Student Progress Tracking System

EI Working Paper Series - Issue 4

How a system that monitors student progress across years (academic and non academic) can help improve educational quality

Educational Initiatives (EI) believes that significantly improved student learning can happen only through systematic research into learning which includes assessment, as well as areas like misconception research. This working paper series will share learnings from various past and present EI projects as well as path-breaking work in these areas elsewhere in the world. Please write to us at assessment@ei-india.com for questions or comments.

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WHY IS A STUDENT PROGRESS TRACKING SYSTEM IMPORTANT?

A Student Progress Tracking System (SPTS) is a computerised system to track student progress in both the scholastic and non-scholastic domains across years. The system is built on a comprehensive database of students, teachers, schools and ideally would be accessible at the school as well as at various central levels (group of schools, block, district or state level, etc.) It essentially provides visibility of the holistic development both of individual students, as well as that of groups of students. Thus, SPTS can be very useful both at the level of individual students and from a systemic, educational planning level.

Though individual schools could also benefit from such a system, the real beneficiaries will be group schools (like the Kendriya Vidyalayas or DAV Schools) and of course government school systems at a state, district or city level. Many benefits can be achieved simply by having systematic databases of students, teachers and schools; however, the added benefits when learning and non-scholastic development is tracked can be significant.

Systems like the SPTS represent a philosophy of using data to make informed decision-making at every level. This can change how systems and institutions function increasing transparency, accountability and research-focus. Of course, in order to be effective, this does call for mindset changes as well as capacity building at multiple levels.

In India, we believe that we have reached a stage in our development where non-availability of granular and accurate data (when and where needed) alone, can become a roadblock to development.

SPTS can provide the infrastructure that allows slicing and dicing of information on the holistic development of school children in every conceivable way for informed decision making.

## BENEFITS OF A STUDENT PROGRESS TRACKING SYSTEM

### 1. FOR POLICYMAKERS:
- Availability of accurate data at granular (student, school or block level) as well as aggregated levels (district, state or national level) at the click of a button can significantly impact effectiveness of policy measures.
- Over time, the system will enable detection of educational learning patterns that show the effectiveness of specific textbooks, educational methods or policies by providing longitudinal data for comparison.
- Various kinds of patterns can be identified – simple ones like students or schools that need support, and also complex ones such as, students whose educational attainment in the higher levels has not kept pace with the promise indicated in the lower grades.
- Each child and teacher will be tracked with a unique ID (compatible with the National UID scheme)

### 2. FOR SCHOOL MANAGEMENTS AND SCHOOL HEADS:
- The SPTS easily allows a school to identify its strength and weakness areas vis-a-vis all other schools. This allows specific resources to be focused for those who need them most.
- Data can be drilled down to the level of a specific student and a specific question or talent; school-level data can also be stored and retrieved.

### 3. FOR TEACHERS:
- Such a system allows action and remediation, school level assessments, progress monitoring, talent identification etc.
- Provides easy access to past data, for example the performance in language of a class 8 student when he was in class 5!
SALIENT FEATURES OF THE SPTS

Educational Initiatives has developed SPTS both for internal use (tracking performance data of lakhs of students on the ASSET test) as well as for partners (Bhutan’s Royal Education Council). Each system is customised to specific needs and hence the features below refer to a generic system:

- Is either built on, or includes a comprehensive database of students, teacher and schools.
- Multi-language display capabilities to facilitate usage at local levels.
- Schools can update assessment and other progress data regularly if they have access, else send it periodically to centralised office for updating.
- Authority based access to different users – educational planners, teachers, principals (for example, a principal would have full access to the details of his own school but can only view average data for other schools). Schools can choose to keep some data private.
- Provision to record non-academic progress also like sports, arts.
- Ability to automatically handle change of class of student at the end of the year, based on preset date.
- Advanced search capabilities allow searching for data based on complex criteria.
- Ability to add modules to function like teacher professional development, a statistical module to collate data, etc.
- Each student is tracked uniquely even if he shifts school, state, etc.
- Advanced student learning analysis module which allows provision to view question and question-wise performance if recorded.

ACCESSING SCHOOL, TEACHER OR CHILD DATA

Systems like the SPTS would allow advanced querying to retrieve information using simple or complex criteria. The system is designed to be easy to use for common queries, yet powerful enough for the advanced user to extract information.

The query above simply displays the list of all teachers of a particular school. (All the data shared in this working paper is drawn from real working systems – however all names have been changed to protect identities.)

Detailed information regarding teacher qualifications, the subjects and the classes they teach and can teach, etc. are available in the system. In many places, the system is found to very useful for planning training workshops for teachers.

Similarly, data regarding student interests, strengths and weaknesses and achievements – apart from actual test scores (question-wise if available) - are recorded in the student system. For schools, information like type of school, number of students and teachers are recorded.

The querying interface is designed to be easy to use and also allows common queries to be saved for future re-use.
A powerful feature of the SPTS is the way it can show different and detailed views of student data. For example (see below), starting with the State level, the data is ‘drilled down into’, right down to the school level and beyond (as shown in the following pages).

Starting at the District level (Jashpur), data for Block Jashpur is retrieved. Data for village Jashpur (Gamhiya) is then retrieved to get the performance of the K.A.P.M.S Jashpur Nagar MSSI. (Detailed information about the school follows on the next page.)

In Bhutan, the Education department used to collect information of all students, teachers and schools manually on annual basis. This method was time consuming and repetitive as teachers and principals had to fill the forms manually and send the data every year to a centralised location. In 2007, the Royal Government of Bhutan established the Royal Education Council to spearhead and fast track the process of educational reform in the country. As part of this process, Educational Initiatives developed a Student Achievement Tracking System for Bhutan. The system has information on all the 523 schools of Bhutan with more than 150000 uniquely identified students and more than 5000 teachers in the country. The system tracks student progress in scholastic and some co-scholastic areas and manages school and teacher information. An immediate benefit of the system is that the process of collecting student details every year (which introduces errors with every collection) is now replaced by a system where only changes have to be notified, reducing effort at school and central level and also increasing data accuracy.
DETAILED SNAPSHOT OF LEARNING AT SCHOOL AND STUDENT LEVELS

The SPTS system allows a detailed analysis of the school’s performance – subject-wise, class-wise and student-wise. Each of these can be analysed further and also benchmarked with the performance at the national or state or district level. Average performance of the class is shown in each subject, and the performance of each child, both in terms of the actual score as well as the percentile scores at the subject level, are provided.

The performances of the school, the class and that of individual students are provided in the summary school report shown above.

Note that drilling down to the level of individual students (as shown above) and individual questions (as shown in the next page) is possible. Starting from the consolidated national performance, the performance of an individual child on an individual question can be accessed in a logical and step-by-step manner.

The report on the left shows class teachers the performance in skills by the class as a whole. The data can be seen in comparison to the regional average or to the past performance of the class.

The report on the right is the detailed question-wise report for a particular student. Clicking the question number shows the actual question.

For each question, the skill tested, the student’s answer, the correct answer and the percentage correct for all students of that class nationally are shown. Students and parents may also access this data.

Note: Names of students are changed to protect their privacy.
ANALYSIS OF EDUCATIONAL PERFORMANCE

The SPTS system also provides valuable data for teachers and researchers at the level of skills and individual questions. The report below, for example, shows the actual questions in the class 4 Maths paper and the student performance in each of those questions. The graph is an extremely powerful tool that can be used to identify the specific misconceptions that groups of students at different levels of ability may have. Other representations of the data are also provided by the system.

TRACKING PROGRESS ACROSS YEARS

The system can track the national, state, district, school or student performance year on year for each subject either on an absolute basis or against the national performance.

MONITORING OF CO-SCHOLASTIC PROGRESS

Co-scholastic progress of a child is also tracked each year by the SPTS. The system helps the teacher to record various details about each student on a regular basis. (The teacher is automatically recommended to record the same for different students every day.) These include life skills, attitude and values, sports, art, health, physical education, etc. Teacher can also give individualised comments to each child on talents, personality characteristics etc. Thus, this can be useful in Continuous and Comprehensive Evaluation as well.
### Other Useful Features of the SPTS

Many useful features allow the SPTS system to be used powerfully in a large school system. Some examples are:

1. **BULK UPLOAD OF STUDENT ASSESSMENT DATA:** The interface below allows for scores in any test – a school test, or a Board Exam or a National Test like ASSET - to be uploaded into the system. If available, details of questions and question-wise scores can also be uploaded!

<table>
<thead>
<tr>
<th>Specify Following Details To Upload Test Data (Step 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you want to enter marks per question?</td>
</tr>
<tr>
<td>2. Is the test common across all schools?</td>
</tr>
<tr>
<td>3. Select total number of subjects</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specify Following Details To Upload Test Data (Step 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Subject 1:</td>
</tr>
<tr>
<td>2. Subject 2:</td>
</tr>
<tr>
<td>3. Subject 3:</td>
</tr>
</tbody>
</table>

   Please upload CSV data file in the following field sequence (Step 3)

   CSV Data File Field Sequence: CTS Number, Student Name, School Code, School Name, Class, Serial No, English,Absent, English Q1 To.

   | Upload CSV Data File: | Browse... |

2. **BULK UPLOAD OF NEW STUDENT RECORDS:** This interface allows a school or educational administrator to bulk upload student details – for example, new students joining the school or system in class 1. Similar bulk promotions are also possible at the end of an academic year.

![Bulk Upload Interface]

<table>
<thead>
<tr>
<th>Bulk Upload (Class 1 Students)</th>
</tr>
</thead>
<tbody>
<tr>
<td>District:</td>
</tr>
<tr>
<td>&lt;All&gt;</td>
</tr>
</tbody>
</table>

   File(.csv): | [Browse... | Upload File |

   **Conditions to be observed**
   - File must be in CSV format. You can create file in MS Excel and save it as CSV file.
   - All dates should be in dd-mm-yyyy format.
   - First row should contain headers; the headers should exactly be in the sequence shown below: (* indicates mandatory fields.)

   | Class, Section, Roll No, First Name*, Last Name*, Father Name*, Mother Name*, Gender (M/F)*, Date of Birth*, Phone, Email, Physically Challenged (Y/N), Mother's Tongue, Nationality, Occupation of Father, Occupation of Mother, Address, Village Name, Block Name, Distric T Name, Child Village Name, Child Block Name, Child District Name, Hobby 1, Hobby 2, Hobby 3, Strength 1, Strength 2, Strength 3, Weakness 1, Weakness 2, Weakness 3 |

3. **INTERFACE AVAILABLE IN MULTIPLE LANGUAGES:** The SPTS is also available in Hindi – other language versions can also be provided.

<table>
<thead>
<tr>
<th>छात्रों की कक्षा-अवलंबी देवनागरी के लिए विभाग मुद्रे या विभाग मुद्रे</th>
</tr>
</thead>
<tbody>
<tr>
<td>उन छात्रों की ऐसे पी., टी., ऐसे आड़ी जाने, जिसके अवलंबी/पिस्तूली बाजा से ल जाता हो।</td>
</tr>
<tr>
<td>(एक से अधिक संख्या अंकित करने हेतु अनुच्छेदक का प्रयोग आवश्यक है)</td>
</tr>
<tr>
<td>उद्धरण: 500000014, 2100000304</td>
</tr>
</tbody>
</table>

   The name of the school can be typed directly and will be intelligently completed by the system.

### Steps Taken by Indian Government for Student Tracking

In November 2009, the Union HRD Minister spoke about introduction of unique identification numbers for monitoring the performance of all students enrolled for primary education. (Source: http://www.government.in/site/Website-a-must-for-educational-institutions-india).

These initiatives bring to the fore the need for computer-based systems like Student Progress Tracking System in helping to achieving quality education.

The Unique Identification Authority of India is an initiative to provide every Indian citizen with a unique identification number. Provision of unique IDs to every student is a pre-requisite to track the performance – scholastic and co-scholastic – of every student and thus also the education system itself.
This working paper is about a Student Progress Tracking System which is an online system that tracks year-on-year progress of students on scholastic and co-scholastic (co-curricular) skills. It either includes or sits on a comprehensive database of students, teachers and schools and includes login-based secure access, advanced data querying at the click of a button, modules for analysis on student performance, etc. The system can help policy makers, school managements and teachers get accurate data for taking timely decisions. Such systems are becoming critical if large scale education systems have to move from providing access to providing quality education.

We are an educational research organization that focuses on learning research through assessments. EI has been started by a group of IIM Ahmedabad alumni with first-hand experience of setting up and running educational institutions. It has been formed with a mission to work towards qualitative improvement in India’s educational system and our vision is “A world where children everywhere are ‘Learning with Understanding’.”

PROJECTS OF EI:

Andhra Pradesh Randomised Evaluation Study (2004 onwards): Done in partnership with Harvard University, Azim Premji Foundation, World Bank and the Government of Andhra Pradesh, this is a longitudinal study across 8-9 years and covers currently 100,000 elementary school kids and measures the impact of various inputs (e.g., block grants, additional teachers) with outcome-based teacher incentives.

Assessment of Student Learning in Sarva Shiksha Abhiyan – RGSM, Chhattisgarh (2008 onwards): The test was developed in Hindi and administered to approximately 3 lacs students in about 1900 schools in 16 districts in Chhattisgarh states. The tests have already been conducted for students of class 3 to 8 for Language and Maths and the report is in final stages.

Municipal School Benchmarking Study (2004-2007): Supported by ICICI Bank, this study assessed learning in 35,000 municipal school students from class 2, 4 and 6 across the 6 biggest towns in each of the states - Gujarat, Andhra Pradesh, Rajasthan, Chhattisgarh and Uttarakhand.

UNICEF Learning Assessment Study for Quality Education (2005-2006): assessed mathematics and language acquisition among primary school children in the UNICEF quality package schools in 13 states of India. The tests were standardised across 9 languages and involved very intricate development cycle involving language experts from all over India.

Teacher Needs Assessment (2008 onwards): is a census study that has been initiated by the Royal Education Council, Government of Bhutan. In this project all teachers of Bhutan are assessed for their general ability, competence in subject knowledge and pedagogical practices.

Student Learning Study (2008-2009): Supported by Google Inc., this study is currently ongoing and assesses student learning in 21 states of India. Nearly 190,000 students in classes 4, 6 and 8 are tested for learning in Language and Maths in rural and urban govt. schools.

EI’S PRODUCTS AND LEARNING SOLUTIONS:

ASSET: is an objective-type, multiple-choice test for students of Classes 3 to 10. It is a scientifically designed, skill based assessment developed in India for Indian schools. It assesses students’ level of proficiency in the skills and concepts underlying the school syllabus and provides them feedback about their strengths and weaknesses. Know more about ASSET at www.ei-india.com

Mindspark: is a computer based self-learning programme that helps the child improve her skills. It allows each student to follow a learning path that is based on her need. Mindspark is currently available for Maths for classes 1-10 in English version. Mindspark can be accessed at www.mindspark.in.

Rural Mindspark: Hindi version is currently available on demand for some Maths modules. Contact EI to know more about other language versions and modules.

Some Partners / Clients

| Google Inc. | Government of Andhra Pradesh |
| Rajiv Gandhi Shiksha Mission, Chhattisgarh | Royal Government of Bhutan |
| WIPRO Applying Thought | World Bank |
| Michael and Susan Dell Foundation | Suzlon Foundation |
| UNICEF, India |

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