Adoption and Implementation of E-Governance for Smart Education inWest Bengal

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Abstract: The UN has set Quality Education as one of the 17 global Sustainable Development Goals. In keeping with that, the Ministry of Statistics and Programme Implementation, Govt. of India prepared the National Indicator Frameworkdeveloped in which the government declared a vision to ensure free and equitable education for all boys and girls in thecountry, at pre-primary, primary and secondary schools; besides ensuring access of any and all types of education for both men and women, thus eliminating all gender disparities; build education facilities which are child, disability and gender sensible and also encourage safe and inclusive education. Targeting comprehensive care for India's youth population of 28%, the Right of Children to Free and Compulsory Education (RTE) Act (2009), the National Early Childhood Care and Education Policy (2013), the National Education Policy (2020) have also been developed. Besides,The Integrated Child Development Services (ICDS) Scheme is catering children aged less than six years through a network of 1.38 million Anganwadi Centers (AWCs) across the country offering pre-primary education to about 28.5 million children (2019). Early Childhood Care and Education (ECCE) helped in inclusion of robust educational pedagogywith the curriculum in Anganwadis. The government also vowed to ensure use of information and communication technology (ICT) for pedagogical purpose and also follow such best practices on innovative ICT through research and development. Given the importance of digitalization in the education system, internet access in schools is fast expandingand more than 80% of the teachers have been trained on ICT. The six focus areas of ICT in education programme as emphasized by the UNESCO policy are (i) teacher training, (ii) teaching and learning, (iii) non-formal education, (iv) monitoring and measuring, (v) research and (vi) knowledge sharing. However, the COVID-19 pandemic has already affected the progress as the poorest and vulnerable group of students suffered due to closure of schools, forgetfulness andinattentiveness, child marriage and child labor etc. But at the same time, with schools and workspaces transitioning online due to COVID-19, ICT skills have become critically important. It is noteworthy that, use of ICT under a comprehensiveinitiative of Atma Nirbhar Bharat Abhiyaan 2020 called PM eVidya by the Department of School education, Ministry ofEducation (MoE), particularly during the COVID-19 pandemic have won UNESCO's recognition. This is undoubtedly an encouraging picture for state-of-the-art e-learning technology and the Govt. of India has developed multiple free e- Learning platforms across various branches, such as, Swayam, Diksha etc. as a matter of fact, the e-learning market in India was worth 247m USD in 2016 and grew to 12bn USD in 2020 and it is expected to grow three times in next five years. This study has made an effort to study how e-learning has helped the quality of education and its implementation.

Keywords: E-learning, ICT, Smart Education, E-governance

I. INTRODUCTION

By its Right of Children to Free and Compulsory Education (RTE) Act, 2009 India had already made free and compulsoryeducation up to the age of 14 years a fundamental right of citizens. Besides, technology has taken over our entire life andeducation is no exception to that. Technological advancement has great effect on how learning is imparted by teachers and consumed by students. It is now being accepted that, online method of education is the only method which suits everyone, as a subscriber who can be a student or any user, and s/he does not need to be present at any particular place at any particular time and e-learning gives learner the comfort to learn when and where s/he wants to. Moreover, unlike classroom teaching method, students can access the same lesson as many times as so required on e-governance driven platforms, the contents from e-Learning platforms keep updating regularly, interesting simulations often makes interesting meta-verse for students to enjoy study. With these progress and wider outlooks in India, education has adoptedtechnology, ICT and e-governance to spell out the modernized smart education.

II. BACKGROUND

In India, as per the National Family Health Survey 2019-21 (NFHS-5), 71.5% of adult women & 87.4% adult men are literate. In India, in recent years Quality Education has seen massive growth due to the application of e-governance in this sector. Information and Communication Technologies (ICTs) initiatives helped to provide technology driven smart education. Kofi Annan, the former United Nations secretary general, once pointed that in order to attain the SDG on quality education we must ensure that information and communication technologies unlocks the door of modernized education systems. Modernized education leads to skilled manpower and improved quality of education. Smart Education system makes efficient use of IT technology that takes advantage of Internet-of-Things (IoT) and cloud computing technologies to track and act on multiple components in a smart education system.

Now, it is widely believedthat, the Internet and broadband connectivity have a tremendous potential to solve the pressing challenge of educating the whole nation. However, there are challenges like low internet coverage and widespread school dropouts. As per Telecom Regulatory Authority of India (TRAI), around 84 crores out of estimated 140 crores of Indian population that is 60% of Indian population possess internet connections presently. Also, according to National Statistical Office (NSO),there is one school dropout of every eight students. But amidst challenges, still under Digital India programs like PM eVidya and Digital Infrastructure for Knowledge Sharing (DIKSHA) portal and mobile app created by Ministry of Education, with a goal to spread smart education, more than 502 crores digital learning sessions could be hold and also 4.6 crores teachers have completed teaching courses online till date as per India Report Digital Education 2021 by Ministry of Education. Already, e-Learning is becoming fundamental base for effective application of Information and Communication Technologies (ICTs) in the teaching and learning processes. It is creating a rich digital environment withhelp of computers and Internet applications which enable the learners to access the learning resources anytime and anywhere and to achieve mutual platform of interaction with educators. Rapid advancement in Information and Communication Technologies (ICTs) has revolutionized every aspect of human life and even education. Recent developments in these technologies have provided foundations for Internet of Things (IoT) in education. The IoT is helping in building smart education system with the help of big data and cloud computing which enables students to access ICT materials through laptops, tablets and smartphones. The use of IoT in education allows teachers and studentsto interact remotely via a webcam and the internet. This way, the data exchanged between the network members on a e-Learning platform can be stored using block chain technology in a transparent and secured way and thus it helps learnersand academic institutions to record academic results and guarantee results through a secure network. Block chain technology is also being used now to store academic history which becomes useful for employers in future to employ a student.

III. PURPOSE

The technology is widely used in today's e-Learning platforms or smartphone-based learning apps. The purpose of this study is to examine how and to what extent e-governance enhances the quality education and encourage e-Learning. Also,it investigates upon how smart education fosters to build up learned manpower for technology implementation.

IV. METHODOLOGY

The study analyses factors affecting usage of Information technology, using of Information and Communication Technologies (ICTs) and practice of e-Learning in educational sector. This study is conducted following both qualitativeand quantitative research approach based on primary and secondary data. To validate research data sample survey methodis used in this study. Primary data has been collected through comprehensive questionnaire administered to officials of State Education department in West Bengal. Officials of both the School Education and Higher Education Department have been surveyed. Questionnaire has been applied to collect data from the respondents through personal interview. This is a cross-sectional Research considering data collected only from West Bengal and from selected institutions in thestate government sector and for a specific time period between 2006 and 2016. The basis behind the selection of a singlestate rather than multiple states of India was to eliminate the macro-environmental diversity that exists among states dueto geographical, social and cultural differences. Moreover, the collection of data from a fairly homogeneous environmentis expected to further facilitate the control of plausible impacts arising from uncontrollable external variables. The study includes studying the contemporary situation as a result of E-governance implemented in education sector as selected bythe Researcher through convenience sampling. 74 Sample populations, who are responsible in implementing smart education and administering ICTs for e-Learning, have been selected from the teaching and administrative officials of the Education department. Personal Interviews and Survey through Questionnaires with the officials at this level has beenthe primary source of data in the mentioned departments. The response to the questions has been rated on 7-points Likerscale from lowest rating to highest rating. Here, the from among the set of respondents of the sample size, person respondents have been grouped in two separate groups based upon the serial numbers in which they have been surveyedby this researcher. The people respondents who have been surveyed as first, third, fifth in the serial have been grouped in one section. Again, those people respondents who have been surveyed in second, fourth, sixth, eighth and so on in linehave been grouped in another group. The group consisting first, third, fifth, seventh and so on persons have been identified as the "odd respondents' group" and the group consisting the second, fourth, sixth, eighth and so on persons is named the"even respondents' group". These two groups of people's responses thus have been separately grouped and statistically calculated to collect separate mean values and separate standard deviations values for comparison and finding the Cranach's alpha and Pearson's Correlation analysis. Considering Cranach's Alpha's max value is 1, as per thumb-rule, more than 0.7 reliability has been achieved. The Pearson value of r convincingly showed that there is either positive values (as one variable increases, the other also increases) or negative values (when one increases, the other variable decreases) of the linear relationship between two research questions at any point of time. The two sets responses collectedfrom odd numbers of respondents (viz. the first, the third, the fifth, the seventh person and so on) and even numbered respondents (viz. the second, the fourth, the sixth and so on) and correlation between them calculated with CORREL function in MS Excel and the obtained Correlation Coeff is 0.836215. As

per S-B prediction of reliability, if the result of correlation is between (0.8) to (1), it indicates high Internal Consistency, and in this case the value obtained for S–B correlation is 0.9108. Over and above, Guttman's reliability believes to be another pretty good measure of reliability has also been carried out and the Guttman Reliability, G-R coeff is found to be 0.888. Further the researcher used the weighted least squares method (WLSMV) method for confirmatory factor analysis (CFA) model of the ordinal dataset which are non-normal and continuous. The responses of odd and even values are separately calculated for mean and standard deviation values and then the two sample or unpaired t-test have been carried out for each of questions to calculate the p-value. The p-value obtained for each of X1 to X14 are observed to be less than the significance level. Secondary data collected from different published materials like books, articles, reports by academics and regular internet surfing has been maintained to serve the purpose of the study. Study findings reveal that in spite of having some limitations, Information and Communication Technologies (ICTs) are contributing a lot to provide quality education and helps to develop human skills making them fit for the competitive global market of providing smart education through e-Learning.

TABLE I SUMMARY OF RESPONDENTS

Survey inferences	Agree	Neutral	Don't Agree
Idea about e-governance	93	5	2
E-governance is in popular use	90	9	1
Regularly new projects are taken up	87	12	1
There are increasing number of e-Learning App	65	32	3
E-Learning Apps are popular	50	46	4
E-Learning platforms are safe for educating	49	48	3
E-Learning is faster way of learning	65	34	1
E-Learning improves skills	53	44	3
Recommend ICT for transformation of a student	49	49	2

V.   FINDINGS

In pursuance with the Fourth prioritized Sustainable Development Goal of Quality Education for all as determined by the United Nations, the Ministry of Education of the Govt. of India in its implementation plan of the National Education Policy, NEP 2020 has included 'Students' and 'Teachers' Holistic Advancement through Quality Education (SARTHAQ).SARTHAQ is an implementation plan to achieve NEP themes such as Early Childhood Care and Education, Foundational Literacy and Numeracy, Curtailing Dropout Rates and Ensuring Universal Access to Education at All Levels, Curriculum and Pedagogy, Teachers, Equitable and Inclusive Education, Efficient Resourcing and Effective Governance, Regulation and Accreditation of School Education, Teacher Education, Reimagining Vocational Education, Adult Education, Technology - Use and Integration, Financing: Ensuring Affordable and Quality Education for All. To address the challenge of remote learning and building of digital education platform in India, the Ministry of Human Resources Development (MHRD) has taken up comprehensive PMeVidya envisaging that it will benefit 25 crore school going students. Digital Infrastructure for Knowledge Sharing (DIKSHA) portal reports that, DIKSHA contents are widely used by States and West Bengal already held 65 thousand+ such digital learning sessions. 60 crores+ books have been digitized and QR coded energized textbooks have been made available in 18+ languages in schools.

Now, as per reports of Unified District Information System for Education (UDISE), there are 15 lakh+ schools in India till 2019-20. In West Bengal, there are 63.5 thousand+ schools as per banglarshiksha portal data. The national figure for total teachers in schools stands at 85 lakh+ and in West Bengal it is 4 lakh+. The government has extended funds amounting Rs.1000 crore in 2020-21 and Rs.950 crore in 2021-22, toward smart education using e-governance under Samagra Shiksha scheme. The cabinet committee on economic affairs approved the extension of Samagra Shiksha Abhiyan (SSA) 2.0 for school education. For this scheme, a financial outlay of Rs 2, 94,283.04 crores was made to implementation from the period April 1, 2021, to March 31, 2026. The Centre's share is Rs 1, 85,398.32 crore. Till date there are 65 thousand+ ICT labs and 29 thousand+ smart classrooms in India. However, in 2021-22, the government has given approvals to 42,311 digital classrooms and another 10,778 ICT labs all over India giving boost to end the digital divide. Also TRAI data shows that only 6% of Indians possess internet connections presently in India.

Fig. 1 Challenges of e-learning in India

Now, in order to spread smart education, getting all schools of India connected to the Internet is indeed a far-fetched goal requiring multiple stakeholders' collaboration like, (i) funding in terms of grants, utilization certificates, approval processes, feedback mechanism etc., (ii) infrastructure in terms of identifying location or remoteness of schools, the challenge of connectivity, and how a connected school can serve increasing demand of education. Furthermore, it is important to analyze, (iii) various technologies and funding mechanisms for affordable and safe Internet access in remotest of schools. And lastly, (IV) human resource in terms of learned manpower who can help empower students, teachers and entire communities once connectivity has been established and turn the school into a digital hub of prosperity.As per National Association of Software and Service Companies (NASSCOM), in 2021, 30% to 32% of Indian workforce has knowledge of IT. If a bigger share of this learned workforce helps knowledge building of the education sector that will greatly benefit this sector.

VI. CONCLUSION

There is a direct proportional relationship between e-governance and e-learning. Also in today's technology savvy world,quality education is only possible with smart education. Study findings reveal that in spite of having some limitations, Information and Communication Technologies (ICTs) are contributing a lot to provide quality education and helps to develop human skills making them fit for the competitive global market of providing smart education through e-Learning.To add to this, the Indian economy is predicting 170 crore+ smart users in India by 2026 which will definitely help the spread of e-learning.

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