

# Analysing the Adoption of E-Learning Experience in School Education System of India: Challenges and Issues

Jahangir Kamal<sup>a</sup>, Dr. Meenu Dave<sup>b</sup>

<sup>a</sup>Jagannath University Jaipur Rajasthan, India 302022, <sup>b</sup>Jagannath University Jaipur Rajasthan, India 302022

**Abstract:** Educational institutions (schools, universities, and colleges) in India are at present founded uniquely on conventional strategies for realizing, or at least, they follow the customary set up of close and personal talks in a study hall. A large portion of the scholastic area began bound together learning, still the vast majority of them struck with old advances. In case of School Education System, adoption of E-learning process plays a very important role with a number of benefits and problems. As we know, if we will talk about Country India, it has 60% of rural areas where electricity and internet facilities are not available in a proper manner i.e. in sufficient amount, so adoption of E-learning in School Education System in case of India face so many problems. This paper presents the analysis and assesses the E-learning experience in the School Education System of India-evaluating the technological issues. It also evaluates privacy, security, and ethical issues related to the use of students' data.

**Keywords:** E-learning system, School Education, Data Privacy and security, Traditional Teaching.

## I. INTRODUCTION

People's learning habits are altering as a result of the digital transformation, so understanding of how to use the industry's digital tools as well as social media platforms is essential for 21st-century learners. Libraries, museums, as well as community centres are improving their technologies so that younger folks may use digital facilities during the day, opening up new chances to learn anywhere at a moment, any place, and at any speed. The expansion of information and communications technology has revolutionized the style of learning, as well as the recourses for learning and teaching are evolving in a blinded fashion as a result of the massive growth of academic institutions. As a result, E-learning has exploded in popularity across all types of businesses and academic facilities.

In India, School Education System at present is at a transition stage. A phase where changes have occurred for great and more changes in considerations and cycles are wanted. Advanced education framework in any country today looks for a relook. Computers and the Internet have aided education by allowing for a variety of teaching, learning, as well as evaluation methods to be

implemented on/off-campus, in the school-room, or on a virtual machine. Digital social media and the internet have done digital and remote learning a new skill to everyone, irrespective of age, gender, or employment status, at a minimal price [1-3]. In comparison to conventional education, which needs specified age and abilities in addition to a

presentation at a certain location and time, online learning sites such as Coursera, Show Academy, and Udemy provide classes online for anybody who wishes to study.

Due to the obvious advancement of Information Communication Systems (ICT) and the emergence of smart electronic devices, mixed style digital and conventional learning spaces have evolved [4]. Furthermore, the presence of Social Networks as well as Web 4.0 has permitted upgraded learning and teaching tools to provide better educational practices and better outcomes. A few contentions are related with E-learning. Openness, reasonableness, adaptability, learning teaching method, long lasting learning, and strategy are a portion of the contentions connected with online instructional method. It is said that online mode of learning is easily accessible and can even reach to rural and remote areas. It is considered to be a relatively cheaper mode of education in terms of the lower cost of transportation, accommodation, and the overall cost of institution-based learning.

Flexibility is another interesting aspect of online learning; a learner can schedule or plan their time for completion of courses available online. Combining face-to-face lectures with technology gives rise to blended learning and flipped classrooms; this type of learning environment can increase the learning potential of the students. Students can learn anytime and anywhere, thereby developing new skills in the process leading to life-long learning. The government also recognizes the increasing importance of online learning in this dynamic world. The public authority likewise perceives the expanding significance of internet learning in this unique world.

Every day, the amount of data in the world increases. The

usage of the internet, smart phones, and social media has increased data. Big Data consists of a collection of data sets that are both huge and complicated. The data is usually measured in petabytes or Exabytes. Traditional database systems are incapable of capturing, storing, and analysing this volume of data. As the internet expands, so does the volume of Big Data. Businesses and government agencies can use Big Data analytics to examine complex data in innovative ways. Big Data is one of the most talked-about subjects in the IT business these days. It can play an essential role in the future direction and reformation of School Education System in India. The way data is handled and used is changing as a result of Big Data. Healthcare, traffic control, finance, retail, education, and other fields are among the uses. Companies have become much more adaptable and open. New sorts of data will also provide new obstacles. The goal of this study is to assess the feasibility of designing and implementing an E-Education platform for Indian School Educational curricula.

There are following objectives of the proposed work;

- To explore the growth of E-learning Start-ups and online learning.
- To conduct Strengths, Weaknesses, Opportunities, & Challenges (SWOC) analysis of online learning.
- To give some suggestions and recommendations for the success of online mode of learning during a crisis-like situation.
- This research also examines the benefits, applications, and problems of Big Data technologies in the School Education sector of India.

## II. BACKGROUND

This section contains the previous research data related to adoption of E-learning in different education systems on the basis of technological issues and to evaluate privacy, security, and ethical issues related to the use of students' data.

This research demonstrates how the E-Education platform enhances student learning or how it supports the effective performance of overall teaching activities. Before providing the idea of this E-Education method, the current Indian tool for addressing as well as the program implementation methodology in schooling have been analysed. Authors have explored the current state of E-Learning in Finnish research universities and performed a comparison of Indo-Finnish educational establishments [1].

This discussion includes the opinions on the relevance of constructed system (Ville E-Education System) to Indian primary school courses and also predicted implementation

impacts. Furthermore, the authors showed that the method chosen is green, ecologically friendly, as well as closely aligned with the objective for future big universities to minimize the usage of paper [2].

This research looks into the feasibility of employing E-learning in higher education. The use of current data and knowledge technology for learning is critical in academic institutions. This investigation examines the literature and provides a scholarly context for the study to examine some of the achievements made by different academics and organizations to the notion of E-learning, specifically its application in E-learning in higher academic institutions. Through questionnaires and other studies, it reveals some of the perspectives that people and organizations around the world have on the implementation and acceptance of E-learning technologies in schools. It examines the many academics' interpretations of E-learning, as well as the function that E-learning performs in colleges of education concerning the teaching process, as well as the benefits and drawbacks of its selection and implementation [3].

Data reliability is also represented in rules of international law and regulations, where sensitive data is often regarded as constitutional freedom. For the LEA's BOX project, current laws, techniques, and regulations were used to provide a complete privacy and data protection structure. It consists of a set of eight principles derived from which consequences for assuring ethical consideration of private information in a learning analytics solution and its offerings may be deduced. The application's information privacy policy is integrated into the project's learning analytics tools that could be used as a recommended practice for other teaching analytics initiatives [4].

The global speed of E-Learning has prompted key metropolitan areas in the Asia-Pacific region, like Singapore, Hong Kong, Taiwan, as well as Beijing, to formulate and implement state policies on E-Learning to improve School Educational standards. This article evaluates and draws lessons from the experiences of these four key Asian urban centres in developing E-Learning strategies in the areas of transportation, curricular linkage, student learning, teacher performance, leadership, and institutional capacity.

Each of the 4 key Urban areas has been recognized as having its field of expertise in the management of future e-Learning policy initiatives, with Singapore concentrating on scale-up good practices of e-Learning amongst teacher society, Hong Kong striving to make digital classrooms endorsed by wireless connectivity for student-centred lessons, Taiwan concentrating

on nurturing educators with 21st century learning via daily improving student learning, and Beijing concentrating on supplying Five further considerations for E-Learning regulations are presented to serve as a guide for other cities/regions developing future E-Learning plans for schooling in the twenty-first century [5,6].

Students' attitudes and ideas about E-learning, and also their pleasure with technology and previous E-learning encounters, are all considered success factors for prospective E-learning efforts. While there has been little discussion of E-learning and its possible benefits for developing nations in the literature, there has been little study on user perceptions of E-learning in those nations. The results from engineering students at two Libyan institutions on their experiences and perspectives of innovation learning are presented in this study. There is also an examination of the links among students' views about E-learning as well as their demographic features, availability of technology, use of technologies for learning, technological skill, and contentment with new technologies. Academics, executives, and decision-makers related to the planning, development, and execution of prospective E-learning methods in Libya and other emerging countries may find the findings of relevance [7].

Existing and developing E-learning capabilities are transforming educational institutions in dramatic, immediate, as well as disruptive ways. The increased use of E-learning technology in all areas of education has resulted in increased global competitiveness, improved educational experiences, the elimination of situational barriers, and economic viability. The purpose of this article is to analyse the acceptance and use of E-learning in Ugandan academic institutions [8].

The digital nation's economic players are increasingly reliant on huge data gathering and interchange. Because online data could be durable and vast, E-learning researchers and practitioners should educate users to make good use of it while disclosing it with discretion. This research explores personal data privacy problems connected to curriculum strategies and E-learning, based on comprehensive literature analysis. Rather than repeating that users have to be conscious of the relevant and durable properties of internet information. The authors want to comprehend the online data security problems that instructors or curriculum developers face. The topics that arose from the literature review could be divided into two groups. The first paradigm includes the presence of data security as a particular subject in the educative development of E-learning, while the second paradigm relates to the recognition of privacy concerns as a special concern in the

curriculum strategies of E-learning. The review's findings are then examined, as well as their implications for the future [9].

Various E-learning systems and related education technology paradigms are identified and evaluated in this research. The study goes on to look at and suggest a new framework for large data convergence. In addition, the study examines the range of prospective data analysis as well as the importance of large datasets in the E-learning context. The authors hope to gain a deeper understanding of the problem as well as try to overcome the problems and open problems related to the moral and confidentiality context of education analytics practice through a European collaboration that includes the EU construction LACE, the SURF SIG Learning Predictive analysis, the Apereo Foundation, as well as EATEL SIG Datatel. The goal of this participatory session is to increase awareness about important ethical and privacy concerns. It will be utilized to create real solutions that will help to improve the use of learning analytics technology [10].

The goal of this study is to comprehend the fundamentals of E-learning as well as the various evaluation methodologies available. Some India free learning resources (OER) projects also are discussed. In a digital environment, various methodologies of gain are made accessible, since technology allows for the inclusion of sound, video, and animation files in the educational environment. Due to the expansion of the E-learning ecosystem, this article provides an analytical examination of some of the available e-learning- learning evaluation methodologies. It addresses cutting-edge evaluation techniques [11].

The Aspen Centre Working Group on Education as well as the Internet researched how young people learn nowadays during 2014. The Task Force included inventive as well as respected brains in technology, public policy, education, as well as business safety. They discovered that for 21st century surroundings to fully benefit from the opportunity afforded by Inter, severe trust, safety, confidentiality, numeracy, as well as equity of access should be resolved. Among other suggestions, the working group discovered that the best approach to establishing online learning climates should be for all interested parties having to learn primarily civic authorities, community organizations, family members, teachers, students, as well as businesses—to set local, state, as well as, national student achievement goals [12,13].

### **III. IMPACT OF E-LEARNING ON SCHOOL EDUCATION SYSTEM OF INDIA**

Over the last 50 years, India's government is providing full

encouragement as well as significant public finances to help build one of the nation's biggest School Education institutions [1]. Apart from a few notable exceptions, these institutions have not been capable of sustaining high educational standards or keeping up with changes in domains such as science and skills. Financial restrictions caused by rising student enrolment and high demand for basic and secondary education have caused the government's financial assistance to deteriorate over time.

It is essential to determine an inclusive learning solution, particularly for the most vulnerable and marginalized. With the drastic improvement of mobile internet, users in India are expected to reach 85% of the household by 2024. Technologies allow for high-speed access and personalized education, even in the remote areas of the countries. This will change the education system and enhance teaching and learning, presenting numerous options to choose from students and teachers. Many aspirational districts have launched innovative, mobile-based learning models for the active delivery of education, which others can implement.

Furthermore, it has been hindered by an overall system of numerous regulations and a restrictive bureaucracy that has stifled its progress. The majority of the population lives in rural regions, therefore educating them about E-Learning is a huge difficulty. Another difficulty is an inadequate infrastructure to show the relationship, Internet access, and so on. The government is pursuing a variety of initiatives to change communication infrastructure and new technologies [2], such as 4G in the telecommunications arena have already begun to improve this situation.

Another area of research that is critical to understand for the effectiveness of E-learning in India is the social consequences of E-learning. Cultural, sexuality, economic, geographical, spiritual, numeracy, impairments, and access to technology are some of the difficulties that E-learning has societal repercussions. Content, multimedia, creating information, writing styles, Website design, as well as changing developments are all included in the cultural concerns category [3]. Although certain content is required for the course, it may well be inappropriate or unflattering to some students. How can a teacher or instructor direct the class to include or remove topics if they are conscious of the context of the conversation or cover the area? Even prose style can have an impact on how an online course is run.

The adage "different measures for different persons" must be followed—ideally with the least amount of interruption to the class time. Geographical distinctions and challenges become

highly evident [5], particularly when viewed from a global perspective. If a chat room engagement is to occur, for instance, all affected time zones must be handled. Insensitive local humour will also fall under this group. Even the technological issue of Internet connection must be taken into account. Integrated education, adaptable education, web-based having to learn, action learning, as well as construction learning are all made possible by modern E-learning developments. Learning management systems, content management systems, implementing educational, freely distributable component object models, as well as application program interfaces [15], were used in educational software initiatives to enhance as well as expand learning frameworks to a wider horizon.

The road rules for writing tasks must be understood by both the learners and educators. What participation responsibilities are anticipated and/or tolerated, and who is responsible for maintaining discussions and assignments on track if the goals are not fulfilled? Even though individuals are divided by miles or even continents, sexual concerns remain a part of the classroom [4]. To ensure gender neutrality, it may be the instructor's job to oversee facilitation and rotate leadership responsibilities in groups. Any difficulties with behaviour should be identified and resolved right away. Lifestyle differences can take many forms, and the instructor must be vigilant to ensure that all students are treated equally, despite their lifestyles as well as interests. In some cases, the pupils will supervise themselves, but in others, the teacher will be required to intervene.

In certain areas, dial-up connectivity is the only option for getting online; there are no other options. Religious and spiritual concerns should be taken into account and respected [6]. Given that some days could be spiritual days for various religions, it may be undesirable for a teacher to compel work on those days; instead, recommend a chunk of time during which tasks can be allocated. Religious sensitivity is essential. For an online class, literacy must be assumed, but it should not be neglected. Regardless of the classroom level, there would certainly be individuals who lack (or could enhance) some skills: reading, composing, information, as well as encoding (typing), are all skills that are important but might be improved. Disabilities should not be ignored. Within these social ramifications, the Generation Gap is the last area to be covered in this discussion. Irrespective of how the phrase "internet" is used, it implies that there is a separation, either between broad and minority communities, men and women, disabled people and the general populace, or young and older people of the school. It all comes down to distinctions who

don't have something (whatever that something is) or those who don't have it. Access to technology and instruction in how to handle it will aid in closing the digital gap [16], or the gap between both the haves and the have-not. Figure-1 presents different factors that affect the E-learning process.

Intermediaries are used in the current educational system to facilitate interactions between educators and students. BDUs make analytics and insights easier, but they aren't very secure. Learners and instructors can exchange data and interact directly to complete the teaching-learning activities without using middlemen thanks to sophisticated technology like blockchain and its sophisticated secure payment system. Due to its scalability, blockchain enables increased security and data integrity because no one regulates data entry or authenticity. Furthermore, the blockchain's integrity is continually verified by every computer on the network, making it unchangeable (the information remains in the same state if the network exists). Only authorized personnel on the same system have access to the block and can use its services. But, integrating blockchain into education necessitates the creation of suitable database architecture [17], and the education and hiring of new workers, as well as persuading directors and investors that cryptocurrency is worth the expense of investment. Instant measures are essential to guarantee continuity of learning in government schools. Open source digital learning solutions and learning management software should be adopted, so teachers are encouraged to conduct teaching online. DIKSHA (Digital Infrastructure for Knowledge sharing) platform reaches throughout all regions of India, can be further to ensure proximity to student learning.

Strategies are intended to produce the School Education System for growing demand-supply dynamics worldwide, particularly those associated with student and faculty's urban development, enhancing India's quality and potential School Education System. Additionally, it is necessary to take immediate measures to mitigate the impact of a disease outbreak on employment opportunities, training programs, and academic research.



Fig. 1: Factors affecting online School Education in India

#### IV. CHALLENGES OF E-LEARNING IN SCHOOL EDUCATION SYSTEM OF INDIA

Online learning faces many challenges ranging from learners' issues, educators' issues, and content issues. It is a challenge for institutions to engage students and make them participate in the teaching-learning process. It is a challenge for teachers to move from offline mode to online mode, changing their teaching methodologies, and managing their time. It is challenging to develop content which not only covers the curriculum but also engage the students. The quality of E-learning programs is a real challenge. There is no clear stipulation by the government in their educational policies about E-learning programs. There is a lack of standards for quality, quality control, development of E-resources, and E-content delivery. This problem needs to be tackled immediately so that everyone can enjoy the benefits of quality education via E-learning. One should not merely focus on the pros attached to the adoption of online learning during the crises but should also take account of developing and enhancing the quality of virtual courses delivered in such emergencies. A lot of time and cost is involved in E-learning. It is not as easy as it seems, a considerable amount of investment is needed for getting the devices and equipment, maintaining the equipment, training the human resources, and developing the online content. Therefore, an effective and efficient educational system needs to be developed to impart education via online mode.

E-learning data is made up of a vast amount of educational data that can be accessed through a complicated and hybrid data architecture. Other challenges faced by E-learning software applications during evaluation are collecting students' achievement, student assessment, as well as customer survey responses. For analysis, combining student information with instructional data necessitates a complicated system

framework. Customer satisfaction with a company's products and services is critical to its success in the marketplace. Because of the constant nature of online and the rise of blogs, forums, as well as user feedback, individually identifying and extracting data properties is still a major issue in almost every business. It takes a long time and a lot of labour to gather information. To solve these challenges, businesses must employ big data operations to concentrate on consumers by implementing data processing with high quality to ensure product quality as well as contentment.

Ensuring digital equity is crucial in this tough time. Not all the teachers and students have access to all digital devices, internet, and Wi-Fi. Unavailability of proper digital tools, no internet connections, or iffy Wi-Fi connections can cause a lot of trouble due to which many students might lose out learning opportunities. Efforts should be taken by institutions to ensure that every student and faculty is having access to the required resources. They must also ensure that all the educational apps work on mobile phones as well, in case students do not have laptops. Therefore, steps must be taken to reduce the digital divide.

## **V. EVALUATION OF PRIVACY, SECURITY, AND ETHICAL ISSUES RELATED TO THE STUDENTS' DATA**

Edsger Dijkstra said in 1972 that "computers have just created a new issue: figuring out how to use them efficiently" [18]. This is particularly true in current scenarios when it comes to cutting-edge instructional technology. Here we are discussing the issues that twenty-first-century educational technicians are facing, and will face, as they work to integrate new technology into School Educational institutions and learning settings. The expanding Internet, increasingly sophisticated mobile devices, as well as other advancements, makes it difficult to design efficient learners and educators, particularly given the rapid rate of growth in these technological advances. While these technologies provide several advantages, they also pose significant risks to system security and individual privacy. Moreover, as these capabilities advance, ethical considerations like equal availability of resources will become increasingly important. To ensure the efficient use of new technologies, educational technologists must enhance their forward-thinking management and organizational skills.

Learning analytics programs must adequately address ethical, security, and data protection concerns to bridge the gap between learning analytics study and personal privacy. There are some general recommendations, model codes, and rules for dealing with ethical issues as well as adequate data and

personal privacy that may be useful when considering these problems in the case of learning statistics. But the researchers have discovered that data protection difficulties are a big issue in E-learning. Large-scale data gathering, aggregation, as well as computation from a variety of learning websites and digital settings, has raised confidentiality and environmental concern about the potential harm to people and society. These kinds of concerns have previously affected diverse fields as computer programming, legal studies, as well as monitoring studies.

Considering Big Data technology benefits of extensive educational offers, there are still some obstacles to overcome, including security, privacy, lack of educated professionals, data analysis, retention, as well as compatibility. Big Data can be a double-edged sword. The growing amount of information will raise the chances of non-public private information being violated. The vast volume of data produced in modern society has expanded as a result of several innovations and advancements that saturate our daily lives [19], such as smartphones, social network apps, as well as IOT of Things-based expert machines.

During data acquisition, preservation, as well as usage of information, private details might be exposed quickly, making it difficult to comprehend data. The goal is to combine this variety of data into a single platform for Big Data processing and to identify privacy issues. Privacy is one of the most serious issues raised by Big Data. The research on Big Data privacy, on the other hand, is still in its early stages. We believe that the upcoming Big Data privacy technologies and theories are rooted in the security discipline's existing research output.

## **VI. SOLUTION FOR THE CHALLENGES AND ISSUES OF E-LEARNING**

As the educational teams and managers of E-learning systems now have access to essential techniques and digital APIs that they did not previously have [8], allowing them to make better decisions and choose from a wide range of innovative learning approaches. The focus should be on creating a course selection system that will automatically create more appropriate courses for each individual and lead them through the learning experience. The current technologies also allow for the conversion of E-learning content across regional boundaries.

The goal of this study is to incorporate the next generation of technological tools, particularly Big Data innovations, into data centres for human learning that are devoted to online courses. Big data allows for high-performance parallelization and distribution of massive amounts of data generated by

learners as a result of their interactions with a conceptual view [7]. It enables high-level frameworks to provide several benefits that can be used in online learning to make significant advancements in this educational field. Under the E-learning context, this education, as well as student or customer data, are joined to make big data design, as well as mining this big data from the various demands or information discoveries necessitates creative techniques. As a result, our strategy has the potential to significantly improve the web-based learning field, allowing each learner to reap the greatest perceived advantages.

Other big data technologies devoted to predicting learners' behaviour and enabling real-time surveillance of students' actions should be inducted in the E-learning system of School Education System of India. Despite the numerous advantages of using Big Data technologies in schooling, there are still several obstacles that prevent their complete application. When using Big Data technologies in schooling [20], take into account the complexity of designing and building Big Data, particularly with legacy of school institutions, as well as the scarcity of experts, and security including moral concerns.

In the E-Learning sector, Big Data refers to the information generated by students when they are enrolled in an E-learning course and training module. The phrase "Big Data" refers not just to the amount of data is gathered, but also to the individual chunks of information being gathered. The analysis of Big Data can be conducted to give organizations or E-Learning experts insight into how the student is absorbing material, at what speed, as well as to identify any issues that may present within the E-Learning approach. The implementation of data mining methods and ideas in various production process models, as well as observational research on how to retrieve information from the Database and how data mining methods could be used in the brand and service-based industry sectors to implement Industry 4.0.

Big Data technologies are critical to maximizing education intelligence by assisting institutions, administration, educators, and students in improving educational quality, improving the learning experience, developing predictive teaching activity strategies, generating better decisions, and analysing the market. Furthermore, Big Data technologies are being used to evaluate, identify, and anticipate learning tasks, risk factors, and outcomes to improve teaching quality and assure that academic programs are of good quality. According to the report [21], certain educational institutes and authorities have deployed some Big Data concepts to help students transition from traditional to digitally smart education.

Stephanie Moore in 2008 stated that "ethics is a crucial part, despite how difficult it is to address since it is full of ambiguity, opposing opinions, and fuzzy meanings". Individual opinions, attitudes, and preferences affect scientific activity, particularly in terms of developing, producing, and implementing educational software and investigating learning. Our data security and privacy structure lay the groundwork for an appropriate code of behaviour, requiring that all project-developed methods and software, as well as any third-party technology employed, adhere to these principles. As a result, we should apply the relevant concepts to an "ethics by design" methodology.

## VII. CONCLUSION

Based on the foregoing, we suggest that an E-Education system should be implemented in Indian school classes for children to achieve the expected level of learning. After adoption, children's learning goals will improve on the one hand, while organizing course material, teaching, and assessment would be much easier than the other. The method is environmentally friendly and green. As a result, adopting an E-Education system to educate and study would be extremely advantageous to a country such as India. This research review can serve as guides for academics, businesses, and industry professionals interested in using the discussed Big Data methodologies in the sectors of e-business, e-management, e-learning, as well as e-education

This study has highlighted key Big Data ideas that can be used in School Education learning of India for better results and also examined several elements of Big Data in this article. We have conducted a thorough analysis of current privacy and security research findings and accomplishments from both an operational and conceptual standpoint, intending to provide a solid foundation for interested people to solve the difficulties of Big Data in School Education System of India.

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## AUTHOR'S BIOGRAPHY



**Jahangir Kamal** is a Ph.D. Scholar in Information Technology at Jagannath University Jaipur, Rajasthan. He received his master's degree in Information Technology (MSc. IT.) from BGSBU Rajouri, J&K in 2011. He has two paper publications in national and international conferences, and three in different international Journals. His research interests are Big Data, Distributed Computing and Open-Source Technologies.