

# Impact of Big Data Technology on Education Sector

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**Abstract** - The world keeps changing due to the implementation of new Technologies. Big Data Technology (BDT) is one of the growing technologies which have made a drastic change in the Education Sector. BDT plays an important role in improving educational intelligence by enabling institutions, management, educators, and learners improved quality of education. BDT also enhances learning experience, predictive teaching and assessment strategy, effective decision-making and better market analysis. It can also be used for data analysis, detect and predict learners' behaviors, risk failures and results to improve their learning outcomes and to ensure that the academic programmers undertaken are of high-quality standards. This study identified that some universities and governments had implemented BDTs for transferring traditional education to digital one. Also, there are several challenges regarding its full implementation such as security, privacy, ethics, and lack of skilled professionals, data processing, storage, and interoperability. In this article, tried to focus on various impacts of big data on Education Sector and challenges to face in its implementation.

**Index Terms** - BDT, Big Data, Big Data Technology, Data, Data Analysis, Educational Intelligence etc.

## INTRODUCTION

The basic term included in the BDT is Data. One can define Data as a raw material provided to the computer. It may be in the form of text, number, table, image, sound, video or a combination of any of these[V]. This data can be stored on magnetic, optical or mechanical recorded media. Big Data is a collection of such data that is huge in volume and growing exponentially with time. It is a data with so large size and complexity that none of the traditional data management tools can store it or process it efficiently. Big Data has four important characteristics which are as follows:

a) Volume – The name Big Data itself is related to a size which is enormous. Size of data plays an important role in determining value out of data. Also,

whether a particular data can actually be considered as a Big Data or not, is dependent upon the volume of data.

b) Variety – The next aspect of Big Data is its variety. Variety refers to heterogeneous sources and the nature of data, both structured and unstructured. During earlier days, spreadsheets and databases were the only sources of data considered by most of the applications. These days, the data is in the form of emails, photos, videos, monitoring devices, PDFs, audio, etc. are also being considered in the analysis applications. This variety of unstructured data poses certain issues for storage, mining and analyzing data.

c) Velocity – The term 'velocity' refers to the speed of generation of data. How fast the data is generated and processed to meet the demands, determines real potential in the data [2]. Big Data Velocity deals with the speed at which data flows in the form of sources like business processes, application logs, networks, and social media sites, sensors, mobile devices, etc. The flow of data is massive and continuous.

d) Variability – This refers to the inconsistency which can be shown by the data at times, thus hampering the process of being able to handle and manage the data effectively.

Nowadays, BDT is used in various fields such as Education, Banking and Finance, social media, Businesses, healthcare, manufacturing etc. The education field is also going through some serious changes, and big data is something that keeps altering it for better. Big data has all the power to improve the learning process, make it more interesting and engaging so that students will become more involved in the process and will enjoy it. Education systems produce a huge amount of information about students and schools. This includes data such as students' attendance, achievement, their performance and socioeconomic background, as well as schools' population composition and instruction time. These and other kinds of information are important for the administration of education systems, but it can be also

very helpful for analyzing system's functioning and supporting its improvement. Access to data can help students to define their learning goals and strategies. BDT also provides information to parents about the schools colleges and the teachers for various programmes. By making use of this information parents can also help their children to select their educational career according to student specific context and needs. It can assist researchers in identifying what works best and new ways for data to further improvement. It also gives decision makers the evidence to design policies that better support their wards and schools. Big data can surely support educational change, but knowing which information to use, why and how is as fundamental as its availability. Schools, colleges and universities hold lot of information about students. If this information is analyzed using BDT, it will provide a good decision making facility to institutions for giving admission to students for various courses [6]. Big data analytics monitors student's activity such as their favourite subjects, their classroom performance, extracurricular activities, the time they take to finish an exam and many other things within a student's educational environment.

BDT helps the education sector in following ways:

#### 1. Better Decision Making:

At the point when schools store, order and examine volumes of data all the time, they will be in a superior position to create learning techniques and objectives that are practicable. Their basic leadership skills are stimulated when data is exhibited as a mix of detailed information, analysis derivations and the discoveries from educationalists.

Utilizing this data originating from various quarters, schools will be in an ideal position to enhance their teaching methods in order to acquire a more prominent significance in education.

#### 2. Improves Students' Result:

The overall idea of implementing big data within the educational system is to improve the student results. Currently, the only measurement of the performance of students is the answers to assignments and exams. However, during his or her life, each student generates a unique data track. Analyzing this data track in real-time will be help to gain a better understanding of the

individual behavior of students, and in creating an optimal learning environment for the students.

With big data in the education sector, it is possible to monitor student actions, such as how long they take to answer a question, which sources they use for exam preparation, which questions they skip, etc. These and similar to these questions can be answered automatically and instantly, giving each student instant feedback.

#### 3. Effective Performance Measurement:

Big data makes the assessment process more fast and accurate. It can check multiple-choice tests as well as essays, put a grade as well as give comments and recommendations that will help a student to improve their performance in the future. It fully eliminates bias and allows teachers to spend less time on routine automatic tasks and focus more on in-person communication with undergraduates and explain complex material more thoroughly.

#### 4. Customize Programme:

Big data technologies can help gather and analyze plenty of information aspects that define the way students are studying. With the help of big data, customized programs for each individual student can be created. Even if colleges and universities have lakhs of students, customized programs can be created for each of these students. This is possible with the help of 'blended learning' – a combination of online and offline learning. This gives students the opportunity to follow classes that they are interested in and also work at their own step. They can also take offline guidance by their professors.

#### 5. Career Prediction:

Diving forcefully into the performance report of the student will assist the authority with understanding his or her improvement and their weaknesses and strengths. If the reports will recommend the regions in which a student is interested and this will help to know he/she can seek a profession in which field. In case that a student is enthusiastic about taking in a specific subject, at that point the decision ought to be valued and the student ought to be advised to follow what they desire to follow.

#### 6. Decreased Numbers of Dropouts:

With improved learning programs and better student engagement, the educational institution will experience a decrease in the number of dropouts. Smart algorithms and big data can offer students personalized recommendations that will help them to improve their efforts in the future. If they are on the edge of being dropped out of college they will definitely change their decision.

#### 7. Digital Literacy of Teachers:

Big data lends a helping hand to create better education management systems. It creates conditions for developing digital literacy of teachers who could provide better assessment, collect data, and evaluate the behaviors, skills, and performance of their students. Having the right tools and metrics in their hands, they could evaluate their work, improve the classroom environment and significantly increase learning opportunities[iv].

Since, BDT is an emerging technology in the field of education, there are some challenges that has to face while using it. These challenges are as follows:

#### 1. Privacy:

Data Privacy is very important while using the BDT. Proper data authentication and data access should be carefully considered. Proper rights shall be given by the administrator to student and teachers to access the data.

#### 2. Presenting Data:

In Big Data the amount of data is very large. Many people are going to access the data, it is necessary to present it using desired format. Some strategies should be used to present the data.

#### 3. Transparency:

Proper rights shall be provided to the learners to access, store and share data as and when necessary. As the data is huge in size transference is important while using the data.

#### 4. Increase in Cost:

Much more data is produced but sometimes the data that is required by students or teachers may be expensive than the traditional data.

#### 5. Infrastructure:

Infrastructure plays an essential role in using Big Data Technology in the field of education. Upgraded and high quality infrastructure is needed to make use of big data for various educational purposes.

#### 6. Less Interaction with Students:

Using Big Data the assessments and recommendations are entirely based on analytics. There is a lack of personal bonding as the data is digital. The most important point is that use of BDT reduces the face-to-face interaction with students.

### CONCLUSION

In this article we had seen that, big data influences a huge potential in the education sector. It helps to fulfill various criteria's of the education sector. Though, we have to face so many challenges in using BDT, its implementation has already demonstrated positive changes. It will be helpful for students as well as teachers in many aspects. We should expect more of the modern technologies, and we will welcome the latest changes.

### REFERENCES

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