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# 1. About us

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## **1.1 The Vandemataram Foundation (VMF)**

VMF was set up with the aim of improving the quality of government schools, especially in rural areas. Ever since, VMF has been organising and promoting a number of events and programmes to provide quality education to underprivileged students. Examples of such initiatives include: Aksharabhyasam (student enrolment into govt. schools), Village Education Development Committees (VEDC), SSC Preparation Camps, Prathiba Awards (awarding excellent students), Sri Sharadha Bala Samskara Kendras, LLL Program etc.

VMF is responsible for the execution of the programme we are hereby presenting.

## **1.2 The Vandemataram Educational Research and Training Centre**

VERTC is an educational, research and training centre based in Kalwakurthy, which focuses on designing scalable and sustainable programmes by carrying out research in pedagogies and trainings.

The programme presented in this proposal was developed by VERTC in partnership with SPR group, our research partner.

## 2. Executive Summary

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Based on both data we gained from external sources and our own research, we described here the very serious problems affecting the lower education system in India. More specifically we realised that one of the most serious issue affecting students' learning is the wide gap between pupils' expected and possessed competencies/abilities. In this proposal, we offer a detailed overview of our suggested solution to such problem. We have, in fact, designed a holistic programme and methodology with the aim of supporting students' learning and supplementing what the traditional schooling offers.

With this in mind, our three main objectives are to improve students' language, logic and life skills. We pursue such objectives by offering a number of activities which are described in the relevant sections. Most importantly, we also created a methodology related to the improvement of logic skills, which focused on offering students individual personalised learning. This is implemented with the creation of a supportive structure where students feel they need more help.

In this proposal, we are presenting an in depth analysis of our model, concluding by discussing what the expected results of the implementation of such programme are.

## 3. Background

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### 3.1 The state of lower education in India

Undoubtedly, the most reliable sources that can be used to get a realistic picture of the state of education in India are the ASER (Annual Status of Education Report) reports. These are annual surveys which are aimed to give a genuine approximation of enrolment and basic learning levels of children for each district and state in India. When looking at the last decades of reports, it can be observed that there have been some improvements in the areas of enrolment and physical capacity of schools, especially after the introduction of the Right of Children to Free and Compulsory Education Act in 2009 by the Parliament of India. However, the most dramatic figures in these reports concern children's learning.

### 3.2 The state of children's learning

To analyse this area, the reports adopt two main parameters, namely Reading abilities and Computation skills. Focusing on this area, the main finding of the latest report are as follows:

- 42.5% of children enrolled in third standard are able to read a simple paragraph at the first-standard level
- 27.7% of children enrolled in the third standard are able to solve a two-digit subtraction problem
- 43.3% of children enrolled in 8<sup>th</sup> standard are able to solve a 3-digit by 1-digit division problem

This data provides quite a dramatic picture of the state of children's learning in school (both private and public). This becomes even clearer when observing that these abilities are actually tested at a level which is two or even three tiers below the actual expected level of class in school. It is also important to compare the findings of this report with the previous ones. Generally speaking, especially in

regards to the abilities in question, an improvement of around 2% can be observed every two, three years. This is clearly insufficient, showing that current policies and practices are 'failing children on a massive scale'.

These findings have been corroborated by a number of other studies. For instance, in a study carried out in 2010 by Educational Initiative, it was found that the score which students averagely achieve in 4<sup>th</sup> standard in language and maths tests is half of the international average. Further, in a different study carried out by Das and Zajonc in 2010, it was shown that learning levels in India are falling below 43 of the 51 countries for which comparable data was available.

### **3.3 Our research**

Having been working on such issues for over 17 years, we at the Vandemataram Educational Research and Training Centre (VERTC) have carried out extensive research on the specific topic of children's learning abilities. In our last survey, in 2016, we tested 1072 students on 50 Basic Mathematical abilities. The survey showed concerning results, in line with the statistic quoted above. For instance, when looking at 9<sup>th</sup> standard students:

- only 40% showed the ability to add and subtract natural numbers;
- only 27 % showed the ability to multiply natural numbers;
- only 16% showed the ability to divide natural numbers

Based on the scale that we designed, another very important result concerned the progress of students from one year to the next. Our survey showed that 45% of the 9<sup>th</sup> standard students only learnt 1 ability per year since 3<sup>rd</sup> standard. Similarly, 51% of the 8<sup>th</sup> standard student only acquired an ability per year since 3<sup>rd</sup> standard. Once again, this is in line with the statistic set out above.

### **3.4 The roots of the problem**

When faced with such situation, the Government has decided to focus on three main areas where to allocate funding namely school infrastructure, teachers' salaries and students' benefits such as meals. The Planning, Allocations and Expenditures, Institutions Studies in Accountability (PAISA) Report showed that over 90% of the SSA budget was allocated to these three main areas. Nevertheless, by looking at the figures stated above, it can be observed how, investing in these areas, has only achieved very limited improvements as far as children's learning abilities are concerned. These short term solutions, such as providing students with free meals, are far from being an efficient tool to solve these important issues.

### **3.5 Students' variety of levels and the role of teachers**

One of the crucial issues that the short term solutions fail to identify and tackle is the variance in student learning levels and how this increases over time. Every student, in fact, is different in terms of two main factors namely pace of learning and pre-required abilities. Firstly, every pupil has a unique rate of learning, for instance a student may learn an ability in a day and another student may need a week to learn the same. Secondly, every student possesses a different number of pre-required abilities, for instance a 4<sup>th</sup> standard student may not know how to add numbers while his classmate may know how to do so. For these reasons, each student might need to be taught a different ability at a different time, as he needs a different amount of time to master such ability.

So what is the role of teachers in this learning process? Undoubtedly, even the most qualified teacher will struggle in handling between 30 and 40 students' different paces of learning and pre-required abilities. Teachers are required to complete a certain number of topics throughout the year as well as to achieve certain targets in regards to student's results. To achieve these, they work at a certain speed and, as a result, most students are likely to fall back and disconnect from what is being taught in class.

For all these reasons we, at VERTC, established the need to design teaching-learning practices that would help the students learn at their own learning pace and from their own learning levels. We further decided that such practices should be teacher-friendly and child-centred. With this objective in mind, after years of research and passionate hard-work, we have developed a tool as a model to assess the basic learning competencies of a student in mathematics. This tool does not test the academic standards the student has to attain at the end of an academic period, but will test the basic competencies the student needs to learn at ease to get connected with the teacher.

In the next section, we present our aim and objectives, giving an overview of the activities that we offer.

## 4. Aim, Objectives and Activities

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### 4.1 Aim

For all the reasons explained above, we have decided to focus our work on reducing the growing gap between the expected and possessed competencies which are resulting in disconnection between teachers and students by adopting well researched pedagogies developed by VERTC. We aim to do so by introducing a programme aimed to supplement the traditional schooling system with minimum learning abilities or competences in order to improve the connection between students and teachers. This is a programme for students who are attending regular schooling.

### 4.2 The need of the hour

We identified that the problematic disconnection between teachers and students is mostly caused by the pupils' lack of two expected competencies, namely *basic language skills*, such as reading and writing, and *minimum learning abilities*, such as additions, subtractions etc. As far as the former are concerned, it is clear that a child won't be able to progress academically in the other subjects when unable to read or write. Secondly, minimum learning abilities are pre-requisites to understand regular mathematics as well any other optional subjects (such as biological, physical and social sciences). Finally, along with academic skills, we also believe that it is essential for students to gain certain life skills such as management skills, teamwork and leadership skills, to face future challenges.

### 4.3 Objectives

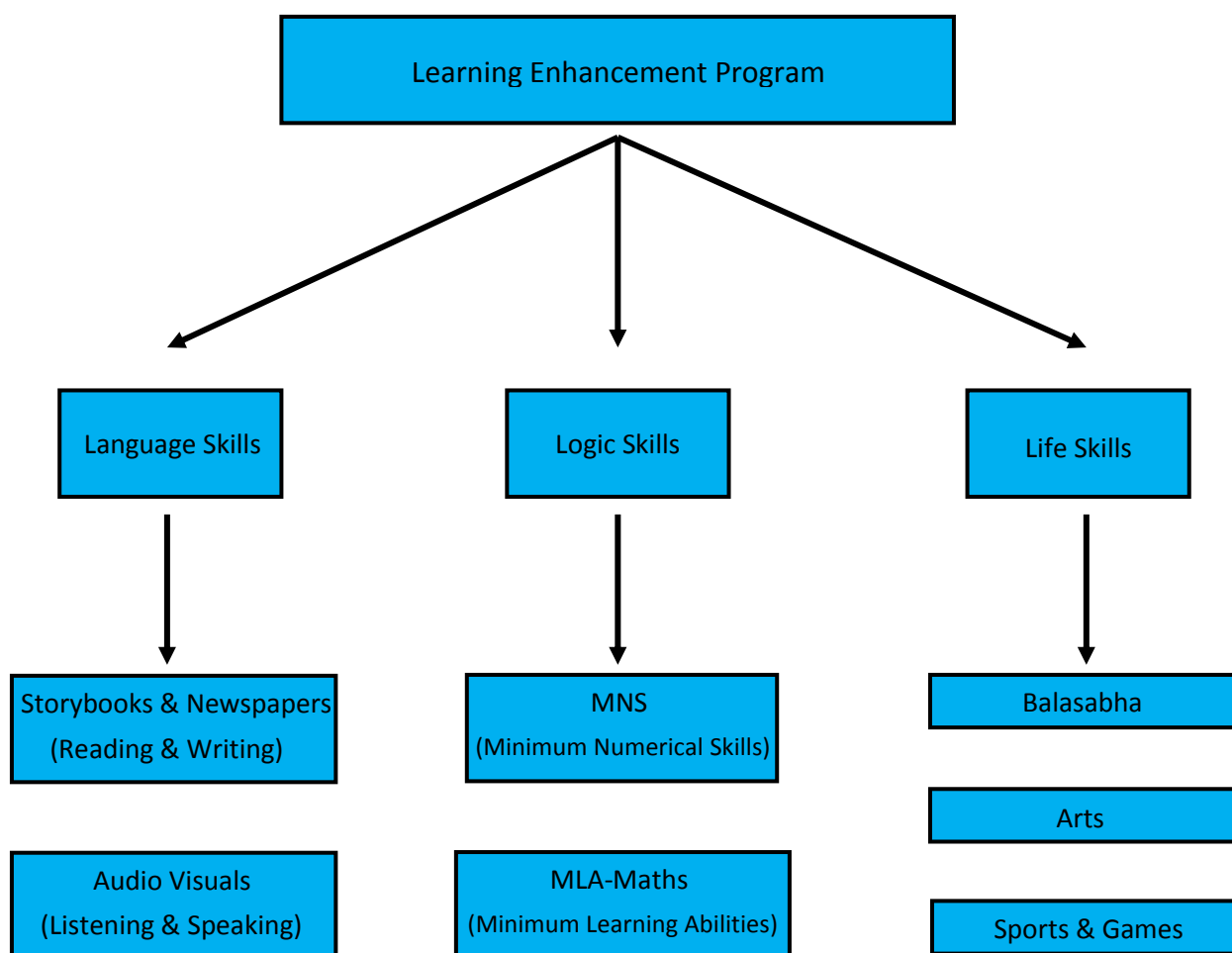
As a result of this analysis, we founded our model with the three following objectives in mind:



- a) Improving Language Skills: focusing on reading, writing, listening and speaking skills in order for students to be able to communicate effectively and progress in their other subjects.
- b) Improving Logic Skills: focusing on basic computational skills and minimum learning abilities/competencies as essential element to learn regular mathematics and sciences.
- c) Improving Life Skills: focusing on ethics & values, team work, leadership skills, management skills etc.

## 5. Description of project activities

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### 5.1 Language Skills:

*“The ability to read and understand is by itself a wonderful motivating factor which tremendously enhance the child learning abilities”*

- a) Storybooks reading: We encourage children to read books of their own choice at their own pace by providing them storybooks, based on their level.

Further, each student will be given a different storybook and, after completing this, he will be able to exchange it with another student's one. Students can carry the books wherever they go and read whenever they have leisure. We shall neither correct their mistakes nor ask them to reproduce or remember what they have read. Thank to this, reading shall become a habit for the students.

- b) Newspapers reading: At a later stage newspapers will also be made available for them. Reading newspaper helps developing the habit of reading further as it creates curiosity in regards to current affairs. Once inculcated, this habit will last a lifetime.
  
- c) Watching English movies/sitcoms: Children are also shown English movies/sitcoms. Listening to native English speakers will make the students pick up the vocabulary and pronunciation quickly.

*Assumption: The more we read the better we write and the more we listen the better we speak.*

## **5.2 Logic Skills:**

*“The children without basic competencies in mathematics cannot participate in teaching and learning process of their standard academic mathematics and sciences”*

- a) Minimum Numerical Abilities (MNS): MNS tests help boosting students' confidence and interest for mathematics by making them feel like they are improving. After exclusive preparation and practice with the MNS, eligible students are promoted to **MLA-Maths program**. Proficiency in the MNS test gives students a sense of accomplishment which works as a self-confidence booster for the MLA-Maths program.

- b) Minimum Learning Abilities (MLA-Math): Children are facilitated to master the basic essential competencies in mathematics which help them to stay connected with their classroom teaching. Their performance will be improved through personalised learning, peer teaching and questioning.

### **5.3 Life Skills:**

*“The ability to be creative and communicate properly is an essential skill that needs to be cultivated in every growing child”*

- a) Balasabha – This is an event which is organised and hosted by students themselves. With the balsabha students will develop leadership skills, organizing & management skills. Apart from organizing and hosting students also participate in variety of activities such as storytelling, singing, dancing etc.
- b) Arts – We encourage students to learn a variety of arts such as singing, folk dance, dappu, kolatam etc. Arts are a crucial source of creative skills, performing & presentation skills and by focusing in this area, students can develop sensitivity towards nature & their neighbors.
- c) Sports & Games – We encourage students to play sports & games daily. We believe that sports are essential for students in learning life skills such as team work, working under pressure, dealing with successes and accepting failures. Such activities also play an essential role in protecting the students’ physical and mental wellbeing.

## 6. Environment & Methodology

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### 6.1 Implementation of the programme

As explained in the previous section, in our model we recognise the importance of language, life and logic skills. We, therefore, offer activities to give students the chance to improve in all these areas. However, because of a number of constraints, currently our programme is modelled on mathematics and the improvement of pupils' logic skills. Notwithstanding this, our research and efforts are also focused on developing a methodology in different areas.

Nevertheless, for the purpose of this project proposal, we should present our learning environment and methodology as applicable to the development of logic skills.

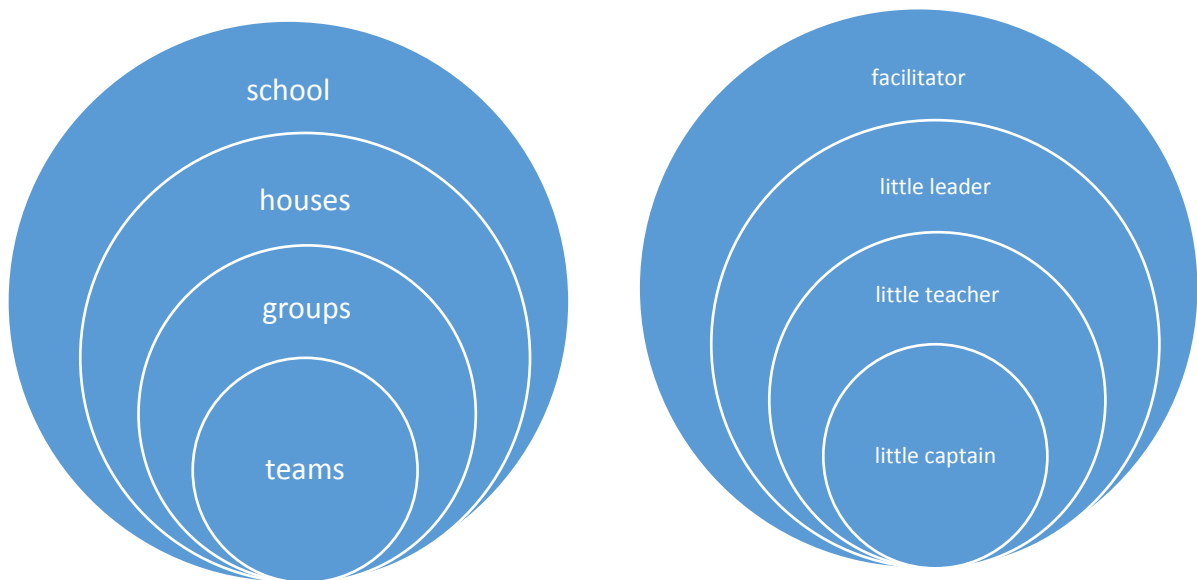
### 6.2 The learning environment

Based on the finding set out in section one, we came to the conclusion that a drastic change was needed in the learning environment where children are supposed to acquire skills and abilities. For this reason, we created an innovative model focused on two main elements, namely personalised learning and self-assessment. In our model there is no traditional blackboard teaching and the focus is on offering students tools for them to individually be able to learn at their own pace and level. However, we also realise that sometimes students are faced with questions that they are unable to answer by themselves. For this reason, we created a structure to support their individual learning progress.

### 6.3 Creating teams, groups and houses

The first step to create such structure is to carry out a baseline test. This consists of 50 questions, representing 50 minimum learning abilities. This test is aimed at both diagnosing children's abilities and at helping forming the teams, groups and houses.

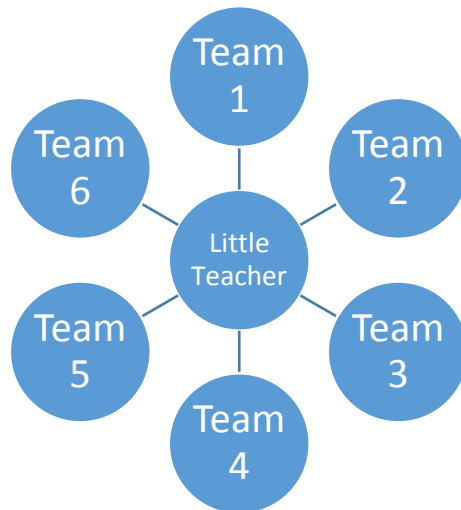
Once such test is carried out, in fact, we create a multi-level structure in order for students to be able to help each other in mastering new, different abilities. The division is as follows:



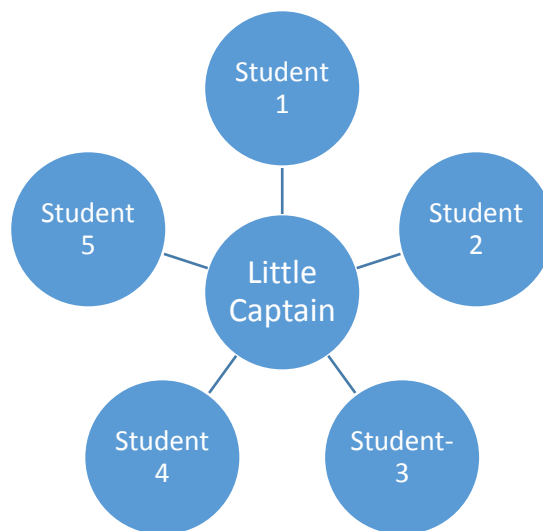
- 200 students are considered a school. For each school there is a facilitator, who is a qualified teacher, who will be responsible of managing the learning environment;
- A house is comprised of 2 groups, The most academically advanced student of the house is appointed as little leader ('LL');



- Each group consists of 5-6 teams. The most academically advanced student of the group is considered as little Teacher ('LT');



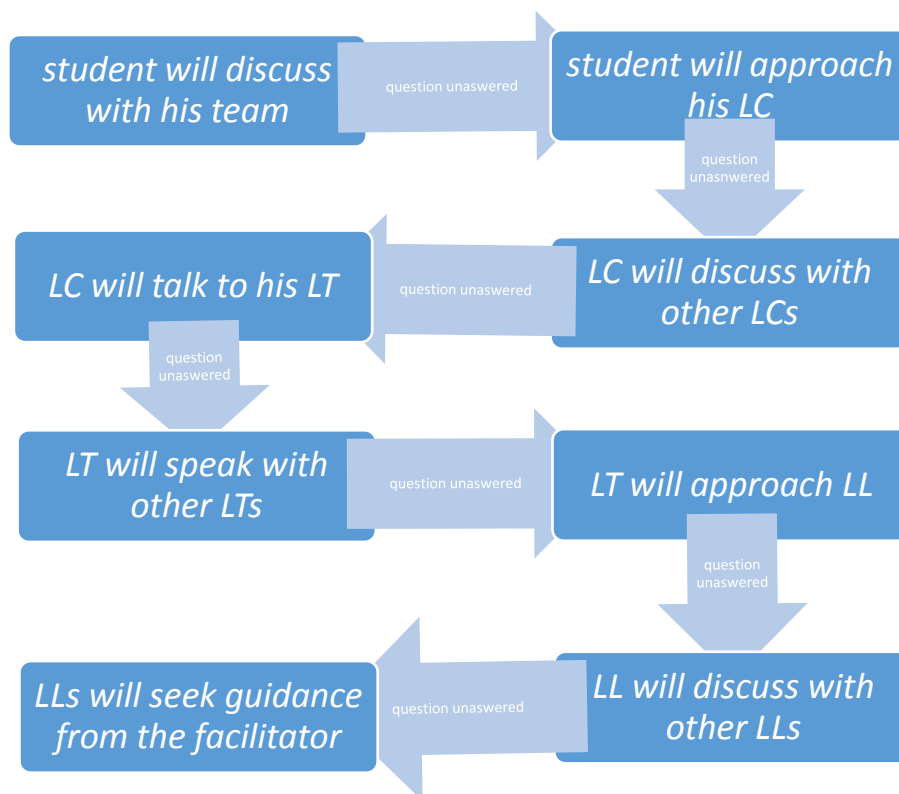
- Each team consists of 5-6 students. The most academically advanced student of the team is considered as little Captain ('LC');



This structure will create a stimulating learning environment where students can learn at their own speed and level.

However, where unable to solve a particular issue, a student will seek help from the other students in his team. If unable to answer, he will approach his LC. He, where unable to answer, will approach the other LCs. They, as a group, will discuss the issue and try to find the answer to the specific question. Should the problem still

be unanswered, the LC will then approach the LT and discuss the issue. If the LT is unable to answer, he will ask the other LTs to discuss the matter. Further, if the LTs are unable to come up with an answer, they will speak to the LL and together try to work out the answer. Ultimately, shall the little leader be unable to answer, he can discuss with the other LLs. If unable to answer, the LLs will discuss the problem with the facilitator, who can guide them to find the solution.



#### 6.4 The role of the facilitator

The facilitator plays a key role in this learning environment. He is a qualified teacher who will be responsible of the overall management of the environment. He will, in fact, facilitate the students' learning process by offering materials and



support when students are unable to solve a particular issue (provided all the steps set out in the previous section have been followed). He will also be responsible of tracking students' progress and of addressing odd trends, if any. We can then observe the distinction between a facilitator and a teacher in a traditional sense. While the teacher is engaged in full time blackboard teaching, teaching is only a minimal part of the facilitator's duties. When not engaged in such activity, the facilitator will be able to work as a researcher, focusing on understanding students, their learning process and on investigating the reasons why they may be struggling to progress.

### **6.5 The role of VMF staff**

In the initial phase of implementation of the model, the role of the facilitator will be supported by a VMF staff member, who may not be a qualified teacher but will have received in-depth training on the programme at VERTC before taking up his role. He will initially be acting as the facilitator and will be responsible for creating the learning environment (conducting baseline test, forming houses, groups & teams) and for initiating the learning process. Meanwhile, the actual facilitator (teacher) will be shadowing him and getting trained and will be responsible for solving student doubts. This process may take up to 2/3 years, depending on a number of factors, before the actual teacher can take up the facilitator role fully.

### **6.6 Methodology: the role of self-assessment**

As mentioned above, the second crucial element in our model is self-assessment. In our research, in fact, we did not only focus on the learning environment but also on the learning methodology. For this reason, we have designed a reliable tool as the measurable parameter that can access and analyse students' progress. One can easily access the abilities/competencies he has acquired and at the same time find out which abilities/competencies he still needs to gain.

More specifically, for each ability we have created 3 different worksheets for students to practice and learn. Student will choose a specific worksheet based on the abilities he possesses and using these sheets, he will exercise at his own pace and at his own level.

Overall, students will be tested every two weeks on the 50 required abilities and they will then enter their results in their record sheet for self-assessment. The cycle of testing, assessment and then practice will be repeated until the course is successfully completed.



MLA Mathematics: Level-2		W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
30	Decimal Fractions	Comparison	1														
31		Addition	1														
32		Subtraction	2														
33		Multiplication	2														
34		Division	3														
35		Converting decimal to fraction	2														
36		Converting fraction to decimal	2														
37		Value when expressed in powers	3														
38		Simplifying the numerical expression	3														
39	Algebraic Expression	Numerical value	2														
40		Addition	2														
41		Subtraction	3														
42		Multiplication	2														
43		Division	3														
44		Simplification	2														
45	Algebraic Equation	Solving ( Simple equations)	2														
46		Solving ( Simultaneous equations in two variables)	3														
47		Solving (Quadratic equations)	3														
48		Making the subject of formula	3														
49	Misc.	Finding the square root of a number	2														
50		Rationalizing simple surds	2														

Number of Abilities (max 50)																	
Total Credits (max 100)																	
Facilitator Signature																	
Mentor Signature																	
Parent/Teacher/Warden Signature																	



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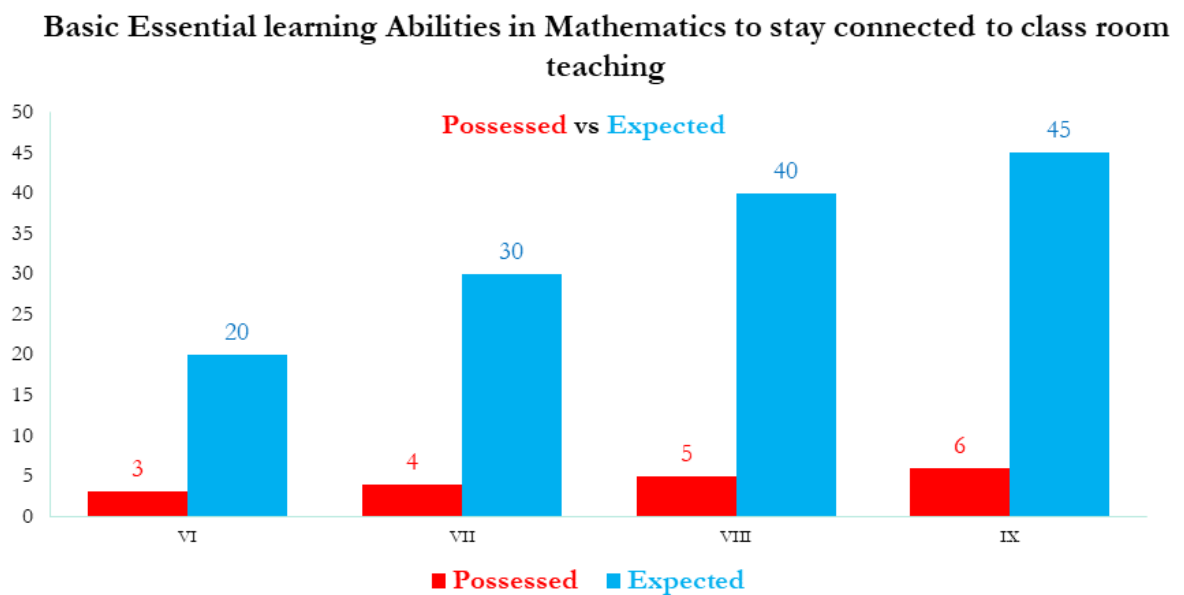
## 7. Expected Results

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When looking at the expected results of the model, we decided to focus once again on the gap between student's expected and possessed abilities. More specifically, we measure such expected results in relation to basic learning abilities in mathematics, using the 50 abilities aforementioned as a parameter.

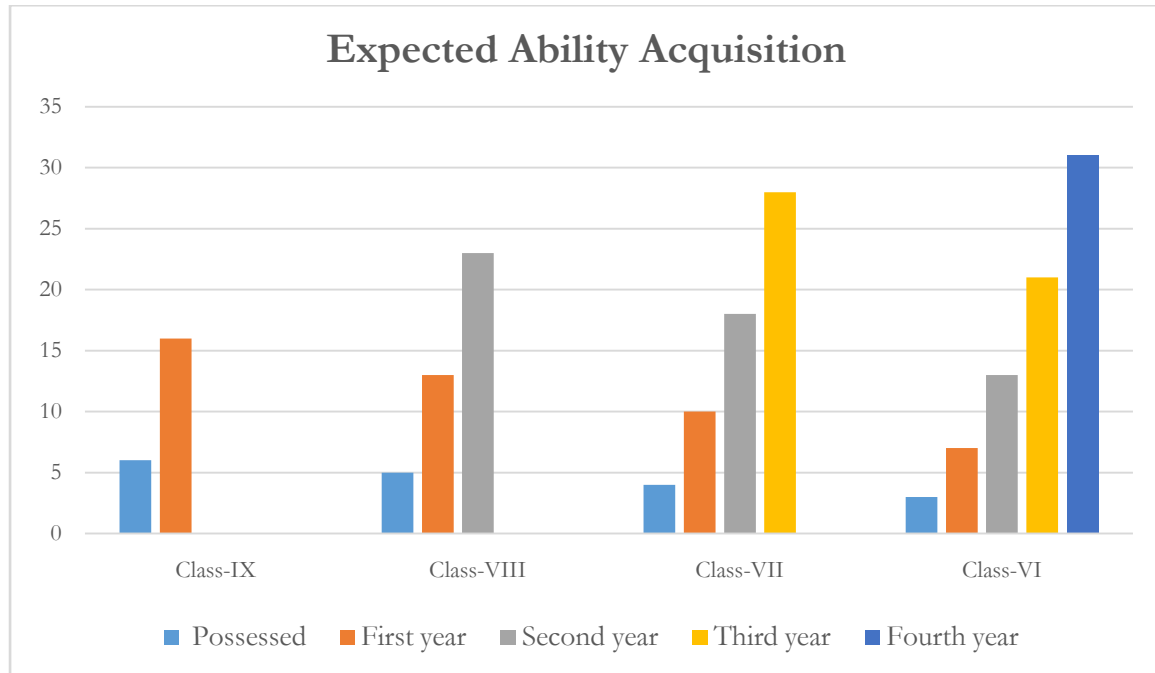
Firstly, based on our 2016 survey, we calculated the abilities that students possess in average, and compare this with what is expected from them.

The following graph shows the discrepancy between the two parameters.



Without having these expected basic competencies the students get disconnected to their class room teaching

However, based on our statistics, we expect our programme during the first year, to have a crucial impact on such gap. In the following graph, we show what our expected results are.



For all these reasons, we believe that our model, methodology and learning environment can positively impact students' learning experience and acquired skills, bridging the gap between what is expected from them and what abilities they can actually gain from their education.

*In conclusion, we are also working closely with state governments, SCERT and government teachers, by taking part in workshops and training opportunities they offer, with the aim to advocate and raise awareness about our proposed model. Ultimately, we hope to reach out to all the government schools in our state and make a positive and drastic change in our education system.*