Big Data Analytics using in the Field of Education System

Gagana H. S[1], Sandhya B N[2], Gouthami H. S[1]

[1]Faculty in Computer Science, [2]Student, M.Sc. in Computer Science,

[1,2]DOS in Computer Science, Mangalore University, Jnana Kaveri PG Centre,

Chikka Aluvara, Kodagu, Karnataka, India

ABSTRACT

This paper is a study on the use of big data in education analyzed how the big data and open data technology can actually involve in educational system. Present days we analyze how big mounts of unused data can benefit and improve to education sector. Big data has dramatically changed the ways in which leaders make decisions in natural science, Agriculture science, banking & retail business, healthcare and in education. In educations sector wide verity of digital data produced in every institution. For example the forms of data like videos, texts, voices etc. the digital educations improves both teachers and students understandings and improve teaching effectiveness. In education big data we use econometrics, causal inference models, social network analysis, text analysis, and linguistic analysis methods. Using different types of technologies adopting in education are mobile devices, teleconferences and remote access systems, educational platforms and services. This method is effectively used by students, teachers, academic faculty, specialists, and researchers in education.

KEYWORDS: Big Data, Online education, Digital educations, Big Data analysis

1. INTRODUCTION

Big data is one of the most used technology in education field. Higher and professional education is a domain which constantly needs to be evaluated and transformed to follow the fast pace of changing trends in different sectors in the market which in turn creates a variety of needs in workforce. The educational systems are not yet fully prepared to cope with and exploit them for continuous quality improvement purposes. For example in health professions education or health education is a context that these technologies are predominantly used, producing a wide range of educational data. In the universities or in the college the teacher receives daily all types of student data, such as attendance data, exam results, personal assessments, health issues, learning difficulties, the types of questions that the student is frequently asking, and other types of information. Digital learning involves online teaching, internal assessment, online examinations, evaluations, results, digital marks card and certificates etc. now a day most of the data are in Digital form and it is unstructured formats like student notes and all type information available in audio form, video or in the text formats. Big data in education system could be very useful in investigating and exploiting new technology and tools in this sector.

2. LITERATURE SURVEY:

One of the domains that volume, variety and velocity coexist in the data is the higher education. Large amounts of educational data are captured and generated on a daily basis from different sources and in different formats in the higher educational ecosystem. The educational data vary from those produced from students usage and interaction with learning management systems (LMSs) and platforms, to learning activities and courses information consisting a curriculum such as learning objectives, syllabuses, learning material and activities, examination results and courses evaluation, to other kind of data related to administrative, educational and quality improvement processes and procedures. The limited exploitation of big educational data and the size and type of these data within the context of higher education signifies the need for special techniques to be applied in order to discover new beneficial knowledge that currently is hidden within data. Such techniques can be derived and adapted from other domains characterized by big data and successfully used to manipulate big educational data. These techniques could be used to enable the development of insights "regarding student performance and learning approaches" and exemplify areas within big educational data such as students actual performance according to taught curriculum that can be positively impacted recently big data and Analytics together have shown promise in promoting different actions in higher education. More specifically, one of the identified areas in which big data and Analytics are appropriately applicable for investigation and improvement in higher education is the curriculum and its contents, as a major part of big educational data.

3. BIG DATA TECHNIQUES

"Big Data is the term for the collection of datasets so large and complex that it becomes difficult to process using ion hand databases management data processing applications".

The 4 V's of Big Data:
➢ **Volume:** It is getting vast as compared to traditional sources through which data used to be captured large amounts of data generated every second. (email, twitter msz).
➢ **Velocity:** The speed at which data is being generated, it is phenomenal and never stops the speed of data moving in and out data management.
➢ **Variety:** Data comes from various sources, machine generated and people generated different data formats in terms of structured or unstructured data. Data comes in all varieties in form of structured, numeric data in traditional databases to unstructured text documents, email, video, audio, stock ticker and financial transactions.
➢ **Veracity:** Trustworthiness of data the quality of data, as one little control of the volume.

3.1. BIG DATA APPLICATIONS
➢ Public sector services.
➢ Healthcare contributions.
➢ Education sectors.
➢ Insurance services.
➢ Industrialized and Natural Resources.
➢ Transportation services.
➢ Banking sector and Fraud Detection.
➢ Agriculture sectors,

4. BIG DATA CONTRIBUTION TO EDUCATION:

The use of big data has radically changed most of the industries. The education sector is one of the most prominent areas affected by this change. In recent days, educational institutions like primary and secondary schools to universities and educational service providers like online coaching is very effective to collect, use, and exchange data easily and faster than ever before. The term big data refers to the large amount of different information or data, which are difficult to collect and evaluate through traditional techniques in addition to being characterized by the need for rapid processing so that it can display the common points, trends, and patterns in the behavior of the targeted groups. In the education sector, data analysis can have a major impact on all workers, from teachers, students, and even coaches in educational leadership and management.

4.1. Big Data analytics is enhancing students learning experience:

The teacher receives daily all types of student data, such as attendance data, exam results, personal assessments, health issues, learning difficulties, the types of questions that the student is frequently asking, and other types of information. The teacher analyzes this data gradually so that he can adjust the learning process according to the needs of the student, and this is the personalized learning method, which is an educational curriculum that aims to allocate learning according to each student's strengths, needs, skills, and interests. Personalized education leads to great student participation and the teacher also helps to understand the level of each student individually, helping him to provide appropriate guidance, and additional resources to improve students' academic level.

4.2. Universities will be more accurate in suggesting career guidance for students:

Every year each universities collecting a huge amounts of data like student's exams, results, personal data, etc. By analyzing this data, the teacher or supervisor can analyze the data to generate a performance report, and if it turns out that this student is a talented artist, the report will recommend a career in this field. Now, they have access to big data that will show that the student is a talented artist, as well as good in math and physics, and according to this.

5. BIG DATA ADVANTAGES FOR EDUCATION
➢ The use of big data in education facilitates personalized education & easy learning
➢ Enhanced and Advanced learning & teaching experience
➢ Improve the educator effectiveness
➢ Provide appropriate, efficient and effective teaching and learning environment.
➢ Big data facilitates the communications and accessibility for learners, educators, and administrators.
➢ Improved quality of education.
➢ Easy to interact b/w students and teachers.

6. BIG DATA CHALLENGES IN EDUCATION
➢ Security: enormous amount of revealed information can cause disaster & misused sometimes.
➢ Privacy: Stored education records, performance, and how, when, and where they click each time to log in, can also be used by a malicious insider. It is about privacy data matters.
➢ Ethics: Educational data collection and use is not subject to any formal ethical review process.
➢ Timely analysis of data & transfer the data
➢ Efficient and effective data capture: collections of data is not an easy way because data available in different forms.
➢ Storage: most of the data are in unstructured formats like videos, audios, picture, word, pdf, ppt, etc. these data increases data storage size.

CONCLUSION

Big Data improves the productivity of education outcomes using its technology all over the education systems levels, at teaching, learning, analyzing, administration, and reporting. The application of big data in education mainly refers to the three elements of online decision making, learning and big data. Its main function is to apply and study the analysis and behavior of students and faculties. The meaning of big data in education system means there is a large amount of data generated from the learning sector then students can access their interested information or topics in digital formats only. Teacher/faculty and university specialist try to collect new technology concepts, adopting advanced tools then guide their students effectively. Already some educational institutions adopting the new learning methods and making more efficient and effective in teaching. The teachers and academics must be train and involved on them and finally the students must accept and use these new technology & tools.

REFERENCES:

[1] Saptarshi Ray, "Big Data in Education", Gravity, the Great Lakes Magazine, pp. 8-10, 2013.

[2] Peggy A. Ertmer and Timothy J. Newby, "Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective", Performance improvement quarterly, Vol. 6, No. 4, pp. 50-72, 1993.

[3] Wikipedia, "Big data --- Wikipedia, The Free Encyclopedia", https://en.wikipedia.org/w/index.php?title=Big_data&oldid=669888993. Accessed 2015.

[4] George Siemens, "Connectivism: A learning theory for the digital age", International Journal of Instructional Technology & Distance Learning, Vol. 2, No. 1, 2005.

[5] D. Bollier and C. M. Firestone, The promise and peril of big data. Aspen Institute, Communications and Society Program, 2010.

[6] S. Brin and L. Page, "The anatomy of a large-scale hypertextual Web search engine," Comput. Netw. ISDN Syst., vol. 30, no. 1, pp. 107–117, 1998.

[7] A. McAfee and E. Brynjolfsson, "Big data: the management revolution," Harv. Bus. Rev., vol. 90, no. 10, pp. 60–66, 2012.

[8] A. Bhatia and G. Vaswani, "BIG Data–A Review."

[9] J. Yan, "Big Data, Bigger Opportunities," 2013.

[10] A. Jacobs, "The pathologies of big data," Commun. ACM, vol. 52, no. 8, pp. 36–44, 2009.

[11] D. Bollier and C. M. Firestone, The promise and peril of big data. Aspen Institute, Communications and Society Program, 2010.

[12] A. McAfee and E. Brynjolfsson, "Big data: the management revolution," Harv. Bus. Rev., vol. 90, no. 10, pp. 60–66, 2012.