced to a couple of hours.

However, with the outbreak of the pandemic, the 5-hour schooling including getting ready, travelling physically, meeting people in person and learning as well as having fun was reduced to an even shorter yet easier and efficient way of schooling.

What was once taught on a black- board was then conveyed efficiently and effortlessly via no disturbance in these online methods of education has not only transformed these methods but has also enhanced and empowered both the teachers as well as the students in their own ways.

AI is observed more in a personalized form as it involves a thorough and complete product especially more in an informal way the kind of comfort one seeks while curiously asking for queries which rather be efficient than any other formal source. However, whilst thinking of the target audience of such a software being especially abled, to even seek for the utter help they might need while resolving their educational and curricular task is itself rather a trickier one. Therefore, in such a case it is quite challenging and needs analysis on the basis of targeted niche, whom to target, survey for the prevailing as well as current circumstances given that not only the targeted special students shall be taken into consideration but also their parents and special educators have been involved in this particular research.

Objectives:

This research explores the nooks and corners about how can AI be implemented for special education to,

Evaluate the strengths and weaknesses of its implementation.

Analyze, compare and contrast the existence of AI in special education versus in normal circumstances and help the parents early diagnose for their child's disabilities if any at prior stages.

Help the parents towards acceptance of their child's disabilities, that are generally viewed as a major problem while identifying disabilities in children.

Predict for possible obstacles in not only implementing such AI softwares but also designing them to be completely oriented towards its users for their proficient functioning.

Propose for a complete and wholesome AI with keeping in mind the requirements for the said formation of the software.

Statement of the problem:

The first and foremost issue while looking at this major topic is that the correct diagnosis which is usually done by psychologists or people who have the expertise however early detection by parents might be helpful. Yet at times parents usually are in denial about their children lacking a type of ability as compared to their fellow mates, thus there arises an issue of parent acceptance and primary diagnosis. Diagnosis itself is not fulfilling, since there is a labelling process that follows, done by the psychologist specially designated to perform certain tests that confirm the type of disability a particular child has, this can also be an area of exploring where AI can be at the shortest hand.

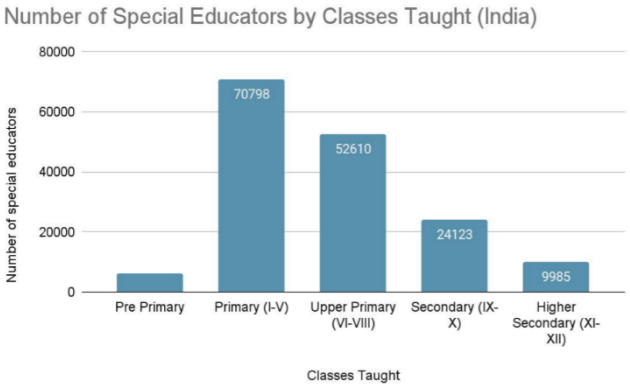
A recent report authored by Upasana Nath (Public Policy Associate, Pacta in June 2024) regarding state of special educators in India revealed that the percentage of enrolment of CWSN (Children with special needs) in India is only 34% not even close to the half of the student population in need.

"From access to education, to being read to at home; children with disabilities are less likely to be included or heard on almost every measure. All too often, children with disabilities are simply being left behind." says a UNICEF press release: (Nov 2021)

Once the children are in the hands of the special educator, it is usually very uncertain for the child to progress positively, there can be uncertainties too, hence there is a need for sufficient provision to handle the database that usually the special educators themselves keep an eye on.

Problems with ADHD students while educating them, schooling them and simultaneously treating them overcome their disability to some extent.

The teacher to student ratio is morbid as personal attention is required; lack of such teachers leads to burdening the teachers thus not leading to achieve their ultimate goal. The PACTA (JUNE 2024) report claims an "unhealthy PTR" i.e. the pupil teacher ratio being inappropriately scarce. This report also throws some light on the issue that "The number of special educators in pre-primary level is the least" meaning, that the most required number of special educators in the pre-primary level are contradictory, i.e. the least as shown by the statistics in the report.



(Cited: State of Special Educators in India – A Data Narrative Compelling Urgent Action. Pacta, Bengaluru, June 2024)

Source: https://www.pacta.in/Special_Educators_in_India.pdf

One of the major drawbacks to the "unhealthy PTR" as said by the report in "PACTA" is the inconsistently tailored provisions and policy for the renewal their enrollments, that has led to a significant decline in the number of special educators.

The arena of disabilities of children in education is so vast that for an Ai to be curated, there is no one generalized format or algorithm which once cracked can be implemented to children with similar disabilities hence, a perfectly programed AI is in the requirement.

Guide the special educators for personalized programs for each and every individual even if they are a part of the child's treatment from the beginning or have joined halfway through it.

The need to prepare for a detailed report and analysis of particular child on the basis of the previous year's record and remark for the same is in question.

Overcome the problem of one-to-one sessions between the special educators and the students.

Maintain checks, and ensure proper implementation of curated programmes.

Hypothesis:

One can think of formulating a trouble-free provision to overcome the parent's fear for their child to be diagnosed with any learning disabilities by normalizing the existence of such a disability, wherein they themselves might be able to perform a self-counselling session, clear all of their doubts with the help of AI and project themselves towards positively accepting their child's disability. Rather if any parent is in doubt for their child, diagnosis, if possible, can be done at a primary level with the help of AI at their service.

One might also find talking to someone in person about their insecurities towards their child's disability timid, rather feel free to communicate with a robotic virtual counsellor about the issue also keep a track about it, and also start their treatment using basic and generalized solutions preferred by the AI.

A provision wherein it makes easier for government policies to be ratified and sanctioned for their purpose of fulfilling the educational needs of especially abled children and thus make it effortless for students to access such a provision without hesitation is a question to think about.

In a one-to-one conversation with a former special educator, Mrs. Vaishali G.(Navi Mumbai), she specifically drew attention to the fact that handling so much students at a time with a need to be personally attentive towards them and at the same time be alert about journaling their each and every move for their further diagnosis of the progress they've made at the end of the year was pragmatically impossible or at the least incompetent to an extent where the human tendency to miss out on each and every detail would lead to a performance deficit or at least inadequate results. Here, what is strived is a database handling and diagnosing system or a software that makes all the efforts of recording, aggregating and thus arriving at a conclusion for the student's individual progress.

For the successful formulation of a well-designed software that is user friendly to each and every special student with diverse disabilities a strong database is necessary. Along with the database is an expertise of study and research over patterns of behaviour and opinionated techniques to handle those with attention deficiency is quite a task. Although not only designing the same is tough but customizing it in accordance to each and every distinct personality trait is a tougher task too.

It should be acting as an aid to the special educators and new trainers to inculcate new and modernized activities that are diverse and altering in nature to engage the students and achieve our goal of finally reaching the goal.

One might find it helpful if a program is curated in such a way that the student teacher ratio is maintained and at the same time the teacher can administer a batch of students effortlessly without facing any sort of incapability, this might not only be helpful to the teachers handling these students but resolving the PTR ratio problem as well. Or can we say that machines can overcome the lacking hand of man power where it is needed.

“Therefore, an assistive learning tool that can be personalised for children’s individual learning challenges and needs would be very helpful for teachers and a great support in helping students meet their individual goals. Although learning a new tool and teaching children to learn the assistive tool may be time-consuming initially, the benefits of using such tools to support individualised learning and improve overall clinical and educational outcomes are clear.”—MDPI’s International Journal for environmental research and public health states. This coins a new aspect of time consumption while introducing such a completely unique system, although it is acceptable to some point given that the long term beneficial profit in extents of this topic.

Methodology:

AI has always projected to work towards proficiently an individual but at the same time target a large number of audiences giving them a personal touch of resolving their queries and still manage to source all of these from designated and published sources. Ideas being transformed into various projects of individuals in seconds of time has made AI a fantastic technology.

Although the main motto for this research was fulfilled once, the keen approach of AI towards such a target oriented issue was observed yet satisfying. The sub-theme being quite a topic for a targeted audience, thus it has been more of a qualitative analysis than just quantifying problems and their solutions for the ease of bringing out the outcome. Here, undoubtedly quantity remains undermined over specific approach of qualified sphere of targeted audience.

Here, the overall approach of the research was initially projected towards the targeted audience being the students themselves, but after careful consideration along with a

brief conversation with experts involved, it was rather perceived that for such an approach of AI in this field it was not the target students who were to be actually taken into consideration but the ones administering them were.

This explains that, rather than making complicated provisions for the special students it would be more helpful if AI was to be introduced to their education via the teachers and educators involved and their parents themselves.

Even though the research was more projected towards this specific theme, the interviews conducted were rather candid in their approach. There was no limitations of questions to be asked or a specific parameter to be constrained for approaching the topic, nor the questions were limited or framed beforehand, yet the general areas that were to be touched for the crystal clear approach of the topic was observed. The reason for not framing a set of questions was to expand the idea beyond one specific thought process and instead make it less focused towards achieving the end product by discovering new aspects of such a theme by unfolding new mysteries to it. The mode of recording this data also leaves a strong impact on how candid the person who is interviewed, answers to it. That is, a formal approach and a "Q'nA" format sometimes might be daunting in addition to being constrained about its advancement. Thus, for a vast topic like this, a candid approach is quite reasonable.

However, as fascinating the numbers and the statistical analysis feels, it is very necessary to understand that the vagueness of this theme of applying AI in special education amounts to the fact that there is a requirement of one more factor than just relying on existing data and that is trial and error methods and bending according to the current and possible needs of the users.

Data analysis:

The study for this research has been quite a trivial in terms of the data gathered from sources that were used namely, other journals with similar issues, reports and testimonies of sources talking about similar issues in practice, also with a great helping hand of ebook materials and other statistical data from over the internet.

It was a vital role for a the statistics to study the basic aspects of enrollment numbers in "CWSN- (PACTA)" with a view to assess the target audience in the first hand. It is important to note that according to the report by PACTA, the top 5 enrollment is seen in states of:

1.Uttar Pradesh 2. Maharashtra 3. Bihar 4. West Bengal 5. Tamil Nadu; thus keeping into mind the non-existence of any influence of metro cities to the availability of such an aid. This might be as challenging as introducing AI in such a system of special education given that the technical assistance is needed and vital in every aspect as well. This also clarifies that if there is a scenario to introduce a trial and error method while testing for a bigger platform, which states are to be tested on first.

"**Assuming a 100% enrolment rate of children with special needs, the estimated number of special educators required is:**

• 6,57,300 (approx. six lakh fifty seven thousand) assuming PTR of 10:1, and

• 4,38,200 (approx. four lakh thirty eight thousand) assuming a PTR of 15:1" ---- as specified by the State of Special Educators in India – A Data Narrative Compelling Urgent Action. Pacta, Bengaluru, June 2024

This is a shocking truth that might be a cause and effect itself for the introduction on AI in these areas of education. It is indeed a challenging job for someone to introduce AI to students who themselves may not be that capable of using it thoroughly, thus needing it to be of more use and automated for them.

According to the MDPI's International Journal for environmental research and public health, the common individual practices that were specified are, Reading comprehension, Phonics, Writing, Spelling, Handwriting, Mathematics computation for students facing ADHD, however there are certain innovative and creative activities that the special educators practice, and this very area marks for the indulgence of AI in this subject of interest.

Suggestions:

The proposed analysis may provide esteemed perceptions into the complexities of the relationship between two variables - AI and Special Education, the outcome must be dependent on majorly few of the traits which can be explained,

That it may not be possible to directly use AI to have a direct interaction, however monitoring can be held and administered with utmost accuracy. Since, AI is well known for its accuracy when it comes to a detailed report of the students being sought after

careful considerations and examination of the child at the end of the year, so as to give them a pass for a higher level.

It is also insinuated to work on the algorithms for tracking an individual's change in behavioural patterns and academic as well as overall progress given that the criteria are specified by the authorities.

It also calls for a daily journaling system to be introduced of the ups and downs of each and every student, also ensuring the teachers to check up on the students behaviours according to the programmed parameters.

Any new inclusions in the teaching programs that were traditionally carried out can be very helpful in terms of working beyond imagination.

Conclusions:

Today's world is more about customizing things accordingly, and one can never be less thankful if the same has been done especially in the cases where a student is in the need of a mere assignment that he cannot copy from others. Thus in such a case, when it comes to including AI in a pre-existing model of education for automating, the said challenges shall be overcome with necessary measures being taken keeping in mind the user-friendly designing of software and also by shifting the focus to the ones administering the target audience as described previously.

This might be just an eye-opener from one particular point of view, that is the perspective might be shorter but the perception is undeniably broad-spectrum. Thus, limited sources can also count for a detailed research when it comes to a vast horizon of thoughts.

To conclude with, AI can be as supportive as the developers want it to be, towards special education, however, given the limitations of user deficit program, thus while keeping that into consideration and overcoming it might be lead it to a great success.

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