Shiksha Sambal 2016-17

Annual Report

Submitted by VidyaBhawan Society

Shiksha Sambal Programme: Annual Report, 2016-2017

Shiksha Sambal, a joint initiative of Hindustan Zinc Limited (HZL) and Vidya Bhawan Society (VBS), is located in 57 Government Secondary and Senior Secondary schools in 5 districts (Udaipur, Rajsamand, Chittor, Bhilwara and Ajmer) of Rajasthan; it hopes to engage in a dialogic academic interaction with about 6194 children and teachers in these schools; it also hopes to engage with the community in these areas. The primary objective of the project is to provide academic support leading to conceptual understanding and significant improvement in the board examination results of these children. This support will focus largely onScience, Mathematics and English.Since the Class 10 Board examination results would be available only in June 2017, a comparative statement of the 2015-2016 and 2016-2017 results would be possible only in July 2017. However, as we would see below, tests conducted by us do show significant improvements in the learning levels of children.

This is the annual report for the first year of the project. It provides a brief summary of each quarter of the year. During the year, some of the landmark activities of the project included: a Residential Summer Camp (RSC) for school children, selection and orientation of Field Instructors (FIs), preparation of the FIs for intervention in the project, online and on-site support to FIs, demo classes for teachers and FIs, seeking support from HZL and the Government in the administrative and academic aspects of the project, seeking support from HZL employees to play the role of mentors for children, distribution of kits and initiation and expansion of libraries and book banks in the schools, conducting a baseline survey to examine the conceptual gaps in the understanding of children in Science, Mathematics and English, sharing baseline data with the FIs and teachers, celebrations for the Women's Day, selection of students for the Resonance Project and planning the collaboration between HZL, Resonance and VBS and selection of students and faculty for the 2017 RSC.

First Quarter (April-June, 2016)

Residential Summer Camps:

During the first three months of the project, we tried to understand the background and needs of children, to examine the kind of teaching-learning strategies that would work most effectively with them and to undertake the selection and orientation of Field Instructors (FIs) who would act as a bridge between the school teachers and the Vidya Bhawan Resource Team. It was decided to hold a month long residential programme for about 50

children.Vidya Bhawan Society (VBS) team would engage intensively with these children in different domains of activity including scholastic, sports, art, craft and cultural events. Contrary to our apprehensions, there was a great enthusiasm among parents to send their children to such a camp and we finally had 69 children in a residential camp of intense activity that lasted for 35 days. This camp reaffirmed our faith in the potential of children and in our capacity to take a major step forward in the direction of conceptual clarity, improvement in board results and in integrating scholastic and non-scholastic activities.

These 69 children came from the six different locations of the HZL *Sambal* project. There were 15 from Zawar, 10 from Debari, 12 from Dariba, 21 from Chittor, 4 from Ajmer and 7 from Bhilwara.Even though the number of girls (28 in all)was less than that of boys (41 in all), it is encouraging to note that 41 % of the total number of children was girls.The camp was organized in the Vidya Bhawan Senior Secondary School. It has a large clean campus with sports fields, basketball courts, gymnasium, spacious classrooms as well as separate hostels for girls and boys.

In the academic domain, the core areas - English, Mathematics and Science - were chosen on which intensive teaching-learning activities were planned during the camp. From past experience, we were aware that children's reading and writing skills are generally poor and this affects their performance in other subjects hence, Hindi was also included.Relevant

concepts were chosen in all subjects, suitable reading material selected and worksheets developed around them.

Although the children we were working with were all in class X, their learning levels differed significantly. Based on an initial assessment of their abilities, they were divided into three groups, namely, Groups A, B and C.We prepared materials accordingly for the three levels, basic, intermediate and advanced. Baseline and endline papers in all subjects were also designed.

Though the time table for the camp was long and densely packed, children found it exciting and challenging; in fact, towards the end of the camp, many children wished that the camp were of a longer duration. The camp hours were 5.30 am in the morning to 9.30 pm in the night, almost a 16 hour schedule with a lunch break and short breaks for breakfast and tea. There was a post-lunch rest period of two hours from 2 pm to 4 pm; given that it was peak summer time, this was a necessary and welcome break for all those involved in the camp. Subject classes of English, Science and Mathematics started at 8 am and each class was of one and a half hour duration. During the post-lunch and rest sessions, two hours from 4 to 6 pm were devoted to reading and craft activities. It was obvious that the root cause of most students not having conceptual clarity and not being able to do well in examinations was lack of reading comprehension; reading with understanding, vocabulary building and creative articulation remained the main focus of the camp. Evenings were devoted to sports and cultural activities.

Efforts were made to improve the conceptual understanding of children in Mathematics, English and Science. Within each group A, B and C, sub-groups of 3-4 children were formed so that each child could receive individual attention from the facilitator. In English and Mathematics, special attention was given to enable children to read and solve worksheets on their own. In Science, NCERT textbooks and *BalVaigyanik* were used as the base to understand instructions and conduct

activities and experiments. In the case of English, we used professionally prepared worksheets.

On 5th June, world environment day, children were taken on a day-trip to PrakritiSadhna Kendra. A two-hour long trek was organized and later children took part in a discussion with some experts on global warming. They asked a lot of questions and took an oath to protect the environment. A fire safety demonstration for children was organized by the Debari unit of HZL in which the causes of fire breakouts and their prevention were discussed. Children were also introduced to proper use of fire-fighting equipment. Children had several questions including job opportunities in the security and safety area. On the last day of the camp, a *BalMela (*children's fair)was organized. The fair location was enthusiastically decorated by the children and camp facilitators. The fair had several stalls around crafts, riddles, paintings, throwing rings, one minute shows etc. Parents of some of the children also participated in the fair.

The closing of the camp was marked by a cultural program in which the children presented plays, song recitals, dances that they had learnt during the camp. The dances included *Bhangra* and *Rajasthani* dancesperformed in traditional costumes. Children also presented a play depicting the importance of water conservation, directed by Vilas Jahnave. Musical recitals included one centred on *RaagAhirBhairavi.* Several of the children and parents came on the stage to share their camp experiences.

Subject-wise baseline and endline assessments were carried out. The results of the assessment showed significant improvements in all the three Groups. For example, in the case of Mathematics, only 17 children could score above 60 % marks in the Baseline but in the Endline,57 students scored above 60 % marks. Similarly, in the case of Science, only 38 % children could score above 60% in the Baseline assessment; this number rose to 59 % in the Endline. In the case of English also, improvement was noticed in the areas of vocabulary,

grammar, picture composition, reading comprehension and writing. Yet in all these subjects, it was strikingly clear that more work needs to be done both at the level of conceptual clarity and practice for board examinations. We learnt as much from the camp as the students or perhaps more. First of all, it became clear that such camps are necessary and go a long way in building a dialogic relationship between the learners and resource persons. It also gave us the confidence for holding still larger scale camps. We also noted that intensive efforts of this kind do lead to a quantum jump in the levels of learning among children.

Instructor Selection and Orientation:

Another major activity undertaken in the first quarter was the selection of 70 facilitators in schools, who will help children engage with English, Science and Mathematics. In order to build this 70 member team, we advertised for suitable candidates in local newspapers and also asked the HZL team for prospective names. Written examinations were conducted in May, followed by interviews of shortlisted candidates for final selection.Given the large number required and the high quality expected of FIs, we could find only half of the number of FIs needed for the project in the first round of selection; the remaining were selected over the next three months.

A10-day subject-wise orientation/induction training was conducted. The instructors were made aware of the project, its aims and objectives and expectations from them. Some of the sessions discussed alternative methods of teaching and how children think and learn. In the remaining sessions, chosen concepts were discussed, textbook chapters were studied and planning for the first month's work chalked out.

Second Quarter (July-September, 2016)

The first quarter of the project was used largely devoted to RSC and to the selection and induction of a new team of instructors who would work directly in the schools. The RSC was the highlight of the first quarter and gave us the hope and confidence that with the kind of strategies we had initiated we should be able to achieve the objectives of the*Shiksha Sambal* intervention in schools.

Preparation of FIs:

The main focus of the second quarter was to enable the newly recruited facilitators to help us achieve the objectives of the project. The primary work of these FIs involved the teaching of Science, Mathematics and English to students of Classes 9 and 10. Another function of these FIs was to see that the academic and infrastructural support provided by VB and HZL reaches the schools and is adequately utilized. To enable the FIs in their work, we decided to provide three types of support: orientation workshops, on-site support and on-line activities.

A round of orientation (1st phase) was conducted for the first batch. The Science team was oriented in the first quarter itself and for the Mathematics and English teams, the orientation took place in the second phase in June 26 to July 5, 2016. The first few sessions in these 10 day orientation workshops consisted of an introduction to the programme and its objectives,the nature and role of the school in our society and the philosophical underpinnings of our intervention in education. The remaining sessions focused on the respective subjects focusing on teaching methods, conceptual framework of different chapters, group work, experiments etc.For the remaining FIs, selected over the period of July-September, 2016, a second round of orientation was held from September 1 to 5, 2016. These FIs were directly deputed to schools after recruitment and it was observed during field visits that their work was not up to the mark as compared to the first batch. As it was not feasible to withdraw them from schools for 15 days, their orientation was of a shorter duration conducted over some school holidays and weekend to minimize work-loss.

While the FIs have undergone some orientation about the subject, they face many challenges in their day to day work – some academic and some administrative. In order to create a space for themselves in the school, FIs have to teach lower grades in some cases. To solve their academic and administrative problems and also supervise the FIs at work, we devised a system of on-site support where in subject teams from VB would visit the different sites of the project, visit the schools and at the end of the visit, holdsubject-wise and joint meetings with the FIs on the location.

While on-site support has greatly helped the FIs, wehave also tried to devise ways for constant communication between the team in Udaipur and teams at different locations. Subject-based whatsApp and email groups have been created. Instructors are being encouraged to interact and share their learning and queries.

During the Schools Visits, the VB subject teams, observe classroom transaction of FIs including the mode used, behavior with students, audibility in class, classroom organization etc. They also assess students and their participation addressing questions such as‘can read text, comprehend it, eager to question and answer, can follow instructions, can write etc.? They collect oral feedback from students, principal, subject teacher if any regarding FIs participation. They also discuss with staff and principal how to create space and render support for making kit available, get to teach at secondary level, get at least a period per day for preparation etc. and explore availability of laboratory or at least kit materials and library: space for both, types of materials, accessibility for students.

The general agenda of the meeting with FIs is to collect the planning of lessons taught so far and help them to prepare a plan for coming months; explore condition and participation of FIs in respective schools: support from school staff, workload, preparation for class, encouraging student involvement, etc. and discuss academic issues (specific difficulties faced by FI’s related to concepts of text and classroom organization) and give suggestions.

The field visits have proved useful in building the confidence of the head teachers in the new way of working and has also given us feedback on the sincerity, capability and motivation of the FIs.

During this period, we also explored the idea of mentorship involving regular HZL employees. A list of potential schools and their FIs was shared with 51 HZL employees who showed interest. This partnership we feel has a great potential.

Although not scheduled in the monthly events, VB also carried out a visit to the HZL site in Pantnagar to explore possible strategies of work in schools and was part of *SikshaSamabal* program recognition efforts.

Third Quarter(October-December, 2016)

The second quarter of the project ended in September, 2016. While the focus of work in the first quarter was familiarizing the schools with the project and with the VB team, RSC and FI selection, the second quarter marked the entry of the newly recruited FIs in the project schools and the beginning of direct school interventions. The third quarter aimed at consolidating our presence in the schools and at all locations. The main activities undertaken in this third quarter included the capacity building of the FIs in subject areas providing them

on-site and online academic and administrative support, conducting demonstration classes in consultation with them, holding planning meetings for future classroom activities, introducing libraries and book-banks at all locations, automatic digital recording of the attendance of the FIs, conducting baseline tests in English, Mathematics and Science, taking extra classes during the Diwali vacations in different schools and organizing winter camps in 4 locations. The distribution of Science kits was also started during this period.

Apart from the regular work in schools – classes by FI, school-visits by VB team and demo classes – there were two vacation slots in this duration for which activities had to be planned. Extra-classes were carried out for the children and winter camps were organized. Baseline tests were also conducted. The process of building book-banks/libraries and laboratories in each school was intensified.The work done by the HZL-VBS team was being noticed now. A team from FICCI visited the Dariba location on Oct 5, 2016. Another team from CII visited Chanderia location on Oct 19, 2016.

There was an effort to consolidate the work done in schools so far. We had placed 83 instructors in 56 schools across 6 locations - 30 FIs for Science, 27 for Mathematics and 26 for English teaching. The number of FIs fluctuated from time to time due to attrition, illness etc. For example, in the month of November, 75 FIs took regular classes. 2 FIs were on medical leave for some time, 1 had family emergency and 1 for personal reason could not attend schools regularly.

It was observed that on an average 80% of syllabus was completed by November. For the remaining months till March, we aimed at completing the syllabus and preparing students for exams.To solve academic and administrative problems and as well as supervise the FIs at work, we devised a system of on-site support where in subject teams from VB visited the different sites of the project and the schools and at the end of the visit held subject-wise and a joint meeting with all the FIs on the location.VB subject-guidance teams continued carrying out demonstration classes in the project schools. The idea behind these classes is to support certain weak FIs, provide them first-hand experience of alternative teaching methods and work directly with students to understand the school-situation. Demo classes were conducted in the month of November in three locations – Agucha, Dariba and Chittor.

The teams spent three days each in Agucha and Dariba and 6 days (in two slots) in Chittorgarh. The VB team taught in the classroom or planned teaching sessions with the FIs. In all three locations, students of classes 9th and 10th conducted experiments under the

guidance of VB team and the FIs. In English, VB team taught the students how to use mind maps for essay writing. In Math, they demonstrated to the FI on how to conduct a class on linear equations.

To encourage reading habits in FIs reading sessions were organised during handholding. 13 Science FIs wrote summaries of the reading at the end of the session.

In the initial months, the FIs were asked to assess the availabilityof additional reading and course-related material in their school. Most schools did not have any such provision. Therefore, we are incrementally trying to set up small libraries or book-banks (depending on availability of space) in the project schools. Books, whose reading levels were mapped according to the grade textbooks, were sent to 37 out of 55 schools. The books included dictionaries as well as story-books. For the remaining schools, the books will be sent by January. We are also receiving demands for simpler books and we are working on this requirement.

Baseline:

While the school exam results give us some idea of the learning levels of the children we are working with, they do not give us sufficient information about the intervention required and specific areas where more intensive inputs may be required. In order to gain this data, baseline tests were conducted on students of grades 9th and 10th in Science, Mathematics and English in the week of 13-19 October, 2016. We had more than 12,000 copies in all which had to be assessed minutely. Our FIs are not used to a conceptually mapped techniqueof assessment; so an orientation workshop on paper checking was organised on 20-21 October for all the FIs at VBS, Udaipur. The workshop sessions were planned to understand the nature of baseline questions, assessment criteria, and to build indicators to assess baseline papers attempted by the students. We provide here a glimpse of the baseline survey that we did essentially for our understanding of the ground level situation. The Mathematics paper covered 21 concepts, starting from basic to complex. Analysis revealed 4 problem areas - Algebra, Rational Numbers, Fractions (Addition, Division), Area (Problem solving) Data handling (Average) - common to almost all schools in all locations.The problematic topics in

Science appear to be those related to seed formation, separation, least count, laws of reflection and circulatory system.The English paper looked at reading comprehension, writing and grammar. Not surprisingly, students faced problems in several crucial areas.

We divided the children into different categories depending upon their understanding of different concepts. Category A consisted of children where 75 % children in a given school could understand 15 or more concepts; Category B of schools where 75 % children could understand between 10 and 14 concepts; Category C of schools where 75 % could understand between 5 to 9 concepts and Category D of schools where 75 % could understand only less than 4 concepts. In the case of Mathematics, only 2 schools could qualify to be in Category A (the corresponding number for Class 10 was 5 schools); 3 schools were in Category B (the corresponding number for Class 10 was 6 schools); 8 schools were in Category C (the corresponding number for Class 10 was 14 schools); in the case of remaining 27 schools of Class 9, 75 % children could attempt questions involving only 4 or less concepts (the corresponding number for Class 10 was 13 schools). It is perhaps because of the pressure of board examinations that children of Class 10 did better; we also know several students fail in Class 9 and are therefore not promoted to Class 10.In Science 16 schools were in the A Category and remaining in B where as in English only 5 schools are in the A Category. The baseline survey confirmed our understanding; there were major conceptual gaps. Intensive work and handholding was required with children, teachers and FIs.

Our first attempt was to arrange for extra classes. Initially it was not very successful but later

we could run extra classes in 28 schools and over 760 students attended these classes. We also organized a winter camp in 4 locations and it was attended by students of 5 schools. They were marked by high attendance (more than anticipated) and enthusiastic participation. The duration was from 26th – 31st December, 10 am to 3:00 pm. There was a focus on Science, Mathematics and English; time was also set aside for reading, writing, sports and science experiments. The following materials were provided to children: Notebooks, good quality folders, pens/pencils, worksheets and a compendium.

The HZL team ensured that at least six rooms were available for classes in each school during the duration of the camp; science kits and library books were provided. It also ensured that blackboards, stationery material, craft material, first-aid kit, clean washrooms for students (especially girls) and team were in place and were cleaned every day. Tea, snacks and drinking water was also available. Arrangements were also made for Xerox facilities and having a projector and sports material. Students of Class 9 and 10 were divided into 3 sections each and classes were held from 10 am to 3 pm.

Fourth Quarter (January-March, 2017)

The work done during the last three months i.e. the fourth quarter is briefly discussed below. We planned to share the baseline data with the FIs and teachers in order to focus on examination preparation and areas where there was a lack of conceptual clarity. There was now a greater need for on-site FI orientation and support; school visits were planned accordingly. In almost all schools, worksheets were solved and there was a discussion on some key concepts.More Demo classes were held in all schools and last year's board examination papers were discussed in detail. Model papers for pre-board examination were also prepared. The next two months were devoted to field support visits, kit distribution and examination preparation. Preparations were also started for the Resonance test which would focus on selecting some students to receive intensive training for appearing in IIT JEE test after their Class 12 examination.Resonance Academy was established in Kota in 2001 and has since become a leading player in guiding students for the IIT JEE, NEET/AIIMS, CA/CS, SCRA, NDA and CDS among others entrance tests.

Intensive work was undertaken on the teaching of English (focusing on direct-indirect speech, active-passive voice, literary terms, format of application and letter, lessons from text book and revision of class 10 chapters, grammar portion and model papers),Mathematics (revision of trigonometry, arithmetic progression, coordinate geometry and statistics through worksheets) and Science (chemical reactions, numerical sums related to electricity, lens and mirror and life processes). Several experiments were conducted with children including those of image formation through lens and mirror, structure of flower,

sound etc. Charts were made on the nervous system, heart, circulation of blood and internal structure of ear. For exam preparation, FIs and teachers focused on solving questions from workbooks and deskwork; an effort was also made to identify weak students and arrange extra classes for them. The first round of the Resonance Level 1 Test was conducted on February 7, 2017 and 2138 Class 10 students participated in the test; 575 were selected for the Level 2 test of Resonance. A total of 27 children qualified the Level 2 test of Resonance.

These 27 children will be tutored specifically in Physics, Chemistry and Mathematics (PCM subjects) for IIT entrance exams by the Resonance team. These students can appear for JEE only if they have 75 % marks in Class 12. Their subject in addition to PCM would include English and Hindi. Resonance-HZL and VBS have entered into an agreement to see this project through. These students have already been enrolled in Vidya Bhawan Senior School as regular students.

The following kit was distributed in all the 55 schools: For each school, two bookshelves,one safety kit, 2 fire extinguishers and 4 buckets with stand, one first aid kit and one Geometry kit were provided. More intensive field support was provided for English (reading comprehension, parts of speech, identifying direct and indirect speech, Modals), Mathematics (variables, algebraic expression in one variable, difference between algebraic expressions and algebraic equations) and Science (force and motion, graphs of motion,problems related to motion were given to children to solve,discussion on sign convention from the chapter on light,terms used in different chapters, process of drawing ray diagrams and their discussion, experiment with double convex lens and concave mirror, use of lens and mirror formula to find out the value of focal length among others).

During March 2017, several activities were organized to celebrate the Women Day (March 8, 2017). Various facilities available in the school were displayed: Science lab kit, library books, mathematics geometry kit, first-aid kit;subject workbooks including English, Maths and Science, VBSpublications – Annual Report, Voices from the Past, Vision document, and other publications like magazines, Pitara catalogue etc. There was provision for poster-making on the spot and students were free to draw or write something based on issues related

to women. Games and dance and song performances were also organized. There was a writing/ feedback corner where blank charts were kept for the visitors to leave their comments and to write down their thoughts.

A Review of the FIs was undertaken. The parameters of review were attendance, performance and participation in different activities and sharing of planning and report. The format has been given to FIs to record their self reflection and their experiences.

For the next month, it was decided that the FIs would select students for the summer camp for both the locations i.e. VBS and local schools; they will also continue classes with 9th till their exams. It was planned to meet the Principals to share mode of the project and role and responsibility of FIs in the new session.

Impact of the Program

In the first SLC held in Udaipur, there were significant improvements in the learning levels of children. In the case of Mathematics, only 25% children could score 60 % or above marks in the Baseline Test; the corresponding number for the Endline Test was 86 %. In the case of Science, only 39 % children could score above 60 % marks in the Baseline; the corresponding number towards the end of the camp was 59 %. The improvement in different areas of English including grammar and vocabulary was also noteworthy. Though the need for intensive inputs in the area of writing was obvious, there was enough evidence to show that many children had taken a quantum jump from almost no writing to composing coherent short essays. Abida, *with almost zero exposure to English*, could write a short piece on 'The Circus in the Village'. We reproduce it *without any corrections* (see Box 1).

Box 1

This is a scene of circus in a village. A joker is doing a dance. A man was driving a bicycle. A boy was rolling a ball. a elephant was playing. a boy and girl was jumping. a girl was sit on an elephant on the top. All others public was rich of a fun and laughing.

Observations of children reproduced in Box 2 will do credit to any emerging linguist. They show that children are curious and insightful and have an innate potential which is bound to flower in an enabling environment.

Box 2

- *How come 'know' is pronounced /no/; 'no' also as /no/ but 'now' as /nau/?*
- *Sir, what's the verb in 'I want to go.'*
- *Ma'm, the plural of 'child' is 'children'; in Hindi, plural of 'laRkaa' is 'laRke'. What is the English*

In Pandoli at Chittorgarh, children were simplyawe-struck by the wonders of a microscope. When the microscope was introduced, children realised that there was a whole new world that was invisible to the naked eye. They tried to keep a piece of hair, leaf, their own dead skin etc. to see how those would look under the microscope. When they were shown how to prepare a slide of onion or leaf peel and see it under the microscope, they were thrilled to see that their observations matched the diagrams given in their textbook.

One girl in Ramnagar in Zawar had serious problems in rote-learning the definition of a triangle. Members of the VBS team drew several figures on a piece of paper and asked her to identify the triangles among them. She did the task accurately and from there constructed her own definition of a triangle as a closed figure that has three sides, three vertices and three angles. One child in Agucha could not figure out why the sign in an equation should change as we move elements from one side to the other. When she was introduced to the technique of elimination of elements, it became clear to her that if an element is removed from one side, it also has to be eliminated from the other.

This year, *Shiksha Sambal* efforts led to some improvement in the board results also in most of its schools.However, some schools showed a marked improvement. Kanpur school (Zawar) which last year had a pass percentage of only 11% had a pass percentage of 91% in 2016-17. Similar improvements were noticed in other schools. Putholi (35% to 73%), Padla (32% to 54%), Medta (44% to 64%), Zawar (16% to 36%), Pandoli (37% to 60%), Kashmor (57% to 100%) andSoniyana (45% to 79%).

There were several instances of excellence in individual performances too. Sagar from Makarwalischool (Ajmer) scored 90 %,Reshma, Mona, Vikram topped their school results scoring 88%, 86% and 82% respectively.