FINDINGS REPORT

IMPACT ASSESSMENT

of Focused Development Program (FDP) P0487 of HDFC Bank CSR

NGO Partner: Society for Action in Community Health (SACH)

Project Location: Ludhiana, Punjab

Submitted by:

MODEL

MODEL Resource Services Private Limited

Headquarter: 53/C, Garcha Road, Kolkata – 700 019

Website: http://www.modelresource.in/

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EXECUTIVE SUMMARY

About the FDP: This FDP project of HDFC Bank CSR was focused on 'ensuring quality education for all' with the program goal to improve the school infrastructure, educational aides and facilities to provide the rural communities with better educational structures and to improve the footfall and attendance rates in these Government schools as also reduce the dropout rate.

The project was implemented between December 2021 and July 2022 in 21 government schools in 5 blocks of Ludhiana by *Society for Action in Community Health (SACH)*, the NGO supported by HDFC Bank.

About the Impact Assessment: The present study was commissioned to conduct an Impact Assessment of the FDP project P0487 in Ludhiana. The objective of the Assessment was to assess what positive changes has the project brought in the quality of education imparted through these schools along with changes in student educational outcomes. The Assessment also sought to evaluate the efficacy, effectiveness of the project interventions and sustainability of the project's outcomes. A *cross-sectional mixed-method approach* was followed for this study. The coverage of the project was across 21 (20 initially + 1 additionally) government schools across 5 blocks of Ludhiana, Punjab. For the purpose of the Impact Assessment, all 5 blocks were selected for sampling. Within them, number of sample schools to be covered was determined as 50% of the total universe of 21 schools – that is 11 schools. Smart class installation, being one of the core areas of intervention, it was ensured that all schools having that intervention be taken up for the survey. Thus, of the 11 sampled schools, selection of the 9 schools having smart classrooms was done purposively while 2 other schools were chosen randomly. Data collection methods included an Observation Checklist for all 11 sampled schools; structured quantitative interviews with 220 students and 22 Key Informant Interview (KIIs) with teachers/ principals. Sample size was achieved across all data collection methods. Fieldwork for the study was done 11th to 16th December, 2023. The study used the OECD DAC criteria as an analytical framework for assessing the overall impact of the FDP.

Key Study Findings:

CLASSROOM INFRASTRUCTURE

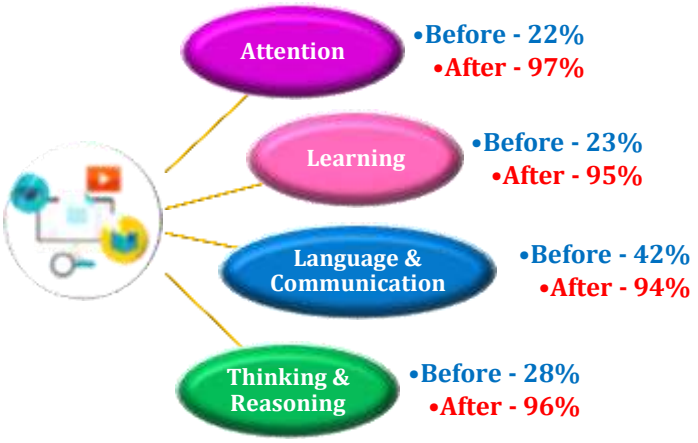
During the survey, the condition of the classroom was observed using a three-point scale – out of 10 marks poor (0-3 marks), Fair (4-6 marks), and Good (more than 7 marks). Of the 17 classrooms observed across 6 schools where the refurbishment or renovation work was reported to be undertaken, half of the classrooms were observed to be in "good" condition and the rest were found in "fair" condition. Students from these schools (N=120) liked that the walls of the classrooms were clean and well-decorated now post repair work (94%), have a proper and a greater number of benches now (91%), are more ventilated now (56%), and more spacious now (25%). All students also perceived that these improvements in their classroom had also helped them to pay more attention in class. These findings resonated with teachers in terms of the good and neat looks of classrooms due to renovation and it drew more attention of students in the classroom. They also felt that the government grants always fell short of the school requirements, and such initiatives (HDFC/SACH project) are useful to meet the requirements further.

SMART CLASSROOM

All the 9 smart classes installed under the project were functional with a smart digital board and digital course content classes 8-12. Largely **students** covered from these 9 schools preferred a smart classroom to a general classroom. Top of the mind reason for preferring smart classroom was attributed by students

to it being more interesting (88%), joyful (51%), and good for concept clarity (49%). When **prompted** about each of the above three benefits, most (90%) responded in the affirmative for each of the three attributes. The impact of the smart class on the learning process was positive as all four parameters (attention, learning, language/ communication, and thinking/reasoning ability) of learning rated as "good" increased drastically after the smart class installation (94-97%) as compared to before it (22-42%).

Student perception on Impact on Learning Process – Before and After having a Smart Class



The **teachers** appreciated the initiative of setting up smart classes in schools. Teachers were by and large **comfortable** in teaching using smart classes; however, a few teachers were interested in attending training twice a year. Teachers were **satisfied with the quality of digital content** and smart board. They perceive that learning is effective, joyful, and interactive when they use visuals or videos to explain any concept. The smart board with digital content enables them to teach the students all the concepts with ease, especially for subjects like science, mathematics, and biochemistry. Digital content encouraged students to ask questions and clarify doubts. Teachers perceived the shortage of smart classrooms as against the requirement. A couple of schools already having smart classes required more such facilities to match the school's strengths. The smart board provided now under the FDP was reported to have more **features**, hence more helpful. With the use of smart classes, teachers reported changes in terms of enhancement in school **reputation**, improvement in learning, student attendance, and enrolment.

SCHOOL INFRASTRUCTURE

TOILET FACILITIES

Repairs and renovation of toilets (in terms of flooring, tiling, ensuring water availability and functional draining systems, provision of urinals for boys, and hygiene spaces for girls) was another much needed infrastructure upgradation undertaken as part of the FDP. The study found that 20 toilets (9 boys' toilets, 7 girls' toilets, and 4 staff's toilets) across 11 schools were observed as fully functional, reportedly remained functional for 5- 7 days a week and water was available in all the toilets. Overall, the physical condition of the toilet facilities across the schools was rated as **"good".**

Almost all students reported using the toilets renovated last year (98%). Most reported using renovated school toilets more often now (76%). Students liked the **nice and clean look** of the toilet with the renovated floor, walls, roof tiles, etc (90-92%%), the **availability of water** in the toilet for most of the time (83%), the wash basin installed in the toilet (77%), toilets have more facilities bucket, mug, soap, etc (46%) and the number of functional toilets increased after repair work (36%). As an impact, they felt **secure** (73%) and **comfortable** (66%) after the renovation, regular water availability (58%), and cleanliness (48%) of the toilet. They were not required to leave the school midway to use the toilet (41%) and girls were able to attend school during menstruation (31%) after repair work. Increased usage, cleanliness, comfort, and a sense of security among students and teachers alike were the major impacts of the repaired/ renovated toilets.

DRINKING WATER FACILITIES

As per the needs of schools concerning drinking water facilities, drinking water structures were repaired and refurbished to provide cleaner and safer drinking water in schools including the provision of RO for the purification of water, repair of the water storage tank, provision of water taps, etc. The study found that these repair works were undertaken in 4 schools. Each school has one RO water access point and it was found functional. The other water access points in these schools were tap water (3 schools) and handpump (1 school). A water storage tank repaired last year in a school was observed to be in "fair" condition.

A majority of students used the RO water access point that was repaired last year in the school (78%). The students were appreciative of the **clean water** they get now (73%), can drink water when thirsty (68%), and get cool water during summer (58%). As an impact, three-fifth of the students perceived that their **water intake had increased** post-renovation (59%) of water access points. These findings resonated with teachers as they reported the water access points due to additional taps have increased after renovation and clean and safe water is available to students now due to the availability of RO water.

LIBRARY

The project primarily provided almirahs and books to 10 schools and newspaper stands to all 11 schools with an expectation to have improved libraries with a wide range of reading-learning materials and to have students inculcated and improved reading habits. Almost all students reported that the library had more books (99%), better furniture now (76%) and better looks (74%). Students reported that their **interest in reading** has increased (77%) or somewhat increased (21%) due to the renovated library. Teachers reported that the school greatly needed books and an almirah to **keep these books** as the books already available in the library were being attacked by mice due to the lack of an almirah/rack. Now books are arranged properly in almirahs and it has become easier for students to read the name of the book and get the book of their interest issued. Teachers perceived that Punjabi Language books and motivational books helped **improve the reading habits of students**.

SCIENCE AND MATHEMATICS LIBRARY

The project focused on improved science and math labs in schools to facilitate learning that helps develop creativity and problem-solving skills in students and also on the availability of better storage units for proper maintenance of equipment/lab materials. The project provided an almirah, lab stools/chairs, a demo table, and the paintwork in the science and math labs in schools mapped out for these requirements. Students reported that the science and math labs had more furniture now (78% and 65% respectively), the labs now had storage units that help to properly keep lab equipment/material (66% and 56% respectively), the lab looks good with BaLA paintings now (58% and 51% respectively), the lab now has more equipment for doing science experiments/models and aids for learning math concepts (52% and 53% respectively), etc. Students' **interest in science and math as a subject has increased** (75% and 59% respectively) or somewhat increased (21% and 23% respectively) due to the renovated science and math lab. As per the teacher's feedback, the infrastructure upgradation of the science and math labs was much needed because the condition of the labs was not good as there was no furniture and students had to sit on the floor. Instances of water logging in the maths lab were also reported. The supply of furniture and other repair works including tiling, flooring, paintwork, etc made the science and maths lab **effectively usable for students.**

SPORTS

The project provided sports kits to the schools to enhance the active engagement and participation of students in extra-curricular and sports activities. The study found that all the schools were provided with sports kits comprising sports materials required for cricket, badminton, football, and yoga. Nearly half of

the sports kits were in good condition and the rest half in fair condition. The majority of students (88%) made use of sports distributed in their school and that **enhanced their participation in sports** (82%). Teachers echoed similar findings and stated that both boys and girls actively participated in sports due to the given sports kits. Students' greater interest in sports activities **improved student attendance** also.

OTHER REPAIR/ RENOVATION WORKS/BALA WORK

BaLA work was undertaken in two of the schools and the quality or condition of BaLA work was observed as "good" in one school while its condition was "fair" in the other school. BaLA work was perceived to be "good" in science and math labs and liked by more than half of the students (51-58%). Besides learning the concept, BaLA work helped students in developing drawing skills. As regards teacher's perception about other infrastructure, the corridors/verandahs/halls/kitchens had issues including improper flooring and roof, flooring with dents, drainage issues, water logging during rains, damaged sheds, water seepage, the pathetic condition of the Mid-Day Meal room (had broken nets, rats and other animals would get in and destroy the grain). Teachers appreciated the much-needed renovation support provided by the NGO as it motivates students to learn. As observed, the condition of other renovated corridors, Verandahs, Kitchen, ROT, Computer room, Health care room, paintwork, etc was observed to be in "good" condition.

TEACHING QUALITY

Largely, students reported that **teaching quality has improved** due to overall school infrastructure upgradation (79%). Also, improvement in teaching quality due to smart classes was evident from the survey findings. Almost all students preferred the teacher using digital content for teaching instead of traditional classroom teaching. The digital content used in the smart class helped them understand the concept easily (98%), and they were satisfied with digital content-based teaching (96%). The impact on the learning process on students was positive as all four parameters of learning (attention, learning, language/communication, thinking/reasoning) evaluated as "good" increased drastically after the smart class installation (94-97%) as compared to before it (22-42%). The teaching **efficiency of teachers increased** after the school infrastructure upgradation (pre-score- 7.9, post-score- 9.5)

SCHOOL PERFORMANCE

Student's perspectives on the various parameters such as students' attendance, understanding of concepts, school reputation, and teaching quality were positive as a large proportion of students for these parameters ascribed to a "True" rating (67-91%) followed by an "A bit true" rating (8-21%) revealing attested change in school performance. According to teachers, the school upgrade work impacted the life skills of students including learning/comprehension/reasoning skills, communication skills, confidence, and cooperation/team building skills as the score for each of these attributes was **higher** after the upgrade work than before it. Teachers also reported that the positive changes in the interest, attendance, and overall educational outcome of students, before and after the intervention, were evident as the analyzed score for each of the parameters **increased** after the school upgrade works as compared to before it.

Teachers' opinion on student learning and life skills-related aspects, before and after the school infrastructure upgradation *(mean score, out of 5)*

	Before	After
Learning/Comprehension/ Reasoning Skills	3.6	4.4
Communication Skills	3.6	4.6
Confidence	3.4	4.4
Cooperation/ Team Building Skills	3.7	4.4

In Sum: IMPACT OF SCHOOL UPGRADATION

Students and teachers perceived a positive change after school upgradation in learning and teaching experiences:

- Schools now have more engaging classes now due to *smart classes* using digital content causing improvement in life skills of students viz. attention, learning, communication, and thinking skills
- The efficiency of teachers improved due to the *smart class* using digital content
- Schools got community recognition as a smart school
- Language, vocabulary, and drawing skills triggered through BaLA work and library books
- Physical activity prompted through sports kit
- Interest in subjects through effective use of science and math lab provided with furniture enhanced
- Parents willing to send their children to government schools
- Students, especially girls felt secure and comfortable after school toilet upgradation and had access to clean water through RO system.
- Enrolment and attendance enhanced after school upgradation.

Teachers and students experienced the benefits of good infrastructure and recognized the comfort that better learning spaces can bring in terms of motivation to learn.

RECOMMENDATIONS

The school may prepare a proper maintenance plan and involve community or panchayat and student committees for the long-term sustainability of this infrastructure. NGO- SACH may consider revisiting the schools to extend their support for maintenance. School may plan to conduct refresher training on smart class for new teachers.

INTRODUCTION

Chapter 1

HDFC bank carries out its CSR activities under the umbrella of 'Parivartan', through which it tries to reach out to communities and enable them to shift from poverty to growth. Through interventions in the areas of *rural development, education, skill development and livelihood enhancement, healthcare & hygiene, and financial literacy,* Parivartan aims to contribute towards the economic and social development of the country by sustainably empowering its communities.

The Focused Development Program (FDP) of HDFC Bank CSR is one among its many important programs, where the Bank chooses an implementing partner with expertise in one of the focus areas and tries to improve the lives of the target beneficiaries around that particular focus area. Systematic routine monitoring and independent evaluations are regularly undertaken to assess the effectiveness of projects under their programs.

The proposed research was hence commissioned to conduct an Impact Assessment of the FDP project P0487 which was implemented in 21 government schools across 5 blocks in Ludhiana.

This FDP project was focussed on ensuring quality education for all. This Impact Assessment was conducted to assess what positive changes it has brought in the quality of education imparted through these schools along with changes in student educational outcomes. The intervention aimed to enhance educational structures in rural communities by improving school infrastructure, educational aides, and facilities. This initiative was geared towards providing a more conducive learning environment in government schools. Additionally, the intervention was intended to boost footfall and attendance rates while simultaneously reducing dropout instances.

The key activities undertaken as part of the project intervention are shown in Figure 1.1 below.

Key Activities Undertaken under FDP

STUDY METHODOLOGY

Chapter 2

This chapter describes the research methodology adopted for conducting the said Impact Assessment.

2.1. RESEARCH DESIGN

The research design for this study followed a cross-sectional **mixed method approach**.

The ***objective of the Assessment*** was:

- ***To assess what positive changes has the intervention brought in the quality of education imparted through these schools along with changes in student educational outcomes.***

The assessment focussed on conducting observation of the infrastructure upgradation work done along with collecting quantitative data from project beneficiaries, that is, the students, using a structured questionnaire which helped arrive at quantifiable results on the impact indicators; the qualitative techniques of data collection were used to gain descriptive insights from teachers/ principals along with gathering quantifiable estimates to understand change in student performance and educational outcomes. In the absence of baseline information, data from respondents was collected through a retrospective recall approach.

2.2. SAMPLE SIZE AND SAMPLING APPROACH

The coverage of the project was across 21 (20 initially + 1 additionally) government schools across 5 blocks of Ludhiana, Punjab.

For the purpose of the Impact Assessment, all 5 blocks were selected for sampling. Within them, number of sample schools to be covered was determined as 50% of the total universe of 21 schools – that is 11 schools. Smart class installation, being one of the core areas of intervention, it was ensured that all schools having that intervention be taken up for the survey. Remaining schools to achieve the determined sample size were selected randomly. Moreover, as the schools are clustered in a geographic region, 50% coverage was considered optimum to get the required data. A coverage higher than that would cause data saturation.

Table 2.1: Target and Achieved Sample Size

			Infrastructure Upgrade Observation checklist		Short structured interview with students	
Sl.	**Blocks**	**Schools**	**Target**	**Achieved**	**Target**	**Achieved**
1.	Dehlon	GHS Umaidpur Tibba	1	1	20	20
2.	Koom Kalan	GSSS Chaunta	1	1	20	20
3.	Koom Kalan	GSSS Kadiana Kalan	1	1	20	20
4.	Koom Kalan	GSSS Sahnewal	1	1	20	20
5.	Koom Kalan	GSSS Dhanansu	1	1	20	20
6.	Khanna	GSSS Nasrali	1	1	20	20
7.	Sidhwan Bet – 2	GSSS Bhundri	1	1	20	20

8.	Sidhwan Bet – 2	GSSS Purain	1	1	20	20
9.	Sidhwan Bet – 2	GSSS Hambran	1	1	20	20
10.	Sidhwan Bet 1	GSSS Sherpur Kalan	1	1	20	20
11.	Sidhwan Bet 1	GSSS Leela Megh Singh	1	1	20	20
	Total		**11**	**11**	**220**	**220**

In each of the 11 sampled school, the quantitative component comprised of observation of infrastructure upgrade done. It may be noted that the infrastructure provided or the repair work under the FDP in each of the 11 schools under study was physically observed by the surveyor along with school staff members, using an observation checklist. Additionally, 20 students from each of the 11 schools, totalling to 220, were also interviewed.

For the qualitative component, Key Informant Interviews (KII) were conducted for gaining deeper insights assessing program impact. Selection of respondents for the qualitative component was purposive. The sample spread for the qualitative component is as under:

Table 2.2: Distribution of achieved Qualitative Sample Size

Respondent category	Sample size
Key Informant Interviews (KII) • Principal • Teacher - Smart Classroom • Teacher - Science/ Maths • Teacher – Library • Teacher – Sports	Any 2 Key Informants per 11 school **(Total = 22)**

Two school staff (principal/ teachers) from each school were interviewed as part of the KIIs. The selection of which Teacher to be interviewed (Smart Classroom/ Science or Maths/ Library/ Sports) depended on which type of work was been done as part of the intervention in any particular school and their availability at the time of the survey.

2.3. STUDY TOOLS

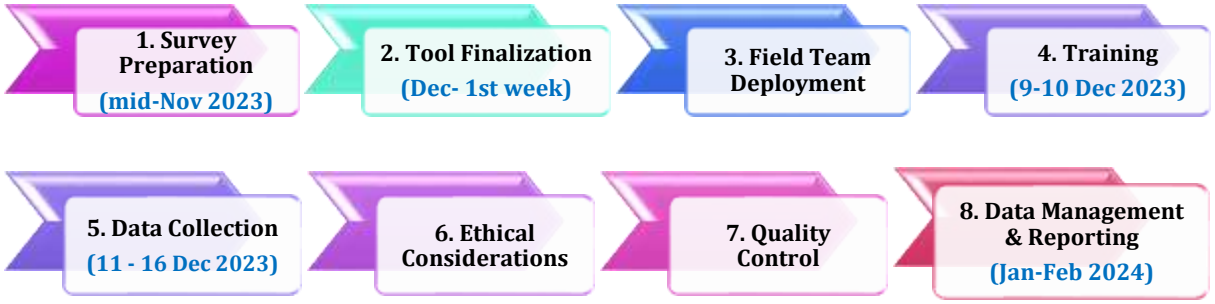
The research tool developed was in alignment with the intervention done under the FDP, with the aim to arrive at quantifiable impact indicators and assessing the project's efficacy, effectiveness and sustainability of outcome. Project related documents as obtained for HDFC Bank CSR were studied to get detailed understanding of the project and hence develop the tools. The tools developed as part of this Assessment included the following:

- Quantitative questionnaire
  - Infrastructure Upgrade Observation checklist
  - Short Structured Interviews with Students
- Key Informant Interviews (KII) Guide
  - Principal
  - Teacher - Smart Classroom
  - Teacher - Science/ Maths
  - Teacher – Library
  - Teacher – Sports

The quantitative research component comprised of the Infrastructure Upgrade Observation Checklist designed to systematically record and document upgrades done at schools; and Short Structured Interview Questionnaire with mainly close-ended questions, enabling capture of responses through pre-defined set of (multiple) response choices. The qualitative KII Guide had questions to help draw qualitative insights in keeping with the scope of the Assessment, with special attention to assessing the project's efficacy, effectiveness and sustainability of outcome. All tools were finalized in consultation with HDFC Bank CSR.

2.4. STUDY IMPLEMENTATION

The preparation for the Impact Assessment after commissioning from HDFC Bank CSR began in mid-November 2023. One of the important initial tasks was to study the project documents shared by HDFC Bank CSR, for developing an understanding of the project. The study tools were then developed and shared with HDFC team for approval. The CAPI digital scripting was also undertaken in preparation for the field launch in addition to other field level preparation. Field Team Training was held on 9th- 10th December, 2023 at Ludhiana for orienting and training the teams on the study protocols and tools. Soon after, data collection was launched from 11th to 16th December, 2023. This was followed by data processing, management, analysis and preparation of Report which was completed in the month of January-February.



Subject wise digital content at GSSS Sherpur Kalan

BaLA work on the walls at GSSS Umaidpur Tibba

BaLA work on pillars at GSSS Sherpur Kalan

Ongoing Smart Class at GSSS Kadiyan Kalan

Smart class teaching at GSSS Chaunta

Almirah for science, maths labs and library at GSSS Hambaran

Field Training of Enumerators at Ludhiana

Education park at GSSS Umaidpur Tibba

Water Structure repaired at GSSS Sahnewal

Work Details of SACH NGO written on school wall, GSSS Umaidpur Tibba

Intervention done by HDFC and SACH NGO

2.5. DATA MANAGEMENT, ANALYSIS AND REPORTING

After completion of data collection, final data collation, checking and cleaning of the completed quantitative interviews were done. Like-wise, transcription and further content analysis was undertaken for the qualitative capsule. Once the data was cleaned, it was analysed and Draft Findings Report prepared on its basis. Data analysis for the study highlighted the impact of the intervention through a quasi-experimental Post-Test Only Control Group Design which helped to assess the outcomes of the intervention. Descriptive statistical analysis using SPSS was conducted. Qualitative data analysis helped to supplement the overall findings and data trends reported.

2.5.1. ANALYTICAL FRAMEWORK

This Report on the Impact Assessment of FDP P0487 has made use of the OECD DAC[1] criteria as an analytical framework. This framework defines six evaluation criteria – relevance, coherence, effectiveness, efficiency, impact and sustainability – and two principles for their use. These criteria provide a normative framework used to determine the merit or worth of an intervention (policy, strategy, programme, project or activity). They serve as the basis upon which evaluative judgements are made. This framework recommends adapting this framework, wherever feasible and applicable. Application of this framework to the present Impact Assessment study is discussed in detail in the chapter on Discussion, Chapter 5.

[1] https://www.oecd.org/dac/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm

The OECD DAC Framework

2.6. FIELDWORK CHALLENGES

The field team did not face any major challenges in conducting the data collection. However, in some schools the teachers who had overseen the infrastructural changes had transferred or left the school. This made it challenging to gather findings and information.

STUDY FINDINGS

STUDY FINDINGS

Chapter 3

3.1. PROFILE OF RESPONDENTS

The sample consisted of 220 students equally spread across 11 schools in the Ludhiana district of Punjab with adequate representation of boys (41%) and girls (59%). Most of the students (92%) were aged between 12-17 years with an average age of 15 years and they were studying in classes 8-12.

Table 3.1: Class-wise distribution of students covered

	Boys	Girls	All
Class 8	18	22	40
Class 9	26	34	60
Class 10	18	22	40
Class 11	9	31	40
Class 12	20	20	40
Total students	**91**	**129**	**220**
Average Age	*15*	*15*	*15*

In addition, 22 key informants mainly included the school principal, vice-principal, and teachers covering 2 key informants per school. They belonged to the age group 29-58 years, with an average age of 45 years. Attempts were made to include subject teachers in line with the renovation work undertaken in the school. For example, in schools where infrastructure was provided or refurbishment or renovation work was undertaken in science or math labs or libraries, interviews were conducted with science, math, and library teachers. Similarly, for the smart class assessment, the smart class teacher was interviewed. Teachers from other streams like English, history, and commerce were also included in the sample to get a holistic view of the current assessment. The number of years of experience of teachers surveyed ranged from 2 -38 years, with an average of 10 years, of which 1-26 years (average of 18 years) experience in the surveyed school only. Except for a couple of teachers, all the teachers received training in using digital content.

Table 3.2: Profile of Teachers covered

	Male	Female	All
Total principals/ teachers covered	8	14	22
Average Age	47	44	45
Experience (in years) in same school	13	8	10
Total experience (in years)	21	16	18

3.2. CLASSROOM INFRASTRUCTURE

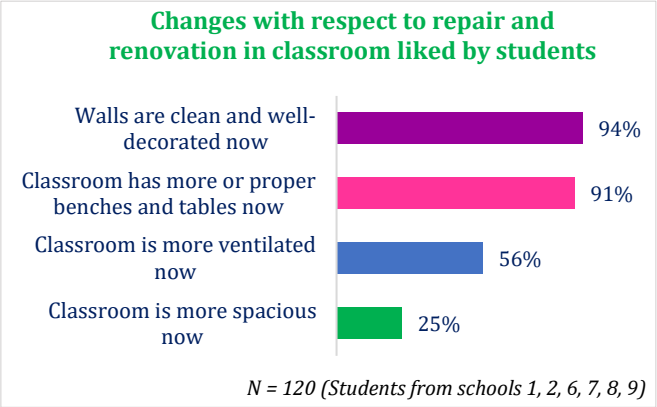
Research studies have indicated that key school infrastructure positively contributes to student academic outcomes. Therefore, it is important to ensure that each space in the school meets the needs of the students, teachers, and other staff. Under the HDFC - FDP project, renovation or structural upgradation and refurbishment including plastering and painting of classrooms, multipurpose classrooms, and vocational classrooms in some of the schools were undertaken on a priority basis. During the survey, the condition of the classroom was observed using a three-point scale – Out of 10 marks, Poor (0-3 marks), Fair (4-6 marks), and Good (> 7 marks). Of the 17 classrooms observed across 6 schools[2] where the refurbishment or renovation work was reported to be undertaken, half of the classrooms were observed to be in "good" condition and the rest were found in "fair" condition.

Table 3.3: Classroom infrastructure observation

Parameters	No of schools	No of classroom	Condition of classroom	Name of schools
Condition of the refurbishment of 9 classrooms including plastering and painting, flooring, etc.	2	9	7- Good condition 2- Fair condition	GSSS Hambran, GSSS Chaunta
Condition of the refurbishment of 2 vocational classrooms	1	2	2- Fair condition	GSSS Hambran
Refurbishment of 4 Classrooms along with other infrastructure	4	4	3-Good; 1-Fair	GSSS, Nasrali, GHS Umaidpur, GSSS Chaunta, GSSS Purain
Condition of structural upgradation of 2 multipurpose hall cum classrooms (Kota stone/Roof repair of hall etc)	2	2	3-Good; 1-Fair	GSSS Bhundri, GHS Umaidpur

Student's perception of the changes in the classroom post-renovation as compared to pre-renovation was recorded. Students from these schools (N=120) perceived that the walls of the classrooms were clean and well-decorated now post repair work (94%), have proper and a greater number of benches and tables now (91%), are more ventilated now (56%), and classrooms are more spacious now (25%). Students also perceived those improvements such as painting, plastering, providing furniture, smart boards, etc in their classroom had also helped them to pay more attention in class and so rated this parameter as "True" (98%) and a bit true (2%).

98% students think improvements such as painting, plastering, table-chair, smart classroom etc in their classroom have also helped them to pay more attention in class.



[2] Name of schools- GSSS Umaidpur, Hambran, Bhundri, Nasrali, Chaunta, Purain

The above feedback resonated with the teachers of these schools, as they reported that the classrooms before the renovation did not look neat and clean, but after the renovation, the classrooms (with plastered walls and windows, furniture, etc) looked good and neat. The provided infrastructure support helped students to pay more attention in the classroom. They also felt that the government grants always fell short of the school requirements, and such initiatives (HDFC-SACH project) are useful to meet the requirements further.

> *Aesthetic beauty always attracts. It gives us positive vibes. It was in bad condition earlier, but now it has become great When the classroom is clean then naturally kids' interest increases in studies*
>
> - ***Teacher, GSSS, Umaidpur Tibba***

> *This is a very important step to renovate classrooms as in the future it will provide good support to the school as well as the students.*
>
> - ***Teacher, GSSS, Hambran***

3.2.1. SMART CLASSROOM

With a vision to provide digital education to students in a more creative, interactive, and interesting manner, the FDP provided smart classrooms in government schools. 9 out of 11 schools[3] under the survey were provided with the installation of smart classrooms including the provision of smart boards and digital content for classes 8-12.

Table 3.4: Availability and Functionality of Smart Class Material Available

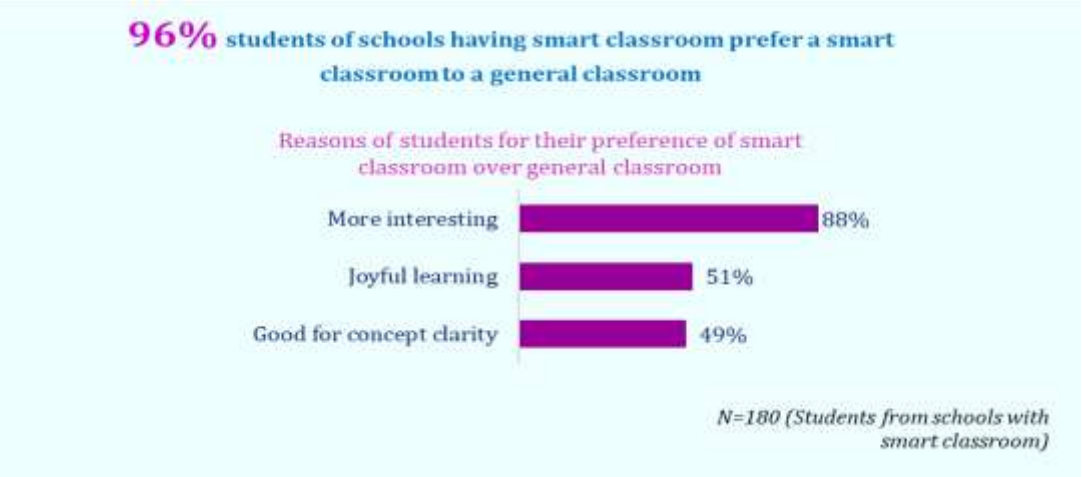
Material for smart class	Available (no of schools)	Number Available (no of items)	Number Functional (no of items)	Name of School
Computer	2	2	2	GSSS Kadiana, Purain
Classroom painting	1	8	8	GSSS Kadiana
Benches	5	77 *(Range: 10-27)*	77 *(Range: 10-27)*	GSSS Nasrali, Hambran, Sherpur Chaunta, Kadiana
Smart Digital Board	9	9	9	All school except GHS Umaidpur and GSSS Dhanansu
Digital Content for Grade 8	9	9	9	-do-
Digital Content for Grade 9	9	9	9	-do-
Digital Content for Grade 10	9	9	9	-do-
Digital Content for Grade 11	9	9	9	-do-
Digital Content for Grade 12	9	9	9	-do-

All the 9 smart classes installed under the project were functional with a smart digital board and digital course content. The smart class equipment was enabled to run on electricity or these have an in-built UPS connection/ power backup as well. The internet connection was reported to be available for smart class regularly in 4 out of 9 schools with smart class installation and all the 9 schools had flooring as well. The list of required materials available in the smart classroom as observed at the time of the survey and their functional status is provided in the table above.

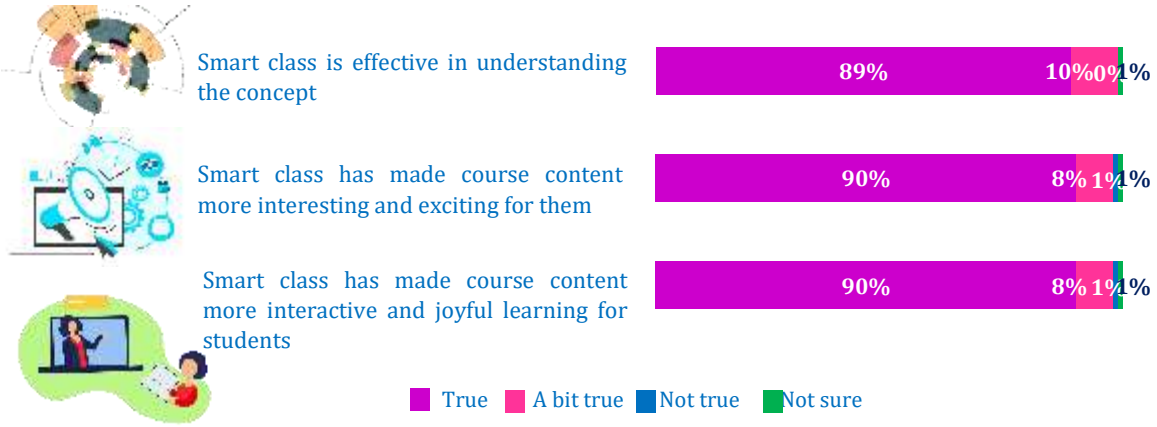
When students from these 9 schools were enquired about smart classrooms, almost all (96%) preferred a smart classroom to a general classroom as they stated spontaneously it was more interesting (88%), joyful (51%), and good for concept clarity (49%). Very few (4%) did not prefer smart classrooms as they were

[3] All sample school except GHS Umaidpur and GSSS Dhanansu

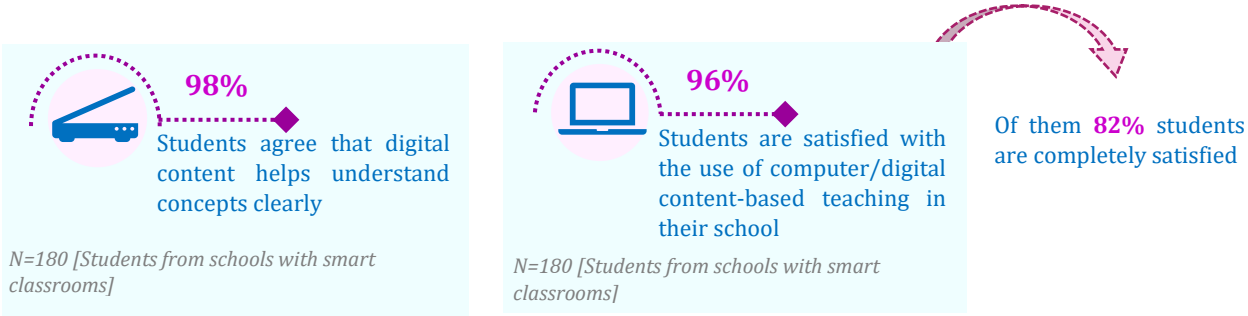
more comfortable in general or offline classrooms. When students were prompted about each of the above three benefits of smart class i.e. good for clarity of concept, joyful learning and it is more interesting, around 90 percent responded in affirmative for each of the three attributes.



Extent to which students prefer smart classrooms over general classroom



Students' perception regarding digital content as a teaching aid was also positive as they reported the digital content used in the smart class was helpful to understand the concept easily (98%) and they were satisfied with digital content-based teaching in their school (96%), majority among them being completely satisfied (82%). Almost all students who participated in the survey preferred the teacher using digital content for teaching instead of the traditional method of teaching used earlier. However, some of the students also faced problems during the class when their teachers used digital content for teaching due to lack of sufficient electricity (8%), sound issues (7%), poor visibility on the screen (3%), and network issue (3%).



An attempt was made to assess the change in the learning process before and after the smart class installation. The learning process was assessed in terms of change in attention, learning, language and communication, and thinking and reasoning ability of students after the smart class installation. The study found that the impact on the learning process was positive as all four parameters of learning rated as "good" increased drastically after the smart class installation (94-97%) as compared to before the smart class installation (22-42%).

Table 3.6: Impact of Smart Class Installation on Learning Process

Learning process parameters	Good (>7 out of10 marks)	Average (4-6 out of 10 marks)	Poor (< 4 out of 10 marks)
Attention			
BEFORE Smart Class installation	22%	76%	2%
AFTER Smart Class installation	97%	3%	-
Learning			
BEFORE Smart Class installation	23%	74%	3%
AFTER Smart Class installation	95%	5%	-
Language & Communication			
BEFORE Smart Class installation	42%	55%	3%
AFTER Smart Class Installation	94%	5%	1%
Thinking & Reasoning			
BEFORE Smart Class installation	28%	69%	3%
AFTER Smart Class installation	96%	4%	-

Base: 180 (students of schools with smart classes)

Teachers' perceptions about the smart class **installation** were positive. Across all 9 schools, teachers appreciated the initiative of smart class installation in schools. A couple of schools already had a setup of smart classes using projectors but they required more such facilities to match the school's strength. A couple of teachers felt that the government grants were never adequate to meet school requirements, therefore, NGOs must support to meet the requirements of the school. The smart board provided now by NGO has **more features**, hence more helpful.

As regards the **comfort and training** of teachers in using Smart Class, the study found that in addition to the vast teaching experience, a few teachers already had some teaching experience in using Smart Classes in their previous jobs. Teachers also received training from NGO-SACH on using digital content in all the schools. Some of the teachers reported being confident and comfortable delivering using smart classes and they wished to conduct training for those teachers who were not yet so comfortable. It was felt that smart class training must be conducted twice a year. Students are curious about technology so teachers must be comfortable using technology.

Teachers were satisfied with the quality of **digital content** and smart board. They perceive that learning is effective and joyful when they use visuals or videos to explain any concept. The smart board with digital content enables them to teach the students all the concepts with ease. Sometimes, they allow children to see the stories of their interest on YouTube in between their course material to retain their interest level in studies. The use of digital content makes it easier to schedule lessons and timings i.e. lesson planning.

Digital content in smart classes is more **advantageous** for students from higher classes (8-12th) as they only provide feedback to the teachers on how easy it has been for them to understand and grasp the course contents. Digital content encouraged students to ask questions and clarify doubts. Guests or other outside professionals also use smartboards with digital content for their lectures. To quote an example, it was reported in one of the schools that recently, a Punjab Police professional delivered a guest lecture using the

smart board and taught the students how to make an online complaint to the police or register an FIR, if required.

Teachers reported that science, mathematics, and biochemistry **subjects** were easy to explain using smart class technology. Smart classes were useful in conducting practical work/activities class, explaining mathematical diagrams on a smart board, and using video according to the topic. Similarly, in science class, students learn with ease and concentration the workings of digestive systems and carry out experiments using 3D videos on a smart board which is otherwise difficult to teach on a traditional blackboard. In biochemistry class, teachers were able to give notes to students easily. The smart class helps teachers also to upgrade their knowledge.

Teachers perceived that the smart board was more interactive with pre-installed software of subjects. Interaction with students has become easier in smart classes. It is **time-saving** for teachers to scan and project the chapters from books/notes on the screen (instead of photocopying) and for children to prepare notes. Smart class teaching increases the efficiency of teachers who are comfortably using the technology. This has been additionally useful for those children who cannot afford to buy expensive books. Despite the teachers giving their best in the class, weak students did not understand the concept but the use of colorful pictures or videos on a smart board generated interest to quickly understand the concept.

Teachers reported that the number of smart classrooms is **less than the requirement**. Further, the number of seats in the smart classroom is **less than the requirement of children**. Therefore, a few schools merged their smart classrooms with libraries or science or math labs so that the benefit of the smart classroom could be extended to a maximum number of children. A couple of schools already had a setup of smart classes using projectors but they required more such facilities to match the school's strength.

School reputation: A couple of teachers reported that parents are nowadays interested in sending their children to their school because they use smart technology to teach their students and are known as a **smart school**. It is like a dream come true for school staff.

Improvement in learning: It was perceived by teachers that as compared to the general class, the smart classroom with digital content ensures the **interest and active participation** of even backbenchers who otherwise ask fewer questions in the class. A few teachers reported that the **results** were better due to the installation of smart classes, however, a few other teachers though reported effective teaching and learning through smart classes but they had not analysed the situation in terms of results post-examination.

Student attendance and enrolment: Teachers reported that the infrastructure upgrade increases the **attendance and enrolment** of children in the school as it motivates parents for their children to seek admission in a government school where education is provided free of cost, unlike in a private school where an education fee is charged for similar facilities and infrastructure. Even the students of this school motivate other children to get admission to their school as the school conducts smart classes. Teachers opined that their school is at par with or even better than private schools in terms of school infrastructure.

> *"We already had a smart board in the school given by the government. However, the smart board that has been given by the NGO has some extra features that generate students' interest, hence the impact on children is greater and they remember the content for a longer time."*
>
> **- *Teacher, GSSS, Kadiana Kalan***

> *"It is easy to teach students using a smartboard. Smartboard also helps us plan lesson schedule."*
>
> **- *Teacher, GSSS Nasrali***

> *"The school looks good after the changes made; our school now is called a smart school."*
>
> **- *Teacher, GSSS, Hambran***

3.3.1. TOILET FACILITIES

To ensure usage, toilets need to have additional infrastructure in the form of water, functional doors, washbasins, proper flooring, etc. To ensure the availability of improved sanitation units for both teachers and students, the HDFC-FDP carried out the renovation and repair of toilet facilities in some of the selected schools of Ludhiana wherever it was needed the most. The renovation works included flooring work, roof and shed repair, provision/repair of the door of toilets to ensure the functionality of the door, provision/repair of wash basin, other brickwork, plastering, paintwork, etc. Depending on the requirement, the project also considered the provision of soap and water in private spaces in girls' toilets to manage menstrual hygiene and disposable bins for the disposal of menstrual hygiene material.

The table given below presents the number of schools and toilet facilities renovated or refurbished under the project. It also provides the condition of toilet facilities as observed on the day of the survey.

Table 3.7: Observation of toilet facilities

			Measure of Observed Condition of Toilet		
Parameter	**Number of schools**	**Number of toilets**	**Fully Functional toilets**	**Frequency of functionality**	**Toilets with water availability**
Boys' toilets	9	9	9	5-7 days a week	9
Girls' toilets	7	7	7	5-7 days a week	7
Staff Toilet	4	4	4	5-7 days a week	4
Total	**11**	**20**	**20**		**20**
	Number of schools	**Number of toilets**	**Very Clean (>7 marks)**	**Fairly Clean (4-6 marks)**	**Poor (< 4 marks)**
Cleanliness of toilets	11	20	12	6	2
	Number of schools	**Number of toilets**	**Good (>7 marks)**	**Fair (4-6 marks)**	**Name of school**
Condition of Flooring	9	17	15	2	All except GSSS Dhanansu and Purain
Condition of Roof /Shed	11	20	19	1	All
Condition of tiling	9	17	15	2	All except GSSS Hambran, GSSS Purain
Condition of Door/MS Door & its handle/latch	7	12	10	2	All except GSSS Hambran, Sherpur, Dhanansu , Purain
Condition of Paintwork	10	20	12	8	All except GSSS Purain
Condition of Fixture-wash basin	7	11	8	2	All except GSSS Hambran, Bhundri, Dhanansu, Purain
Brickwork and Plastering	8	14	9	5	All except GSSS Sherpur, Dhanasu, Purain
Condition of toilet water taps	7	13	7	6	All except GSSS Hambran, Sherpur, Shanewal, Dhanansu
Condition of Urinal Partition	4	7	6	1	GSSS Nsrali, Umaidpur, Chaunta

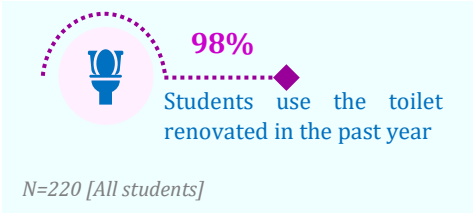
Condition of PCC Footpath to the toilet	7	11	9	2	All except GSSS Hambran, Sherpur, Dhanasu, Purain
Condition of interlock tiling footpath of the toilet for handicaps /railing	2	5	5	-	GSSS Nasrali, Leela Megh

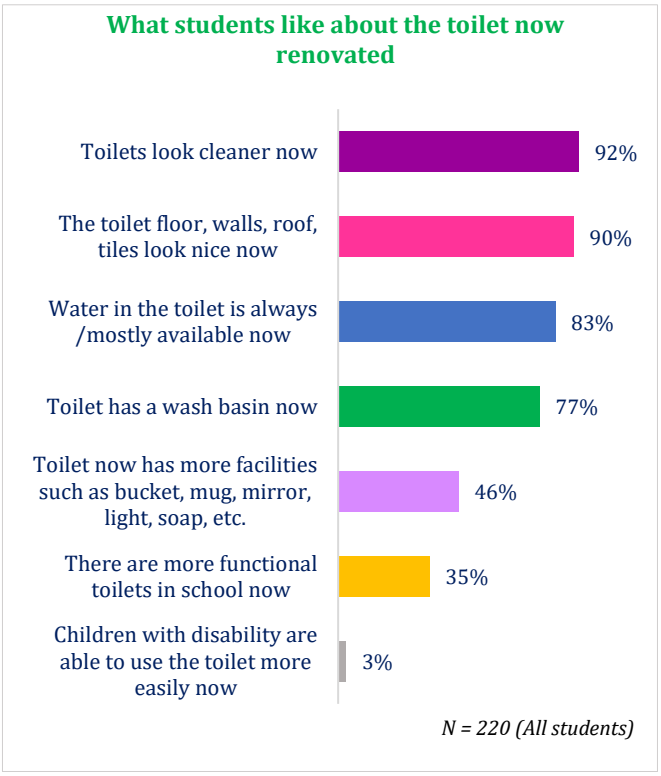
The study found that 20 renovated toilets (9 boy toilets, 7 girl toilets, and 4 staff toilets) across 11 schools were fully functional, and remained functional for 5- 7 days a week, with water available in all the toilets.

During the survey, the condition of the toilets was observed using a three-point scale – Out of 10 marks Dirty (0-3 marks), Fairly Clean (4-6 marks), and Very Clean (> 7 marks). Of the 20 toilets observed, 12 were found very clean, 6 fairly clean and 2 toilets were observed to be dirty.

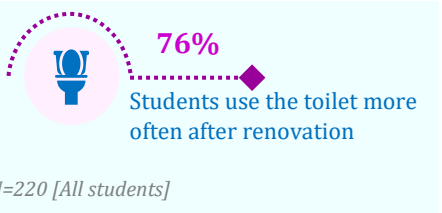
Overall, the physical condition of the toilet facilities across the schools was observed to be in a "good" condition. In one of the schools, a private space in the girls' toilet with water and soap is provided to manage menstrual hygiene, along with a covered bin/incinerator available for the disposal of menstrual hygiene material.

The change in toilet facilities as per the **student's perspective** was captured in terms of changes in the cleanliness and usage of toilets as compared to before renovation. Almost all students reported using the toilets renovated last year (98%). Students liked the nice and clean look of the toilet with the renovated floor, walls, roof tiles, etc (90-92%%), the availability of water in the toilet most of the time (83%), wash basin installed in the toilet after renovation (77%), the availability of more facilities like bucket, mug, soap, mirror, light, etc (46%) and the increased number of functional toilets after repair work (36%).

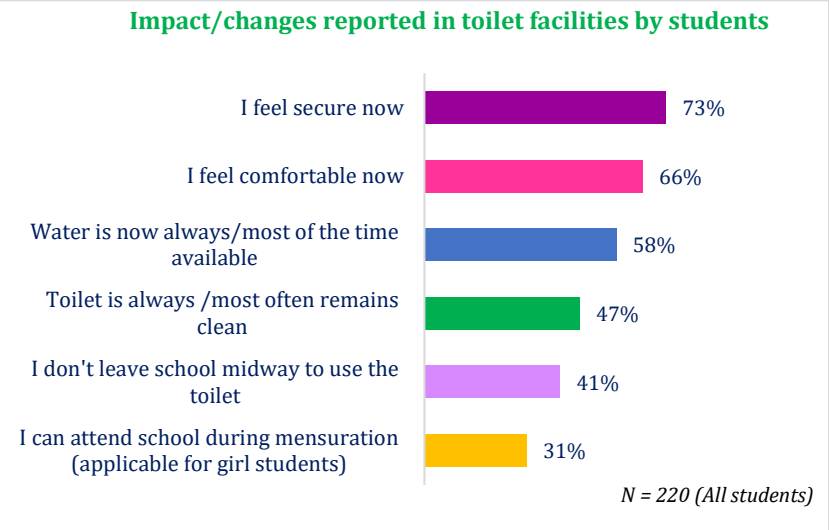




The most important impact of renovated toilets on the students was the sense of security (73%) and comfort (66%). They were not required to leave the school midway to use the toilet (41%) and girls were able to attend school during menstruation (31%). The renovation and repair work has affected the students' usage of toilets as compared to before the renovation – most of the students reported using school toilets more often now (76%) and some used the toilet the same as before (23%) and the rest (1%) were not sure of change in usage of toilet.



*Usage same as before – 23%
Unsure – 1%



Need for intervention: A couple of teachers reported the requirement for renovation of washrooms as prior to the intervention, they were in dilapidated conditions. As reported by various teachers, owing to the need for minor repairs, the toilets had become non-functional. In Purrain, the toilet was reported to be non-functional owing to the blockade from leaves in the pipes. It was essential to ensure repair of various components of the washroom to ensure that the washrooms can be of use again. The proportionality of the washrooms was less with respect to the strength of students at the school[4]. Hence, it was necessary to ensure the functionality of most washrooms. In some schools, the washrooms did not have sheds, making it difficult to use and inaccessible especially during the rainy season. Additionally, this was also a concern for safety of girl students in schools. The non-functionality of toilets caused high absenteeism in schools[5], as children preferred to stay at home in case of issues of stomach problems.

Structural Changes: As regards the renovations that were done through the intervention, painting of the toilets was done in some schools[6]. Other renovations in the form of flooring and tiling[7] was done. In some schools, the roof or shed[8] was provided to the schools to ensure that safety of the students using the washrooms. The pathways[9] damaged were also refurbished to increase accessibility to the facilities. Other renovations done include addition of door[10] and installation of commode (Sherpur Kalan), washbasins[11] and urinals[12]. In some schools (Leela), locks and bolts were installed as well. The drainage system was repaired in one of the schools (Kadiyan Kalan) to ensure functionality of the toilet.

[4] Schools – Purrain, Sherpur Kalan, Umaidpur
[5] Schools – Umaidpur
[6] Schools – Bhundri, Chaunta, Sherpur Kalan
[7] Schools – Chaunta, Dhanasu, Leela, Sahnewal, Sherpur Kalan, Umaidpur
[8] Schools – Leela, Purrain, Sahnewal, Sherpur Kalan
[9] Schools – Leela, Hambran
[10] Schools – Dhanasu, Umaidpur
[11] Schools – Sahnewal, Sherpur Kalan
[12] Schools – Dhanasu, Sahnewal, Umaidpur

"As the roof was not there, the washrooms used to get dirty very easily. Now that the roof has been made, there is shelter. The washroom does not get dirty soon and safety is also there."

– Vice Principal, Sahnewal

"Path to the male toilet was not there but it was later made. It was difficult to go in the rain so they prepared a shade."

– Science Teacher, Hambran

"The corridor roof was unsafe so now they had used quality material to make that roof. Now we are not facing any problems like water seepage"

– Smart Class Teacher, Purrain

Impact of changes: As regards the changes owing to the renovations in the toilets, hygiene and cleanliness levels have increased. Moreover, students also ensure to keep the toilets hygienic and clean. Issues pertaining to availability of water has also been addressed. The increased availability of water (Chaunta) has ensured the toilets to be used easily and regularly cleaned. This has ensured considerable improvement in maintaining cleanliness of the toilets.

The increased functionality of toilets has ensured a greater number of toilets to be used. In some schools such as in Chaunta, there were a smaller number of toilets meaning that all students had to use the same toilet. The renovation of other toilets led to separate toilets for boys and girls. Teachers have reported increased sense of security owing to the installation of roofs, locks and bolts. There is more comfort and ease in using the toilets, as renovated. Teachers have reported decreased hesitancy of the usage of toilets among children.

"Initially, students did not feel comfortable and waited to use the washroom once they were at home but that doesn't happen now, they use it here. If there is some function in our school, students from outside come to our school and they use it easily. It is all clean, there is no problem."

– Science Teacher, Dhanasu

The renovation of toilets and availability of water has ensured better facilities for girl students to use the toilets during menstrual cycles for clean-up and hygiene. Moreover, teachers have reported increase in the attendance of the girl students, as they feel comfortable in coming to school even during their menstrual cycle as compared to earlier. This positive change can be attributed to the improved toilet facilities.

Girl students have been given sessions on menstrual hygiene management in all schools. Teachers have reported it to be helpful for girls. Additionally, the Vice Principal at Sahnewal has also reported that the students now get a space to talk about menstrual health which they generally do not get to discuss at home.

"(Before the renovations) .....Many girls did not come to school during their menstruation cycle. Now, they know we have washroom facilities so they don't hesitate at all. They talk to us openly and there is no issue of the washroom. We would have to call the girls' homes and inquire why they are not coming to school but now it has reduced."

– Science Teacher, Dhanasu

"Yes it (awareness session on menstrual health) was beneficial and they should do more sessions like this. Especially for the girls who cannot talk about these things at their home. They can talk about those things to the doctors. So that was beneficial for the girls."

– Vice Principal, Sahnewal

Maintenance: In regards to the maintenance of hygiene and routine cleanliness, all schools have reported that they have allotted staff persons for cleaning. Additionally, monitoring of cleaning activities is also done by the teachers in the schools, in a cyclical manner. The duties for monitoring have been divided among the teachers who ensure that the cleaning is being taken care of. Moreover, students have also been oriented at maintaining basic hygiene and cleanliness.

"We have one maintenance team which always keeps an eye on the cleaning section. They will always keep a check over the toilets and also bring notice to the school management about the difficulties or disturbances happening in the cleaning."

– Vocational Teacher, Sahnewal

3.3.2. DRINKING WATER FACILITIES

To provide cleaner and safer drinking water facilities to the students, the water facility needs to be supplemented with a filtration system. The HDFC-FDP, based on requirements mapped out by schools, carried out repairs for the improvement of drinking water facilities including the provision of RO for the purification of water, repair of the water storage tank, etc. The surveyor observed these changes and repair works and also interviewed students and teachers to understand their perspectives on the changes made and the impact of these changes.

Table 3.9: Observation of Drinking Water Facilities

Parameter	Number of schools observed	Observation	Name of Schools
Drinking water access points **available**	4	4 - RO Water 3 - Tap Water 1- Handpump	GSSS Kadian Kalan, GSSS Chaunta, GSSS Purain, GSSS Sahnewal
Drinking water access points **Functional**	4	4 - RO Water 3 - Tap Water 1- Handpump	-do-
Frequency of Functionality of RO Water Access Point	4	5-7 days a week	-do-
Condition of the water tank Storage	1	Fair	GSSS Kadiana Kalan
Whether the water storage tank was covered	1	Found Covered	GSSS Kadiana Kalan

The study found that these repair works were undertaken in 4 schools. Each school has a functional RO water access point, tap water (in 3 schools), and handpump (in 1 school). A water storage tank repaired last year in one of the schools was found in "fair" condition and was covered.

A majority of students used the RO water in the school (78%) and some did not use it (16%). A few (6%) were not sure if they used RO water. When enquired from the students about their liking of the RO water access point, a majority of the students reported that they get clean water (73%), they can drink water when thirsty (68%), and they get cool water during summer (58%). Students also perceived that improvement in drinking facilities also affected their water intake in school as compared to before renovation work. According to a majority of students (59%), their water intake had increased post-

renovation and for some (33%) water intake was the same as before and a few (8%) were not sure of the change in their water intake post renovation of water access points.

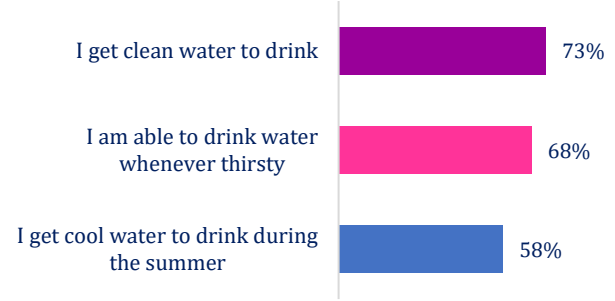
78%

Students drink water from the RO/ water cooler/ water structure that was installed or repaired in the school last year

N=120 [Students from schools with renovated drinking water structure]

Of the students who drink water from the renovated water structure 61% drink more water now, 38% drink the same amount of water as before and 1% were unsure.

What students like about renovated drinking water facilities



N = 120 (Students from schools with renovated drinking water structure)

Need for intervention: As regards the requirements for making drinking water facilities better, the teachers reported the need for repair of the RO water system. This was deemed necessary for improving the quality of water. In Sahnewal, the Vice Principal reported the students to be falling sick by drinking unclean water. Moreover, some schools[13] also required the installation of additional taps to increase access among a greater number of students.

Structural changes: In numerous schools, RO systems have been installed for improving a better quality of water. To address the need for increased access of water systems, RO water systems[14] were installed along with taps[15] in many schools.

.

> *"Yes, because of the repair of RO, the students are now able to drink safe and clean water. Earlier students were drinking water for their emergency and they used to fall sick also with the impure water, but after the repair of RO water, they are now feeling safe. Now after the renovation of RO plant, they are fearlessly drinking safe and pure water."*
>
> ***– Vocational Teacher, Sahnewal***

Impact of changes: In terms of cleanliness, teachers have reported instances of increased availability of clean water after the installation of RO systems. Installation of RO and taps have ensured increased availability of water. It was also highlighted through the Vice Principal at Sahnewal, that the installation of clean drinking water facilities has led to increased percentage of children attending school.

> *"There was a drinking facility before too, the RO was before but it was not enough. We told them (SACH NGO) to get it fixed and they accepted our request. And now students are drinking very clean and pure water. The percentage of the students attending classes has been increased by 20-30%."*
>
> ***– Vice Principal, Sahnewal***

[13] Schools – Kadiyan Kalan
[14] Schools – Bhundri, Dhansu, Kadiyan Kalan, Purrain, Sahnewal
[15] Schools – Chaunta Koom Kalan, Kadiyan Kalan

3.3.3.LIBRARY

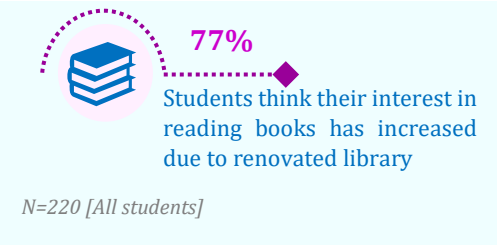
To have improved libraries with a wide range of reading-learning materials and to have students inculcate and improve reading habits, HDFC-FDP primarily provided almirah, books, and newspaper stands to schools.

Table 3.10: Observation of Library Infrastructure

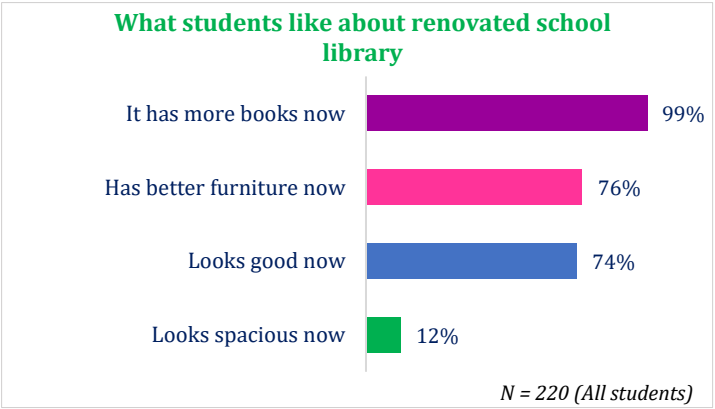
Parameter	Number of schools	Number of items
Almirah	10 *	23
Books	10 **	175
Newspaper/Magazine stand	11	11
Clipboards/Softboards	4	4

* All school except GSSS, Dhanansu
**All schools except GSSS, Sahnewal

Students liked the libraries having more books (99%), better furniture (76%), and better looks now (74%). A few students (12%) felt that their libraries had become more spacious than before the refurbishment. It is relevant to mention here that a couple of schools merged their libraries with smart classes. In such cases, students reported the installation of digital screens and LCDs in the library. A majority of students (77%) also reported that their interest in reading has increased (77%) or somewhat increased (21%) due to the renovated library. The rest (2%) did not realize any change in their interest in reading due to the renovated library.



*Somewhat increased – 21%
No change – 2%



Need for intervention: From the qualitative insights from teachers, it was highlighted that students required books, outside their syllabus for relaxation and developing interest. Teachers opined that books were necessary for the students to feel motivated and develop varied interests. Books in library were kept on table and were getting damaged by mice. There was need for organizing books in cup boards and shelves.

Structural changes: Intervention in the form of providing books in library was done and shelves or glass almirahs, in all schools. Moreover, in some schools, newspaper stand was also provided.

Impact of the change: The provision of glass almirah has made the books more visible for students, causing an increased interest among students. The almirah and shelves have ensured more systematic arrangement of books. Students are now able to issue books easily and take them home for reading. The newspaper stand has made students interested in reading the newspaper.

"The students cannot read syllabus books throughout the day, so it is like a recreational activity for them in a way where when they come here, they read some different kind of books like children's stories or inspiration books such as the biography of Abdul Kalam. This will help to divert their mind and also get inspiration. They can also be motivated to become an author."

– Lab Teacher, Bhundri

3.3.4. SCIENCE AND MATHEMATICS LABS

Science and math labs in schools facilitate learning that helps develop creativity and problem-solving skills in students. The project thus intended to improve these labs and also to ensure the availability of better storage units for proper maintenance of equipment/lab materials.

The table given below details of infrastructure and the general conditions observed in these labs:

Table 3.11: Observation of Science and Math Labs Infrastructure /Furniture

Parameter	Number of schools	Number of items	Name of Schools
Lab stools/ Chairs	5	69	GSSS-Nasrali, GSSS Hambran, GSSS Leela Megh, GSSS Dhanansu, GSSS Chaunta
Teacher demo table	2	9	GSSS Leela Megh and GSSS Dhanansu
Racks (math lab only)	3	11	GSSS Chaunta, GSSS Kadiana, GSSS Dhanansu
Almirah/Cupboard for storage	9	20	All 11 schools except GHS Umaidpur and GSSS Purain
Paintwork	3	3	GSSS Nasrali, GHS Umaidpur, GSSS Sahnewal
Condition of sink with water supply (Science lab only)	2	Poor	GSSS Nasrali, GHS Umaidpur
Quality of Renovation work /Tiling	2	Good	GHS Umaidpur, GSSS Sahnewal
Condition of BaLA resources in Science Lab	1	Good	GSSS Sahnewal
Condition of Roof (Science lab only)	2	1-Good; 1-Average	GSSS Nasrali, GSSS Umaidpur

Note-Poor (0-3 marks); Average (4-6 marks); Good (7 and above marks) out of 10

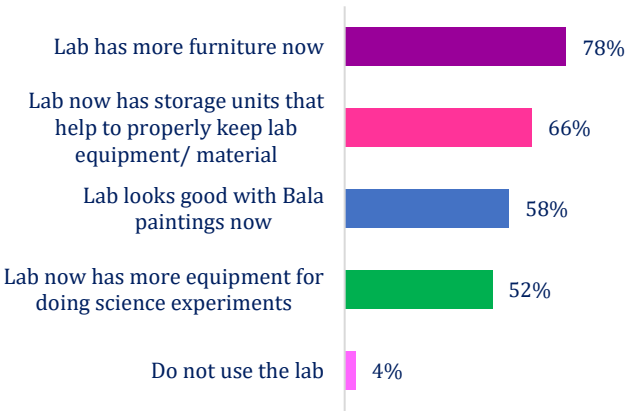
Students were asked about what they liked about the renovated science and math labs and whether the provision of furniture and other repair work helped them increase their interest in subjects like science and mathematics. Students reported that the science and math labs had more furniture now (78% and 65% respectively), the labs now had storage units that help to properly keep lab equipment/material (66% and 56% respectively), the lab looks good with BaLA paintings now (58% and 51% respectively), the lab now has more equipment for doing science experiments/models and aids for learning math concepts (52% and 53% respectively), etc. Students' interest in science and math as a subject has increased (75% and 59% respectively) or somewhat increased (21% and 23% respectively) due to the renovated science and math lab and the rest (4% and 18%) didn't find any change or were not sure of it.

75%

Students think their interest in science as a subject has increased due to renovated science lab

N=220 [All students]

*Yes, somewhat increased – 21%
No change – 11%
Not sure – 3%

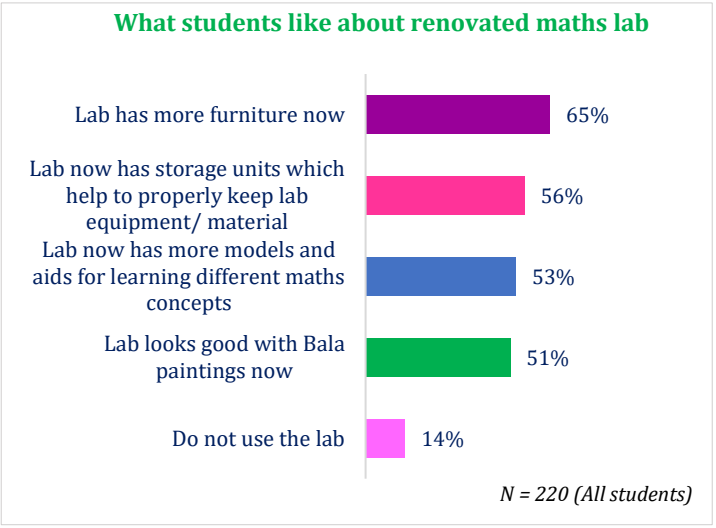


59%

Students think their interest in maths as a subject has increased due to renovated maths lab

N=220 [All students]

*Yes, somewhat increased – 23%
No change – 10%
Not sure – 8%



Need for intervention: The qualitative insights brought out that the science and maths lab required renovation. Teachers highlighted the requirement for furniture for the students to sit. At Sherpur Kalan, teachers highlighted the requirement for shelves to store apparatus. In some schools such as Umaidpur, there was a requirement for the total renovation of the lab. The lab room was being used as a storage for logs and trees.

Structural changes: Intervention in labs was done through provision of furniture[16] and racks for storing apparatus. At Purrain and Sherpur Kalan, almirah was provided for the safe-keeping of apparatus. At Umaidpur, total renovation of the science lab was done to make the lab functional again.

Impact of change: Insights from the principal at Umaidpur highlighted the sparked interest of students in science after the renovation of the labs. Increased interest in Olympiads and science club was seen among students.

[16] Schools – Bhundri, Chaunta Koom Kalan, Hambran, Kadiyan Kalan, Leela Megh Singh, Nasrali, Nasrali, Sahnewal, Sherpur Kalan

3.3.5.SPORTS LAB

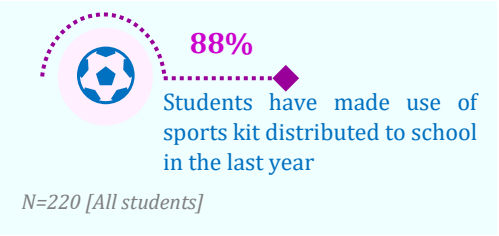
The project provided sports kits to the schools to enhance the active engagement and participation of students in extra-curricular and sports activities. Nearly half of the sports kits observed were in "good" condition and the rest half in "fair" condition.

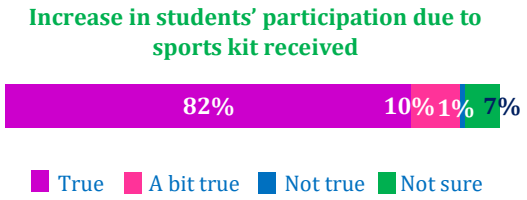
Table 3.12: Observation of Sports Kits

Parameter	Number of schools	Description	Name of School
Quality of renovation of sports room	2	Fair	GSSS Chaunta and GSSS Kadiana
Number of sports kits distributed	11	Number- 150	All
Quality of sports kits	11	72- Good; 78 - Fair	All

Out of 10 marks -Good (>7 marks); Fair (4-6 marks); Poor (0-3 marks)

The majority of students (88%) made use of sports distributed in their school and that enhanced their participation in sports (82%).





Need for intervention: Through the qualitative insights of the teachers, it was highlighted that there was need to inculcate interest of sports among students. Students were unable to participate in sports activities owing to lack of sports material and kits provided.

Structural changes: Schools were provided sports kits and equipment. They were provided materials such as yoga mats, rackets, ropes, hurdles etc.

Impact of change: Teachers interviewed, have highlighted a positive impact of the provision of the sports kit. There has been an increased interest of students to participate more in sports. Students feel more confident to play sports after receiving sports material. Students have become motivated in participating in inter-school sports competitions. In conversation with the Lab teacher at Bhundri, they highlighted that they themselves, have been able to train the students in sports with the new equipment. Moreover, the principal at GSSS Umaidpur highlighted that the students were able to participate in state and national level kabaddi and tug of war.

> *"The interest of students has increased. I created a cricket team and we took that to Sudhar college and we achieved second position there. The students did not take any training or coaching; I myself worked on them I used to play with them. We gave a tough competition and we won 2 to 3 matches regularly. If you will have resources then only you will be able to do better."*
>
> ***– Lab Teacher, Bhundri***

3.3.6. BALA WORK AND OTHER REPAIR/ RENOVATION WORKS

BaLA work was undertaken in two of the schools (GSSS Sherpur and Sahnewal) and the quality or condition of BaLA work was observed as "good" in one school (GSSS Sherpur) while its condition was "fair" in the other school (GSSS Sahnewal).

Table 3.13: Observation of Other Repair/Renovation works

Parameter	Number of schools	Description	Name of School
Condition of vinyl flooring -on the office floor/ROT room /Computer Lab	2	Good	GSSS Leela megh Singh and GSSS Sherpur
Condition of refurbishment/ renovation of the following:			
Corridor/Verandah,	4	3- Good; 1-Fair	GSSS Nasrali, GHS Umaidpur, GSSS Chaunta, GSSS Purain
Windows	4	3- Good; 1-Fair	-do-
Kitchen (including slab work)	4	3- Good; 1-Fair	-do-
Condition of renovation of the following:			
Corridor	1	Good	GSSS Kadian Kalan
Language educational park	1	Poor	-do-
Condition of Plumbing work /PCC work/Paintwork/RCC (Verandah/outside verandah/ corridor health room etc)	9	7-Good; 2-Fair	All except GSSS Kadian kalan and Sahnewal
Condition of MS cycle shed provided.	1	Good	GSSS, Nasrali
Condition of renovated Health Care Room, Edusat Room, Education Room,	1	Good	Kadiana Kalan

Of the 51% students who said that maths lab looks good with Bala painting, 67% students stated that their interest in science as a subject has increased due to the renovated science lab.

Of the 58% students who said that science lab looks good with Bala painting, 75% students stated that their interest in science as a subject has increased due to the renovated science lab.

Advantages: Intervention in the form of BaLA paintings have been done at many schools[17]. Through qualitative insights, teachers have highlighted that BaLA work has been helpful in making children remember things easily. Students seem more inclined towards studies. Moreover, students are now able to grasp ideas more easily, they are able to learn things more easily. Through the information provided on the paintings, the GK of students has also increased. Maths teachers at Sherpur Kalan highlighted that the visual learning has been effective in helping students memorize information. From looking at the paintings, they are able to remember the information for a long time.

Impact of change: The initiative of BaLA paintings have ensured positive changes among the students. Science teacher at Dhanasu, said that students seem to be taking more self-study initiatives. Moreover, teachers have also reported increased interest among students. They seem more curious and ask questions on the information on the paintings. The principal at GSSS Sherpur Kalan illustrated other positive changes such as better pronunciation, improved vocabulary and better grip of languages.

[17] Schools – Bhundri, Chaunta Koom Kalan, Dhanasu, Sahenwal, Sherpur Kalan

Suggestions to ensure the BaLA is more effective: The BaLA paintings have been helpful for the students. Teachers also made some valuable suggestions to make the paintings more effective. In conversation with the Lab Teacher at Bhundri, it was suggested that the paintings could be made into 3D paintings. The 3D effect of the paintings would help serve as a sensory experience, making the learning of the students more effective. Suggestion was also made for making 3D maps on the floor which would help make learning more immersive and impactful. Smart Class Teacher at Bhundri, also suggested that the BaLA paintings be made in the play area so that the students pay more attention to it. In addition to learning, BaLA paintings can also be done outside the schools to add to beauty and aesthetic value to the school infrastructure; as suggested by the Lab Teacher at Chaunta Koom Kalan.

> *"Students could use their third sense like touch so it will enhance their senses. If I talk about the map of India, then they should create such a map which should have mountains and you can see some desert here it means there is desert here and this is ocean here and that is how they will remember that these things are here. Each state has some famous things – such as the dance or food or landmarks such as Dal Lake in Jammu Kashmir. In 3D maps, kids can use three senses – listening, seeing and touching."*
>
> ***– Lab Teacher, Bhundri***

Other Repair/Renovation Work:

Need for intervention: Along with other infrastructural changes, initiatives of various miscellaneous repair and renovations were taken up. At Bhundri and Kadiyan Kalan, teachers highlighted the need for renovation of the flooring, as it was undulating. This was causing accidents, as students and teachers were tripping. For renovations, leveling and flooring was done, along with installation of tiles. There was an issue of water logging at Chaunta Koom Kalan and Kadiyan Kalan owing to the undulating flooring of the corridors and classrooms. Renovations to rectify the same was done to curb the issue of water logging.

Teachers at Nasrali, Purrain and Umaidpur also highlighted the requirement of renovating the shed or roof as it caused water seepage. Renovations were done at these schools which helped curtail the water seepage during the rainy season. The school at Bhundri did not have a functional hall for holding large gatherings and events, as heighted by the smart class teacher interviewed. Moreover, furniture was required as well to seat students. along with installations of benches to increase seating. At Chaunta Koom Kalan, the Principal highlighted the need for repair of the Midday-Meal room; as the net was broken and the animals were getting in and destroying the grain. At Hambran, the infrastructure was old and there was need for renovations; they faced challenges as there was shortage of government funds. To address these, plastering of the walls was done along with painting the classrooms. Initiatives for painting were also taken up at some schools, such as Bhundri Hambran, Kadiyan Kalan, Nasrali and Sherpur Kalan. Additionally, at Nasrali repair of the cycle sheds was also done.

These miscellaneous interventions have ensured positive changes. Lab teacher at Bhundri reported that the renovations ensured that the students were able to be seated better. Paintings have improved the visual appearance of schools.

3.4. TEACHING QUALITY

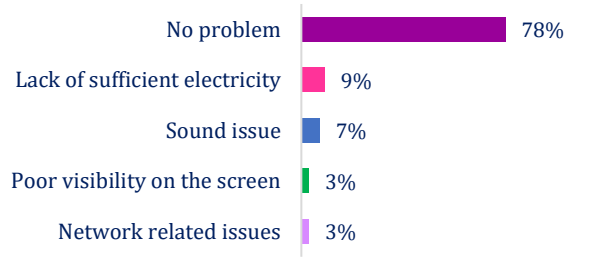
It is known that school infrastructure affects the motivation and interest of teachers to engage with students. Therefore, it has the potential to affect teaching quality. One of the most important infrastructure changes was the installation of smart classes. Almost all students who participated in the survey preferred the teacher using digital content for teaching instead of the traditional method of teaching used earlier.

99%

Students prefer that teachers use digital content for teaching instead of traditional method of teaching used earlier

N=180 [Students from schools with smart classrooms]

Challenges/ problems faced during class when teacher uses computer/digital content for teaching



N = 180 (Students from schools with smart classrooms)

Most of the students reported the digital content used in the smart class help understand the concept easily (98%) and they were satisfied with digital content-based teaching (96%), most of them were completely satisfied (82%). The study also found that the impact on the learning process on students was positive as all four parameters of learning (attention, learning, language/communication, and thinking/reasoning) evaluated as "good" increased drastically after the smart class installation (94-97%) as compared to before the smart class installation (22-42%). Largely students reportedly did not face any problems with smart class, except for a few who faced problems due to lack of sufficient electricity (8%), sound issues (7%), poor visibility on the screen (3%), and network issues (3%).

As an impact of improvement in overall infrastructure in school, majority of students reported that teaching quality has improved (79%).

Teachers reported that their efficiency of teaching increased after the school upgrade works. This is evident from the comparison of pre- and post-renovation scores given to this attribute which increased from 7.9 (pre) to 9.5 (post). The qualitative engagement done with teachers, it was highlighted that books and smart classes have helped students think creatively and understand things better. Owing to the innovative measure of teaching, students are engaging in the pedagogy quite interestingly. Students are able to hold meaningful discussions with peers and teachers. Moreover, teachers have also reported that students are able to speak out more clearly and express their ideas with least hesitancy.

3.5. SCHOOL PERFORMANCE

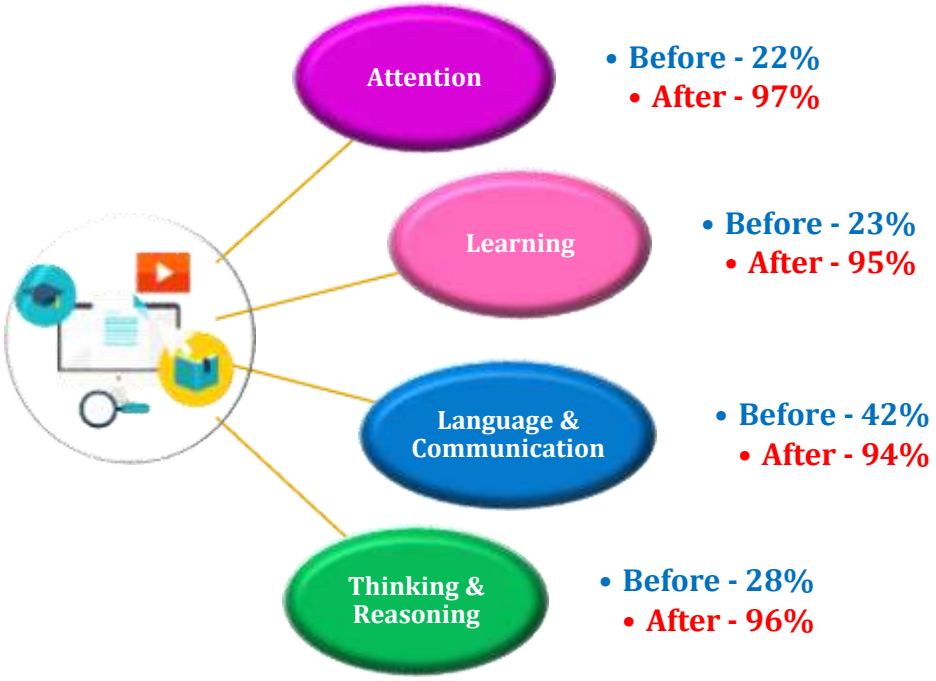
To assess the impact of school infrastructure improvement on key outcomes of school performance such as students' attendance, understanding of concepts, school reputation, and teaching quality were considered. In addition, the other parameters considered to assess school performance included changes in the learning process due to smart classes, improvement in pass percentage, and reduction in dropout due to school infrastructure upgradation were considered.

Both students and teachers' feedback on learning outcomes and schools' performance is presented below

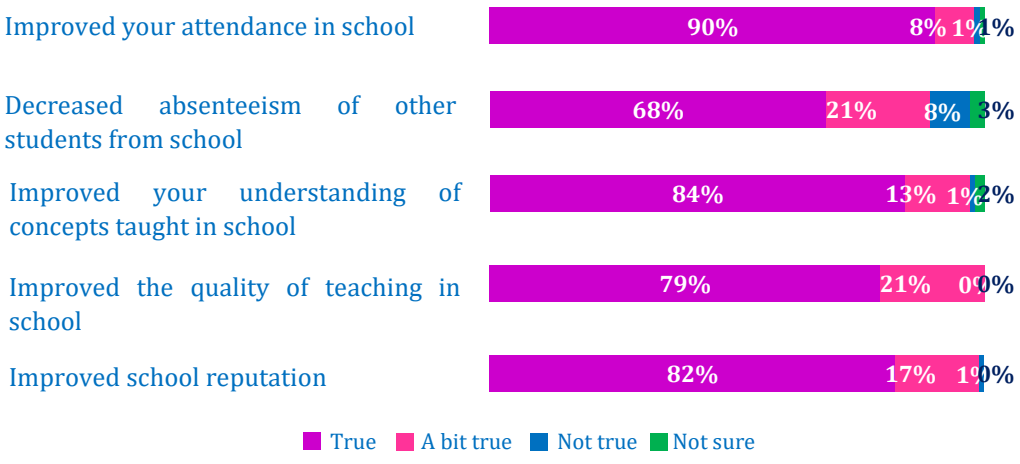
Students' feedback

- The **learning process** was impacted **positively** due to the **smart class** as the parameters of learning rated as "good" by the students (N=180) increased drastically after the smart class installation (94-97%) as compared to before it (22-42%).
- A **positive** change in **school performance** was reported by the students as there was an improvement in attendance, understanding of concepts, declining absenteeism, school reputation, and teaching quality after school infrastructure upgradation. Students (N=220) rated these parameters as "True" (67-91%) and "a bit true" (8-21%) when enquired about each of these.

Impact on Learning Process according to students– Before and After having a Smart Class



Impact of renovation of school on students



Teachers' feedback

- **Improvement** in students' **life skills**-related parameters was perceived by teachers (N=22) as the overall score for these parameters was **higher** after the upgrade work (4.4) than before it (3.7).
- Positive change in the **school performance** and **learning outcome** was evident as per teachers' perceptions (N=22), before and after the school infrastructure upgrade as the **score** for each of the parameters considered to measure the change, **increased** after the school upgrade works (6.9 – 7.5) as compared to before it (8.5-9.5).

Teachers' opinion on student learning and life skills-related aspects, before and after the school infrastructure upgradation *(mean score, out of 5)*

	Before	After
Learning/Comprehension/ Reasoning Skills		
Students able to understand concepts with clarity	3.5	4.5
Students able to solve problems	3.6	4.3
Students able to think creatively	3.6	4.6
Students able to make decision	3.6	4.2
Overall	**3.6**	**4.4**
Communication Skills		
Students able to say or ask questions	3.6	4.5
Students able to present ideas clearly	3.5	4.4
Students able to engage in discussion with peers and teachers	3.5	4.6
Students able to listen actively	3.7	4.8
Overall	**3.6**	**4.6**
Confidence		
Students speak up in class and gives answers	3.3	4.5
Students able to ask questions when does not understand something	3.4	4.2
Students feel confident enough to talk in front of a group	3.2	4.3
Students can ask for help from the teacher when needed	3.7	4.5
Overall	**3.4**	**4.4**
Cooperation/ Team Building Skills		
Students able to work amicably in a group	3.5	4.4
Students volunteer to perform tasks	3.9	4.5
Students able to share responsibility	3.7	4.5
Students' ability to understand the needs of others	3.8	4.4
Overall	**3.7**	**4.4**

Teachers' perception on changes in the interest, attendance and overall educational outcome of students, before and after the school infrastructure upgradation *(mean score, out of 10)*

	Before	After
Overall Learning	6.5	8.5
Interest in attending the school	7.0	8.9
Overall hygiene and health	6.7	9.1
Motivation of parents to send their children to govt school	7.0	8.9
Teaching efficiency of yourself or the staff	7.9	9.5
Physical activity and student involvement in sport activities	7.3	9.1
Pass percentage of school before and after infrastructure upgradation	87%	94%
Rate of student dropout	7%	3%

Apart from these findings, the perceptions of teachers about learning and teaching reported a change seen after school upgradation in terms of having more engaging classes due to smart class; getting community recognition as a smart school; enhancing enrolment; triggering language, vocabulary, and drawing skills through BaLA work and library books; prompting physical activity through sports kits, enhancing interest in subjects through effective use of science and math lab. The renovations done have been able to curb absenteeism and increased retention, as reported by teachers at Hambran and Umaidpur. Students have also reported to have scored better marks in exams. The renovations have also improved the outlook of the school.

> *"There has been an impact (of the renovation). Parents send their kids where there are more facilities, students would surely come."*
>
> ***– Principal, Chaunta Koom Kalan***

> *"Yes, there has been a change in the looks of the school. Our school is said to be the Smart School."*
>
> ***– Library Teacher, Hambram***

DISCUSSION – Analysis as per OECD-DAC Framework

Chapter 4

The OECD DAC framework has defined 6 evaluation criteria – relevance, coherence, effectiveness, efficiency, impact, and sustainability. These criteria provide a framework used to determine the worth of an intervention. They serve as the basis upon which evaluative judgments are made. This section analyzes the findings of the study as per the given evaluation criteria.

4.1. RELEVANCE

The relevance of the HDFC-FDP project of school upgradation is specified by the renovation and refurbishment of essential infrastructure needs expressed by the schools during the evaluation.

Poor Toilet facilities – The study found that there were multiple issues with girls' and boys' toilet facilities in schools concerning sanitation, hygiene, privacy, and accessibility issues for differently-abled persons. Broken floors, sheds, and pathways to toilets needed to be repaired. Toilets were not fully functional in a few schools.

Drinking water quality issues - Schools had water facilities before the intervention but the number of water taps was inadequate to meet the requirements of the students. Also, the groundwater, the source of drinking water in schools, was unsafe for consumption and students were falling sick, so the schools needed filtration/RO systems to get filtered clean water.

Lack of Smart Class facility: All nine schools needed a setup of smart classes. A couple of schools already with smart classes using projectors required more such facilities to match the school's strengths. A couple of teachers felt that the government grants were never adequate to meet school requirements, therefore, NGOs must support to meet the requirements of the school. The smart board provided now by NGO has more features, hence more helpful.

Untidy classrooms, Corridors, and Verandah: The study found that the classrooms were untidy and lacked well-decorated walls, with broken windows and plaster. Corridors and Verandahs were in debilitated conditions in a few schools and these would get filled with water at times.

The library, Science, and Math Lab lacked furniture/infrastructure- In some schools, there was no proper place to store or display books. Mice used to attack the available books. However, there was a need to have effective furniture and more books in most of the school's libraries to generate interest in reading and also students needed relaxation after reading syllabus books.

Similarly, the condition of the math labs was not good as there was no furniture and students had to sit on the floor. Instances of water logging in the maths lab were also reported in a couple of schools. It did not have any rack for keeping the apparatus.

Science labs in schools lacked maintenance, furniture, etc. The condition of the science lab was extremely bad in a couple of schools as it was no longer in effective use, rather instances of using it partly for storing wooden logs for preparing mid-day meals, trees growing out of it, were reported.

Lacked Sports Kits- Students were unable to participate in sports owing to the shortage of items to play. Also, the sports kits were needed to inculcate interest in students in sports.

Lacked BaLA work– Most of the schools under the survey lacked the BaLA (Building as Learning Aids) like innovative approaches of learning.

Other Infrastructural Issues (Corridors/Verandah/hall, MDM Room etc). The study found that in most of the schools, corridors/verandahs/halls/kitchens had issues including improper flooring and roof, flooring

with dents, drainage issues, water logging during rains, damaged sheds, water seepage, the pathetic condition of the MDM room (had broken nets, rats and other animals would get in and destroy the grain).

The school infrastructure improvement undertaken to address the above issues in schools was relevant in terms of the support provided by the FDP. The upgradation of infrastructure is universally known to have a positive impact on the student's learning and motivation to attend school. To enhance the efficiency of the school infrastructure upgrade work, the project duly mapped out the needs and requirements of schools.

4.2. COHERENCE

The FDP intervention to improve infrastructure in schools fits well in the country's National Education Policy that aims to provide effective and adequate infrastructure so that students have access to safe and engaging school education at all levels from pre-primary school to Grade 12. Adequate and safe infrastructure includes functional toilets, clean drinking water, clean classrooms and other learning spaces, sports room, computer lab, library, science and maths lab, etc.

4.3. EFFECTIVENESS AND IMPACT

To know if the intervention has achieved its objectives (effectiveness) and what difference the intervention has made (impact), the current study has attempted to measure the effectiveness and impact of intervention against the objective of school performance and learning outcomes of students.

The school performance and learning outcomes from the perspective of students were assessed considering parameters such as a change in the learning process (in terms of change in attention, learning, language and communication, and thinking and reasoning ability of students) pre- and post-smart class installation, improvement in attendance, understanding of concepts, school reputation, and teaching quality after school infrastructure upgradation.

Similarly, teachers' responses to learning outcomes parameters relating to life skills such as learning/comprehension/reasoning skills, communication skills, confidence, and cooperation/team building skills of students were scored for comparison between the pre-and post-intervention period. The other school performance parameters and learning outcomes compared referring before and after the intervention included overall learning, overall hygiene/health, motivation of parents to send their children to government school, teaching efficiency, physical activity and students' involvement in sports activities, pass percentage of students, and rate of student drop out.

- The **learning process** was impacted **positively** due to the **smart class** as the parameters of learning rated as "good" by the students (N=180) increased drastically after the smart class installation (94-97%) as compared to before it (22-42%).
    - Attention (pre-23%, post-95%)
    - Learning (pre-22%, post-97%)
    - Language & Communication (pre-42%, post-94%)
    - Thinking & Reasoning (pre-28%, post-96%)
- A **positive** change in **school performance** was reported by the students as there was an improvement in attendance, understanding of concepts, declining absenteeism, school reputation, and teaching quality after school infrastructure upgradation. Students (N=220) rated these parameters as "True" (67-91%) and "a bit true" (8-21%) when enquired about each of these.
- **Improvement** in students' **life skills**-related parameters was perceived by teachers (N=22) as the overall score for these parameters was **higher** after the upgrade work (4.4) than before it (3.7).
    - Learning/Comprehension/Reasoning skills (pre-3.6, post-4.4)
    - Communication skills (pre-3.6, post-4.6%)
    - Confidence (pre-3.4, post-4.4%)
    - Co-operation/team building skills ((pre-3.7, post-4.4%)

- Positive change in the **school performance** and **learning outcome** was evident as per teachers' perceptions (N=22), before and after the school infrastructure upgrade as the **score** for each of the parameters considered to measure the change, **increased** after the school upgrade works (6.9 – 7.5) as compared to before it (8.5-9.5).
    - Overall learning (pre-6.5, post-8.5)
    - Overall hygiene (pre-6.7, post-9.1)
    - Increased attendance (pre-7.0, post-8.9)
    - Increased motivation of parents to send their children to govt school (pre-7.0, post-8.9)
    - Increased teaching efficiency (pre-7.9, post -9.5)
    - Increased interest of students in sports activities (pre-7.3, post-9.1)
    - Increased pass percentage of school (pre-87%, post-94%)
    - Rate of student dropout (pre-7%, post-3%)

Apart from these findings, the perceptions of teachers about learning and teaching reported a change seen after school upgradation in terms of having more engaging classes due to smart class; getting community recognition as a smart school; enhancing enrolment; triggering language, vocabulary, and drawing skills through BaLA work and library books; prompting physical activity through sports kits, enhancing interest in subjects through effective use of science and math lab.

4.4. SUSTAINABILITY

School and classroom infrastructure upgraded under the FDP would require regular maintenance. At present, a team of support staff (mostly contractual) in the schools has the responsibility of ensuring the cleanliness of the school infrastructure. Usually, a teacher is given the additional responsibility of monitoring the work of staff (peon, sweeper, etc) engaged in school infrastructure maintenance and cleanliness using a day-wise chart prepared for the purpose. To ensure the sustainability of upgraded infrastructure on a long-term basis, schools may prepare a detailed maintenance plan that ensures community participation involving panchayats, community leaders, students etc.

CONCLUSION & RECOMMENDATIONS

Chapter 5

Previous research studies found that school infrastructure plays a vital role in a child's learning journey. Adequate and effective infrastructure contributes to a positive learning environment, enhanced academic performance, and holistic development. Conversely, inadequate infrastructure hampers educational outcomes and opportunities.

Recognizing the importance of school infrastructure, the Indian government has implemented several initiatives to improve education facilities nationwide, like a flagship program "Sarva Shiksha Abhiyan" focused on improving school infrastructure, especially in rural areas. Under the program, several efforts have been made to build new classrooms, provide clean drinking water and toilet facilities, and introduce inclusive education for barrier-free access. Additionally, the government has encouraged public-private partnerships to leverage resources for infrastructure development. Despite these efforts, rural schools in India still lack usable toilets, functional libraries, functional computer labs, science and math labs, and challenges related to digital infrastructure. The National Education Policy emphasizes the need to have functional and effective infrastructure to ensure engaging school education for all grades.

Given the above, the FDP initiative to upgrade school infrastructure in selected schools of the Ludhiana district was praiseworthy. The intervention fitted well being in line with the education policy. The project duly mapped out the needs and requirements of schools. The project adopted an efficient school-specific approach instead of any centralized approach to save on cost and time. The need-based infrastructure improvement activities undertaken in the school were largely found in good condition during the assessment. These included renovation and refurbishment of classroom infrastructure, installation of smart class with digital content, renovation of toilet flooring and door, repair of shed and pathway to the toilet, installation of drinking water RO system and water dispensers/taps, repair of water storage tank, providing furniture and books in library, providing furniture in science and math lab and distribution of sports kits.

Students and teachers perceived a positive change after school upgradation in learning and teaching experiences-

(i) Schools have more engaging classes now due to **smart classes** using digital content causing improvement in life skills of students viz. attention, learning, communication, and thinking skills;
(ii) The efficiency of teachers improved due to the **smart class** using digital content;
(iii) Schools got community recognition as a smart school;
(iv) Language, vocabulary, and drawing skills triggered through BaLA work and library books;
(v) Physical activity prompted through sports kits,
(vi) Interest in subjects through effective use of science and math lab provided with furniture enhanced
(vii) Parents willing to send their children to government schools
(viii) Students, especially girls felt secure and comfortable after school toilet upgradation and had access to clean water through RO system.
(ix) Enrolment and attendance enhanced after school upgradation.

Teachers and students experienced the benefits of good infrastructure and recognized the comfort that better learning spaces can bring in terms of motivation to learn.

RECOMMENDATIONS

The role of HDFC-FDP and NGO-SACH was to upgrade the infrastructure. The school now has a task to maintain this upgraded infrastructure in the school on a long-term basis. Despite the responsibility of maintenance and cleanliness has been assigned to contractual staff hired in schools. However, the school authorities may prepare a proper maintenance plan and involve community or panchayat and student committees for the long-term sustainability of this infrastructure. In this regard, NGO-SACH may consider revisits to the schools to extend their support if required. Schools may consider a formal plan for refresher trainings for smart class over a period time for new teachers by the trained staff.