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Mapping of major ICT initiatives in school education of India: an overview

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Abstract

The shifting of teacher-centric education system (primitive) to student-centered education system (modern) invites many changes that are directly or indirectly affects the scenario of education worldwide. In India, lots of changes have been made in school education system as far as ICT tools and techniques are concerned. Many applications and devices have been designed and produced to fulfil the needs of not only teachers and students but also parents and other stakeholders for the betterment of the society as a whole. The ICT initiatives taken by Government of India are effective in disseminating information to its clientele. This paper presents details of five ICT initiatives by the central and state government of India. These initiatives are mapped in this paper at regional, state or national level. An overview of these ICT initiatives is presented and systematic mapping is done to show the effectiveness and exhaustiveness of these initiatives.

Keywords

ICT Initiatives, School Education, Information Resources, India.

Introduction & Literature Review

Education is indispensable for a growing society. It has to continuously evolve to fulfil the needs of fast-changing world (Serdyukov, 2017). School education is the most important phase in the life of an individual. It helps in shaping the character and career of the individual. It is regarded as the foremost fountain of knowledge for the students. It gives diverse opportunities for them to understand fundamentals of different disciplines of knowledge that contributes to the cultivation of thought process (Sharma, 2019). In India, education system in ancient times is more or less based on closer relationship between students and teachers i.e. gurukul system. This system is basically teacher-centered learning approach where teacher decides the curriculum, timing of the course and all other aspects of the education. Student has to stay with the teacher and serve him to obtain the education (Kumar, 2011; Emaliana, 2017). The students had to live with the same hospitality inside the gurukul campus regardless of the nature and status of their family from where they come. The pedagogy system of education in this century is influenced by the advancement of Information and Communication Technology (ICT) tools and techniques. In fact, ICT tools does not only influence the pedagogical system but also improves the quality of teaching and learning environment and benefit both teachers and students (Cardellino & Leiringer, 2014).

There are numerous research works has been done on the ICT in school education. Yuen, Law and Wong (2003) surveyed top 18 schools in terms of experience in using ICT in education in

Hong Kong. They worked on two aspects of ICT namely ICT usage in the classroom and ICT implementation at the school level. They carried this study in the light of three models – technological adoption model, catalytic integration model and cultural innovation model. Ekberg and Gao (2017) investigated the challenges in using ICT in secondary schools from perspective of teachers in Sweden. The important challenges concluded by this study were challenges on teaching and teaching preparation, challenges on attitude and knowledge of ICT, challenges on ICT training and challenges on support from school leadership. Robertson et al (2005) conducted study on 65 school-based personnel (Principal, Teachers, ICT-coordinator, Technician) in 50 Tasmanian schools. The study draws two major themes - transformation of teaching and learning practice and creation of communities of practice. The study concluded that discussion with stakeholders is more important than ICT technology. Teachers use ICT in imparting different dimensions to their teaching abilities. On the other hand, students can access information resources from anywhere and in less time. Innovations in ICT in education has greatly reformed the students' capacities for critical thinking, self-learning and communication ability (Yuen, Law & Wong, 2003). The opinions of children library about their perception of a children library is evaluated by Sharma (2018), in which it was found that children like to implement ICT tools and establish computer lab with internet facility in their library.

Objective

The objective of the paper is to highlight and map the ICT initiatives in school education provided by Indian state and central government. The paper also aims to understand the scenario of school education as far as ICT tools and techniques in schools are concerned.

Methodology

Secondary data is obtained from official websites of the concerned government departments. The data is represented by using graphs and chart and discussions are made on the basis of this data. As the paper also aims to highlight the ICT initiatives in school education, therefore basic functionality of these initiatives is also discussed in detail.

ePathshala: Pathshala is a Hindi word which means 'school'. ePathshala creates a virtual environment where a student can feel a school library like environment and can get easy access to study materials sitting anywhere on the globe without any restrictions. "Learning on the go", written on its logo, reflects the prompt service given by ePathshala. It is developed by the Central Institute of Educational Technology (CIET), National Council of Educational Research and Training (NCERT) and hosted by National Informatics Centre (NIC). It is a platform that enables access to e-resources specifically eTextbooks. It has separate modules for all stakeholders such as students, teachers, educators as well as parents.

- a. eTextbooks: All the NCERT textbooks are digitized in English, Hindi and Urdu languages. These eTextbooks will also be available in local languages too. Work on more native languages is in progress. These eBooks are accessible in a flipbook manner

and it gives a feeling as of reading a real book. These eBooks in digital form are arranged in three tiers, namely first class-wise, then subject-wise and finally title wise (in different languages). These eBooks can be downloaded in portable document format (pdf) as chapter wise or as complete book in one go.

- b. **Supplementary books:** All the NCERT supplementary books are digitized in two series Barkha and Versha series in different English and Indian native languages. It provides access to all graded materials apart from textbooks.
- c. **Events:** It provides a platform to participate in various contests, festivals, workshops, and exhibitions at the national level for the students as well as teachers.
- d. **eResources:** It is an online portal that provides access to study materials in an audio and visual format. The resources can be accessed in English, Hindi and Urdu languages. These resources include learning materials for all educational levels such as primary, upper primary, secondary and senior secondary.
- e. **Teaching instructions:** This portal provides access to teaching manuals and guides in digital form. It has different modules for different education levels such as pre-primary/ECCE, primary, upper primary, elementary, secondary and senior secondary.
- f. **Learning outcomes:** This platform helps children in achieving their learning outcomes. Its resources include learning indicators and outcomes from classes 1 to 8 in their subjects.
- g. **Periodicals and journals:** It provides access to periodicals and journals relevant to the school education that aids teachers in their teaching. Teachers can also contribute to periodicals and journals.
- h. **Curricular resources:** This platform provides access to various policy documents, committee reports, National Curriculum Frameworks (NCFs), syllabus and other resources that are helpful to support children learning and education.



Figure 1 – ePathshala

(Source: <http://epathshala.nic.in/>)

| More information on ePathshala | | |
|--------------------------------|---|-------------------------------|
| 1 | <i>Collection</i> — Epubs — Flipbooks — Audio-visual resources | 698 504 3,455 |
| 2 | <i>Language available</i> | Hindi English Urdu |
| 3 | <i>QR-code</i> | Yes |
| 4 | <i>Visitors</i> | 4,06,95,355 |
| 5 | <i>Youtube views</i> | 2,50,01,195 |
| 6 | <i>Downloads</i> — Google play store — Apple store — Windows store | 19,40,000 98,896 53,893 |
| 7 | <i>Ratings</i> — Google play store — Apple store — Windows store | 4.5 3 4.5 |

Table 1- More information on ePathshala

(Source : <http://www.ncert.nic.in/DetailedePathshala.pdf>)

Shaala Siddhi: Shaala Siddhi is an ICT based platform where school evaluation is done for its improvement. It is also known as the National Programme on School Standards and Evaluation (NPSSE). NPSSE has been initiated by the National University of Educational Planning and Administration (NUEPA) under the guidance of the Ministry of Human Resource Department, Government of India. The necessity of school improvement programmes is highlighted long back by the Education Commission in the year 1964-65, which states that,

“In view of the great need to improve standards of education at the school stage, we recommend that a nationwide programme of school improvement should be developed in which conditions will be created for each school to strive continually to achieve the best results of which it is capable”- Education Commission, 1964-65


To fulfill the above aim, the following objectives are laid down by NPSSE. These objectives exhaustively fulfill the framework on school improvement by the method of its evaluation.

Following are the four major objectives of NPSSE:

1. A technical outclass conceptual framework along with the methodology, instrument and the process of the school evaluation system is to be developed to fulfill the varying diversity of Indian schools.
2. Setting up an institutional mechanism and human resource for contextualizing the school evaluation and practices across different states.
3. For improving the school system in a sustainable and continuous manner and increase its capacity, school evaluation programs must be institutionalized.
4. Developing a system that should analyze school evaluation reports and initiate policy interventions based on school-specific needs.

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**NATIONAL PROGRAMME ON
SCHOOL STANDARDS AND
EVALUATION (NPSSE)**
शाला सिद्धि
Shaala Siddhi

Evaluation for Improvement

'School Evaluation' as the means and 'School Improvement' as the goal

The need for effective schools and improving school performance is increasingly felt in the Indian education system to provide quality education for all children. The quality initiatives in school education sector, thus, necessitate focusing on school, its performance and improvement. [Read More...](#)



| | | | |
|----------------------|-----------------------------|---|-----------------------------|
| Information Brochure | NPSSE: A Programme Document | School Standards and Evaluation Framework | School Evaluation Dashboard |
| Choose Languages | Choose Languages | Choose Languages | Hindi |

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Latest Updates

Figure 2 - Shaala Sidhi
(Source: <http://shaalasiddhi.niepa.ac.in/>)

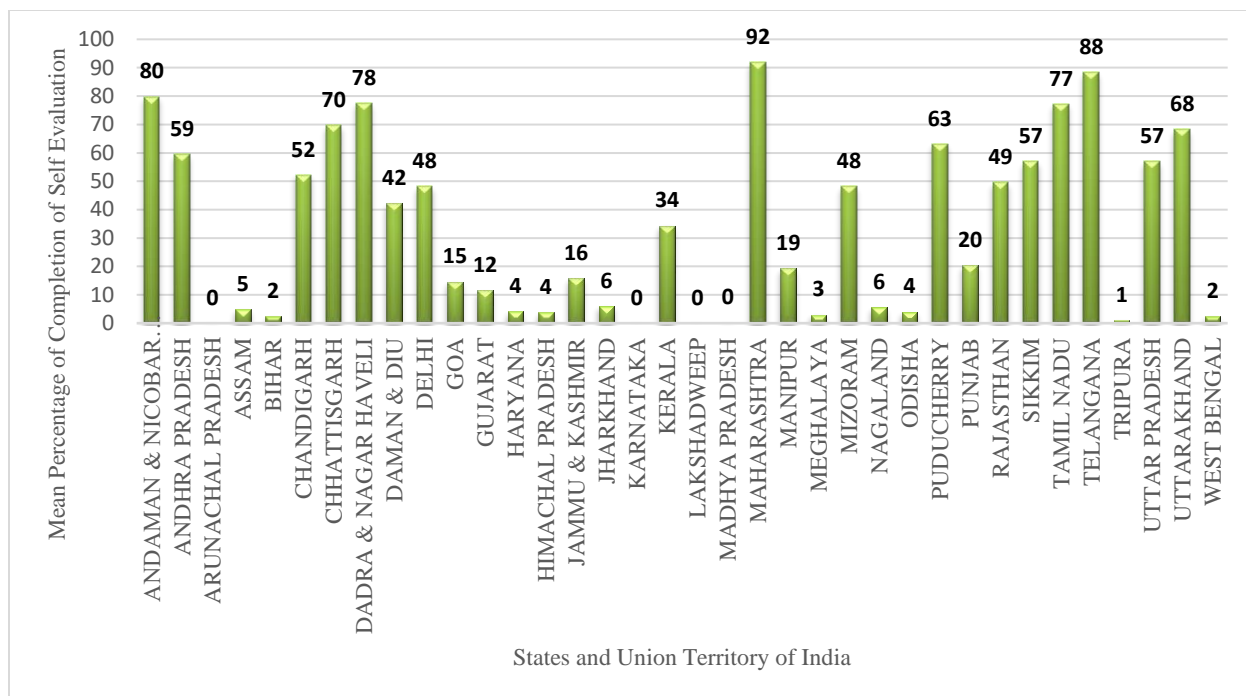
| Sl. No. | State Name | No. of Schools Available | Self Evaluation | | | Self- Evaluation Completi on % |
|---------|------------------------------|--------------------------------|-----------------|-----------------|----------------|---|
| | | | Complete d | In- progress | Not Started | |
| 1 | Maharashtra | 109141 | 100318 | 5080 | 3743 | 91.92 |
| 2 | Telangana | 43134 | 38063 | 1821 | 3250 | 88.24 |
| 3 | Andaman & Nicobar Islands | 418 | 333 | 0 | 85 | 79.67 |
| 4 | Dadra & Nagar Haveli | 347 | 269 | 22 | 56 | 77.52 |
| 5 | Tamil Nadu | 58275 | 44977 | 660 | 12638 | 77.18 |
| 6 | Chhattisgarh | 54515 | 38006 | 10842 | 5667 | 69.72 |
| 7 | Uttarakhand | 24424 | 16671 | 1733 | 6020 | 68.26 |
| 8 | Puducherry | 742 | 468 | 1 | 273 | 63.07 |
| 9 | Andhra Pradesh | 64051 | 38027 | 3588 | 22436 | 59.37 |
| 10 | Sikkim | 1318 | 752 | 21 | 545 | 57.06 |
| 11 | Uttar Pradesh | 268621 | 152924 | 6415 | 109282 | 56.93 |
| 12 | Chandigarh | 207 | 108 | 4 | 95 | 52.17 |
| 13 | Rajasthan | 106670 | 52777 | 5290 | 48603 | 49.48 |

| | | | | | | |
|----|-------------------|--------|------|-------|--------|-------|
| 14 | Delhi | 5799 | 2795 | 177 | 2827 | 48.2 |
| 15 | Mizoram | 3959 | 1907 | 213 | 1839 | 48.17 |
| 16 | Daman & Diu | 145 | 61 | 43 | 41 | 42.07 |
| 17 | Kerala | 17263 | 5911 | 3363 | 7989 | 34.24 |
| 18 | Punjab | 29266 | 5948 | 2598 | 20720 | 20.32 |
| 19 | Manipur | 5052 | 979 | 0 | 4073 | 19.38 |
| 20 | Jammu & Kashmir | 29435 | 4617 | 2107 | 22711 | 15.69 |
| 21 | Goa | 1554 | 227 | 152 | 1175 | 14.61 |
| 22 | Gujarat | 53878 | 6220 | 191 | 47467 | 11.54 |
| 23 | Jharkhand | 48869 | 2953 | 1529 | 44387 | 6.04 |
| 24 | Nagaland | 2875 | 163 | 129 | 2583 | 5.67 |
| 25 | Assam | 71765 | 3523 | 1357 | 66885 | 4.91 |
| 26 | Haryana | 23193 | 954 | 2079 | 20160 | 4.11 |
| 27 | Odisha | 70803 | 2831 | 1156 | 66816 | 4.00 |
| 28 | Himachal Pradesh | 18386 | 703 | 764 | 16919 | 3.82 |
| 29 | Meghalaya | 14899 | 432 | 135 | 14332 | 2.90 |
| 30 | Bihar | 85873 | 1963 | 388 | 83522 | 2.29 |
| 31 | West Bengal | 95734 | 2177 | 1570 | 91987 | 2.27 |
| 32 | Tripura | 5057 | 48 | 121 | 4888 | 0.95 |
| 33 | Madhya Pradesh | 154238 | 282 | 22878 | 131078 | 0.18 |
| 34 | Arunachal Pradesh | 4433 | 1 | 3 | 4429 | 0.02 |
| 35 | Karnataka | 76975 | 0 | 2 | 76973 | 0.00 |
| 36 | Lakshadweep | 45 | 0 | 4 | 41 | 0.00 |

Table 2 - All India Data Status of Self Evaluation Completion by Shaala Sidhi for Academic Year 2016-18

(Source:

<http://shaalasiddhi.niepa.ac.in/shaalasiddhi/Reports/DataStatusReportForPublic?AcademicYearId=0>)



Graph 1 - All India Data Status of Mean Percentage of Completion of Self Evaluation of Schools by Shaala Sidhi for Academic Year 2016-18

The mean percentage of completion of self-evaluation by Shaala Sidhi in Indian schools for the academic year 2016-18 was 32.83 %. However, the mean percentage for states was 28.24 % and the union territory was 51.85 %. It means that more than half schools in union territory had completed self-evaluation and slightly more than one-fourth schools in states had completed self-evaluation by Shaala Sidhi.

Shala Darpan: Shala Darpan is an ICT initiative by MHRD, Government of India to provide school information services to the Government and Government-aided schools of the country. School information services include profile management of the school as well as student, student attendance, employee information, SMS alerts for Parents, etc. Initially, it was meant for Kendriya Vidyalayas but through National Informatics Centre Services Inc. (NICSI), it is now implemented in different states of the country. Gujarat, Rajasthan, Madhya Pradesh, and Tamil Nadu currently use the software of Shala Darpan for their government-aided schools.

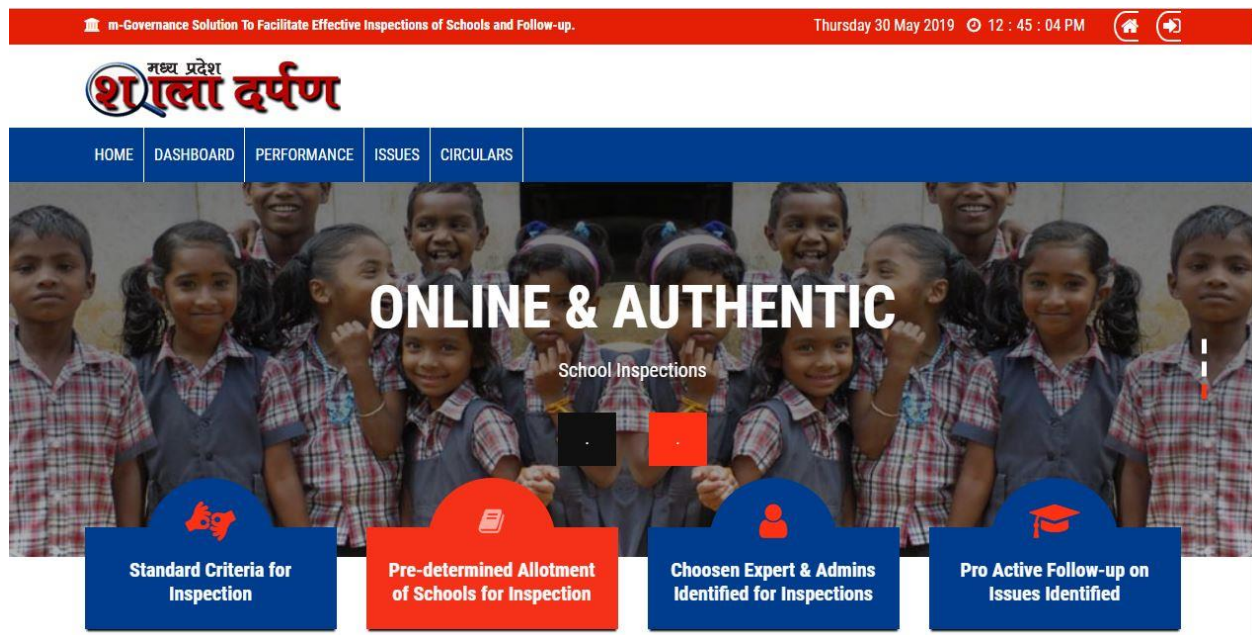


Figure 3- Shala Darpan
(Source: <http://darpan.kvs.gov.in/shaaladarpan/>)

Saransh Portal: Saransh Portal is a decision support system (DSS) developed by the Central Board of Secondary Education (CBSE) that helps in coordinating students, teachers and parents to look upon the performance of the student. It is a comprehensive tool to analyze and self-review CBSE affiliated schools. This platform helps in increasing the interaction between school and parents. It is a data-driven system that assists parents as well as school to make the best decision for their children's future. The mobile app of Saransh Portal was launched in November 2015. Schools, parents as well as the public can use this portal. School uses this portal to view, monitor and compare the subject-wise performance of the student within the state, region or nation. They also use this portal to generate online report card and send messages to the parent regarding test results, attendance, student activities, etc. Parents use this portal to view and compare their ward's performance within the state region or nation. They can send messages to the school administration regarding any query and can view their ward's report card. This portal becomes available to them when their kids study in class 9 and above. Public use this portal for comparing subject wise and overall result of the Board within the state, region or nation. Saransh Portal allows user access, data analysis, public statistics, school's past performance, school's performance, student performance, print mark statements, data insertion, security over the app and communication between parents and schools.

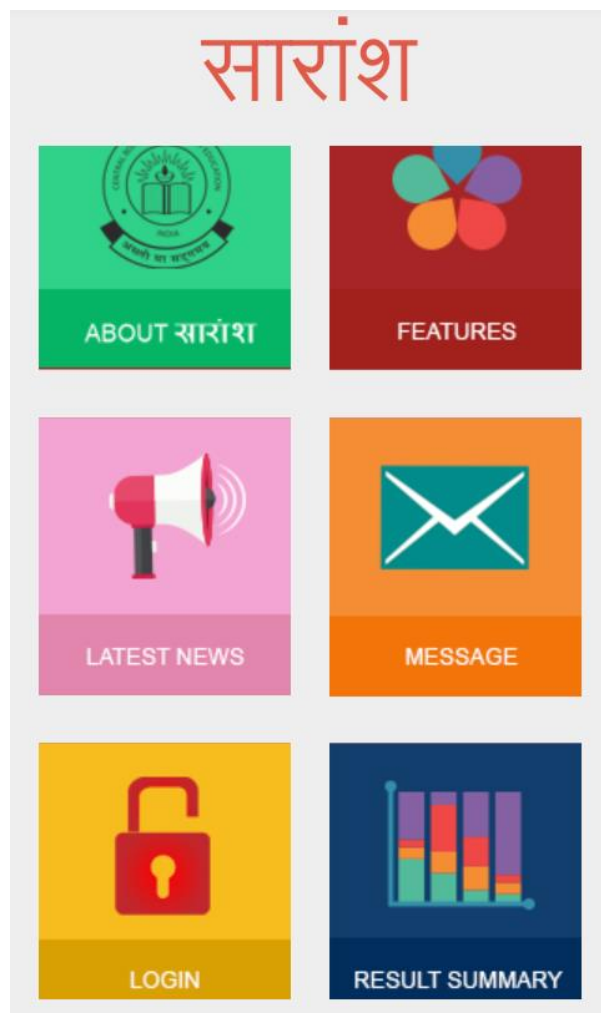
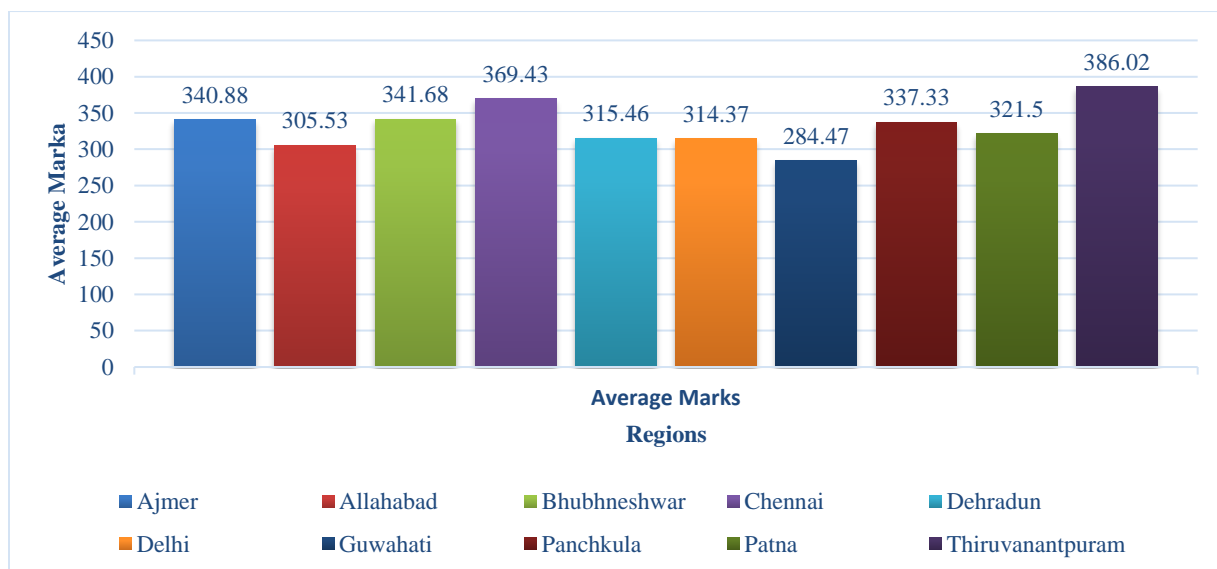
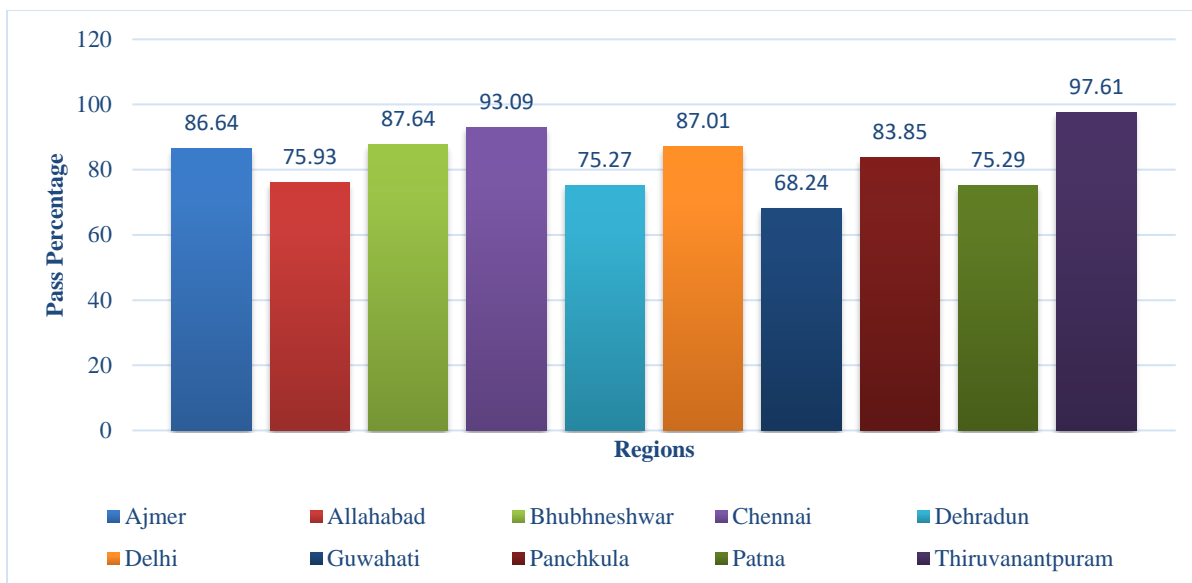


Figure 4- Saransh Portal (Mobile View)
(Source: <https://saransh.digitallocker.gov.in/>)



Graph 2 - Comparative Study of Class XII, 2015-16 Region wise
(Source : <https://saransh.digitallocker.gov.in/public/statistics>)



Graph 3 - Comparative Study of Class XII, 2015-16 Region wise

(Source : <https://saransh.digitallocker.gov.in/public/statistics>)

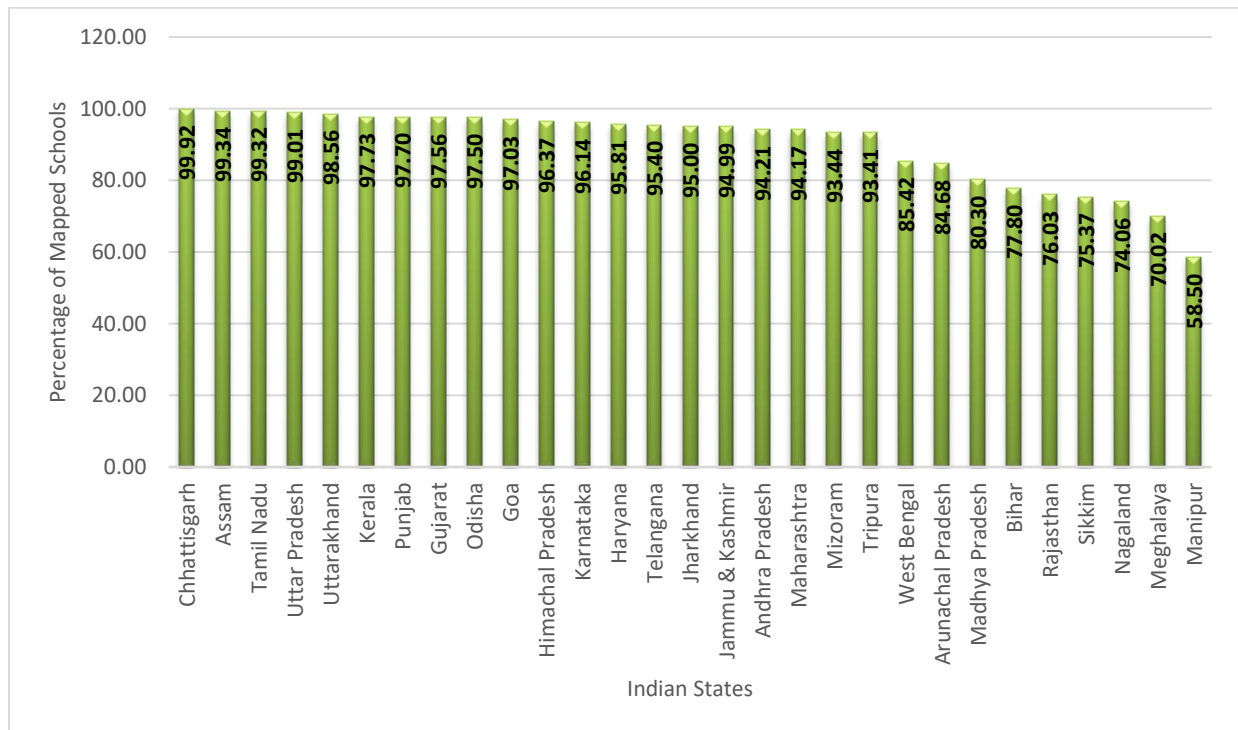
School GIS: Web-Based School GIS application is an initiative of the Department of School Education and Literacy, Ministry of Human Resources Department, Government of India for seamless visualization of school locations across the country. The geographic location of schools collected by the various School Education Departments of the states has been collated and mapped on GIS Platform established by National Informatics Centre. This initiative is adapted to high-resolution satellite images and street maps that provide better picture of the topography of concerned region. The scope of this application may go upto village level which is more advanced than the previous technology used in this process. The previous technology records images upto town level only. It is implemented in 2010 in Gujarat under Sarva Siksha Abhiyan. Major initiatives taken by this application include actual location of the school, integration of geo-spatial database with departmental school data, mapping of schools etc.

State-wise School Mapping

| S.N. | State | Mapped | Total | % |
|------|---------------|--------|--------|-------|
| 1 | Chhattisgarh | 53738 | 53781 | 99.92 |
| 2 | Assam | 70571 | 71042 | 99.34 |
| 3 | Tamil Nadu | 57192 | 57583 | 99.32 |
| 4 | Uttar Pradesh | 253438 | 255969 | 99.01 |
| 5 | Uttarakhand | 23681 | 24026 | 98.56 |
| 6 | Kerala | 16742 | 17130 | 97.73 |
| 7 | Punjab | 28322 | 28988 | 97.70 |
| 8 | Gujarat | 51141 | 52422 | 97.56 |

| | | | | |
|----|-------------------|--------|--------|-------|
| 9 | Odisha | 68539 | 70300 | 97.50 |
| 10 | Goa | 1535 | 1582 | 97.03 |
| 11 | Himachal Pradesh | 17385 | 18039 | 96.37 |
| 12 | Karnataka | 72576 | 75489 | 96.14 |
| 13 | Haryana | 21380 | 22315 | 95.81 |
| 14 | Telangana | 40669 | 42632 | 95.40 |
| 15 | Jharkhand | 46101 | 48528 | 95.00 |
| 16 | Jammu & Kashmir | 27342 | 28785 | 94.99 |
| 17 | Andhra Pradesh | 59069 | 62702 | 94.21 |
| 18 | Maharashtra | 101350 | 107624 | 94.17 |
| 19 | Mizoram | 3574 | 3825 | 93.44 |
| 20 | Tripura | 4525 | 4844 | 93.41 |
| 21 | West Bengal | 81779 | 95736 | 85.42 |
| 22 | Arunachal Pradesh | 3427 | 4047 | 84.68 |
| 23 | Madhya Pradesh | 121523 | 151341 | 80.30 |
| 24 | Bihar | 65535 | 84236 | 77.80 |
| 25 | Rajasthan | 115080 | 151354 | 76.03 |
| 26 | Sikkim | 964 | 1279 | 75.37 |
| 27 | Nagaland | 2093 | 2826 | 74.06 |
| 28 | Meghalaya | 10162 | 14514 | 70.02 |
| 29 | Manipur | 2921 | 4993 | 58.50 |

Table 3 – State Wise School Mapping
(Source : <https://schoolgis.nic.in/>)

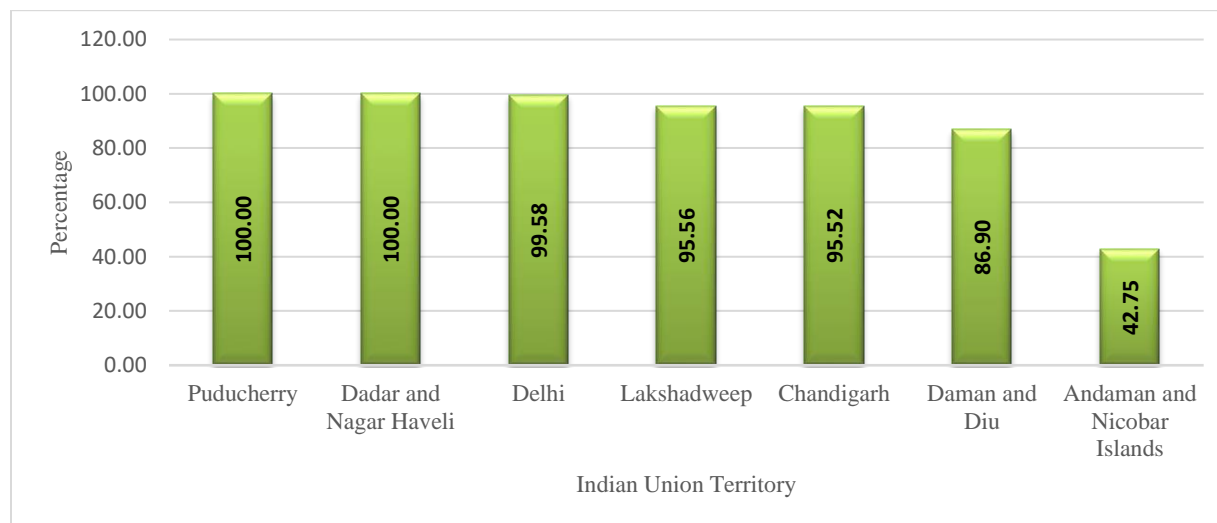


Graph 4 – State-wise School Mapping

Union Territory wise School Mapping

| S.N. | Union Territories | Mapped | Total | % |
|------|-----------------------------|--------|-------|--------|
| 1 | Puducherry | 731 | 731 | 100.00 |
| 2 | Dadar and Nagar Haveli | 347 | 347 | 100.00 |
| 3 | Delhi | 5731 | 5755 | 99.58 |
| 4 | Lakshadweep | 43 | 45 | 95.56 |
| 5 | Chandigarh | 192 | 201 | 95.52 |
| 6 | Daman and Diu | 126 | 145 | 86.90 |
| 7 | Andaman and Nicobar Islands | 177 | 414 | 42.75 |

Table 4 – Union Territory wise School Mapping
(Source : <https://schoolgis.nic.in/>)



Graph 5 – Union Territory wise School Mapping

Summary of ICT Initiatives

| S. N. | Name of the Initiative | Provided by/developed by/hosted at | Basic Functions |
|-------|------------------------|--|---|
| 1 | ePathshala | Joint initiative of Central Institute of Educational Technology (CIET), National Council of Educational Research and Training (NCERT) and hosted by National Informatics Centre (NIC) and Department of School Education and Literacy, Ministry of Human Resources Department, Government of India | It provides easy access to all kinds of study materials to anyone sitting anywhere on the globe without any restrictions. |
| 2 | Shaala Siddhi | National University of Educational Planning and Administration (NUEPA) under the guidance of the Ministry of Human Resource Department, Government of India. | It provides ICT based platform where school evaluation is done for its improvement. |
| 3 | Shala Darpan | Department of School Education and Literacy, Ministry of Human Resources Department, Government of India | It provides school information services that includes profile management of the school as well as student, student attendance, employee |

| | | | |
|---|----------------|--|--|
| | | | information, SMS alerts for Parents, etc. |
| 4 | Saransh Portal | Central Board of Secondary Education (CBSE) | It helps in coordinating students, teachers and parents to look upon the performance of the student. This platform helps in increasing the interaction between school and parents. |
| 5 | School GIS | Department of School Education and Literacy, Ministry of Human Resources Department, Government of India | It helps in providing information of about location of school in each states upto village level which includes habitation and other basic GIS functionality. |

Table 5 – Summary of ICT Initiatives

Conclusion

The ICT initiatives taken by state and central government of India are a good example of ICT implementation in school education system. These initiatives provided easy and free access to information not only to the students but also to teachers, parents, educators and all other stakeholders to education. Now, any person can access and download information regarding study material, textbooks and other miscellaneous books related to their course curriculum. Nevertheless, there is always some scope for improvement in the services provided by these initiatives. Furthermore, these initiatives helped in improving the ICT infrastructure and standard of India. Future work may include the evaluation of each of these initiatives in any region of the country.

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