

# **Computer Aided Learning : Making Assessment Fun For Children**

**A study in West Godavari district of Andhra Pradesh**

**May 2004**

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## Place

Eluru, a town famous for its woolen pile carpets, is the headquarters of the West Godavari district in the southern state of Andhra Pradesh in India.

West Godavari district covers an area of 10,800 sq. K Ms with a population of 3,796,144. It has the highest density of population in Andhra Pradesh after the state capital Hyderabad. West Godavari has a gender ratio of 992 females for every 1000 males, higher than the average for the state of 978. The school going children number 289,948, accounting for about 5% of the student population in Andhra Pradesh. The district has a literacy rate of 73.95%, the second highest among Andhra Pradesh after the state capital of Hyderabad.

West Godavari district has 2,436 primary schools and 277 Upper Primary schools.

## The setting

The "Project Rural e Seva (e Services)" of the Government of Andhra Pradesh is a tool to bridge the digital divide. Using information technology, it provides a access to various C2C (citizen-to-citizen) and C2G (Citizen-to-Government) services to the people in rural areas.

e Seva kendrams (centers) were set up in all 46 Mandal head quarters of the district. 15 Self Help Groups (SHG) and 21 rural youth trained and supported by the district administration run these centers. These centers offer a variety of services such as collection of electricity bills, issue of various certificates to the citizens and handling grievances against the administrative machinery.



Inspired by this concept, village public telephone centers (ISDs) were converted into Rural Service Delivery Points (RSDPs) by upgrading them into internet access centers with a computer and accessories. These centers also provide C2C and C2G services similar to the e-seva kendrams. There are 144 RSDP centers in West Godavari district.

Within a short period, these centers have gained tremendous support from the rural population, and have become the center of activity.

## **e Seva / RSDP Centers as Computer labs for schools: without incremental investment**

e-Seva / RSDP centers were primarily being used in the mornings, before 11.00 AM and later in the day, after 4.00 PM, with a noticeable slack during the noon time of 11.00 AM to 4.00 PM. Seeing this window of opportunity, the District Administration of Eluru in partnership with Azim Premji Foundation initiated a simple model to leverage this time slot for education of schoolchildren. Azim Premji Foundation signed a Memorandum of Understanding to partner with the District Collector, West Godavari in 2003 to leverage this potential asset.

A model was jointly evolved to leverage these centers to provide computer-assisted learning for children in the age group of 6 - 14 years. Children from the government elementary schools use child centered, animated, game based content developed by Azim Premji Foundation in local Telugu language to enhance their quality of learning.

The foundation provides educational content to these centers and trains the teachers of the school from which children use computer assisted learning and the representatives of the e Seva / RSDP centers to effectively integrate Computer based learning with the classroom activities.

The 46 e-seva centers in mandal head quarter and the 144 RSDP centers together provide 200 potential computer labs for school children to use.

E Seva / RSDP centers with a local primary school in the vicinity were identified for the program. The average student population in most of these schools is around 200. Children in batches of 20, accompanied by a trained teacher use these centers for computer assisted learning. Each child gets 30 minutes of computer time every time they visit the centre (sharing the computer with four other children). Every child visits the centre once in 10 days. Notwithstanding the limited operational time a student gets, the impact of this exposure has been high. Within a short span of time, this program gathered momentum.

The programme commenced in September 2003 in 60 centers with the title *Chiluka Palukulu*, containing curriculum for the beginners to learn Telugu language, with songs and games.

In October 2003, the program was extended to all the 144 e Seva centers reaching 29,100 children. Additional seven titles covering Mathematics and Science in the local language Telugu were added to the Telugu language content provided at the commencement of the program. In January 2004, another 11 titles were introduced taking the total number of titles to 19.

The e Seva / RSDP centers These centres which are run for profit generate their own revenue for sustenance through the various commercial services. For the educational service they provide to the school children, they are paid by the government a fee of Rs. 2 per child per month. Azim Premji Foundation which is a not for profit organization, provide the content and training meeting its own expenses as a part of its efforts to realize its vision of quality universal education that facilitates a just, equal and humane society.

### **The Evaluation: Making Assessment Fun**

While the enthusiasm and involvement of the children in the computer classes and attendance was reward in itself. District administration and Azim Premji Foundation had the challenge to see if computer based learning had an impact on learning levels.

The district administration and the Foundation designed a unique online test for children in class I to V. The test was conducted between March 29<sup>th</sup> and April 5<sup>th</sup>, 2004. To add a thrill, the district administration announced prizes for the outstanding performance. The features of the test developed for the 29,100 students attending computer based learning were:

- Online tests, with the children answering the questions on computer.
- In view of the large number of children, each child individually was provided with 6 minutes of computer time to answer the questions
- Children in class I, II, III, IV and V were competed in five different groups
- The questions were on competencies in Maths, Telugu language, English and Science, based on content covered in the seven titles used in computer based learning classes since October 2003. The online test papers designed by District Academic Monitoring Officer, Dr. D. Prabhakara Krishnamurthy and his team of eight teachers.
- A bank of questions with multiple-choice answers was created with around 120 questions for each class.
- For every right answer one mark was awarded and for wrong answers no penal marks or negative marks was given
- At the end of six minutes, when the test ended, the marks for the child was displayed on the monitor and the marks be automatically stored in the computer
- There were totally ten sets of question papers from where the questions appeared randomly. The questions were designed at three levels -centre level, mandal Level and district level.
- The tests were done at three levels – Center level tests; the winners of center level tests in each of the five classes participated in Mandal level tests and the winner in Mandal level tests participated in the district level tests to ascertain the district level winner



Students taking the online tests

- National Informatics Center, Eluru developed a software program for the online tests. Visual basic was used as front-end tool and MS Access as a back end database. GIST SDK Tools were also used for language specific appearance on the screen.

Of the 29,100 children who appeared for the test at the centre level, 730 children (toppers in each class from each centre) qualified for in the Mandal level test. 230 winners at the mandal level qualified for the district level test, five from each Mandal, one for each class, of which 202 attended the district level test. The top 3 performers for each class were identified and these 15 children received prizes.

The District administration provided training to all the concerned personnel, District Resource Persons and Center Nirvahaks to ensure that this unique online testing was conducted without a hitch.

## The Results

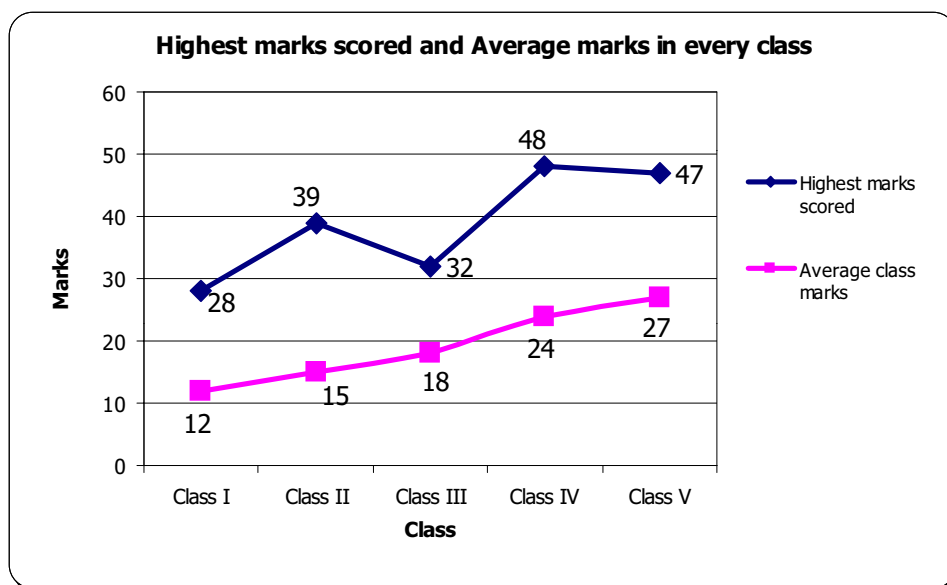
In the six minutes available to the children, this is what the winning children scored:

Class	I	II	III	IV*	V
<b>Winner</b>	28	39	32-50	48	47
<b>1<sup>st</sup> runners up</b>	22	31	32-38	42	44
<b>2<sup>nd</sup> runners up</b>	21	26	32-29	37-49	43

\* The marks in the column indicated the tied scores and the final score after the tie breaker.

In class III and class IV, more than one child performed at the award winning levels, necessitating tie breaks (a fourth round of test, to separate the tests). For e.g. in class IV there were two children with same score for the third place at 37, in the tiebreaker Miss. Rameeza Sultana scored 49 to get ahead. In Class IV, there were three children with scores of 32. In the tiebreaker, the scores were 50, 38, and 29 which decided their respective places in the top 3 positions.

While the winning scores provide some information on the level of performance and the intensity of competition, they reveal only part of the story. The impact of the full competition can be seen in the performance at the District level tests which is summarized below in the graph:



Some observations that can be drawn from the tests are:

All students in Class IV have scored above 5 marks and all students in class V have scored above 10 marks. A clear pattern is visible in the range of marks received by the children in higher classes. The highest marks scored and average class marks show a rising trend.

Some possible reasons that can account for this pattern in performance can be that, students in Class III, IV and V have learnt to use and control the mouse better. The other reason could be that as the questions were in written form, the speed of reading in senior classes was faster than in junior classes. Both these reasons have a bearing since the test had a time limit of six minutes.

	Class I	Class II	Class III	Class IV	Class V
<b>Highest marks scored</b>	<b>28</b>	<b>39</b>	<b>32</b>	<b>48</b>	<b>47</b>
<b>Average class marks</b>	<b>12</b>	<b>15</b>	<b>18</b>	<b>24</b>	<b>27</b>
<b># of students scoring 0-5</b>	2	2	3	0	0
<b># of students scoring 6-10</b>	7	5	7	4	0
<b># of students scoring 11-15</b>	11	16	10	6	5
<b># of students scoring 16-20</b>	2	12	10	6	12
<b># of students scoring 21-25</b>	2	3	7	5	3
<b># of students scoring 26-30</b>	1	1	4	11	10
<b># of students scoring 31-35</b>	0	1	7	6	7
<b># of students scoring 36-40</b>	0	1	0	2	5
<b># of students scoring 41-45</b>	0	0	0	1	3
<b># of students scoring 46-50</b>	0	0	0	1	1
<b>Total</b>	<b>25</b>	<b>41</b>	<b>48</b>	<b>42</b>	<b>46</b>

### The Rewards

The stage is set for the grand finale. Brindavan gardens in Eluru resplendent with colorful plants, bright children, eager teachers, and enthusiastic department staff are all set to facilitate the cyber children. Mr. Sanjay Jaju, the District Collector, West Godavari District, Andhra Pradesh, presided over the grand prize distribution function.

The 15 students from class I to class V adjourned the winners proudly received their awards. The prizes :

1<sup>st</sup> Place: Rs. 2,000 from the District Administration and Wrist watch from Azim Premji Foundation

2<sup>nd</sup> Place: Rs. 1,000 from the District Administration and Wrist watch from Azim Premji Foundation

3<sup>rd</sup> Place: Rs. 500 from the District Administration and a Parker pen from Azim Premji Foundation

### We caught up most of the winners and spoke to them.

**Himaja** was the topper from **class V**. She scored 44 in the final round. As she came out of the examination hall, she was a bit disappointed. She had scored 94 in the mandal level test (the tests were stiffer at the district level from the mandal level / center level). She kept asking her father if she would win. "I want to become collector," says Himaja. When I asked why, she says, the collector will have money with which she can help the poor people by giving money to them. Asked what she will do with her prize money "I am putting the money I won in the competition in the bank for an emergency," she says.

**Pavan** a class III student from MPUP School, Attili wants to become a police inspector. He says there have been many theft cases in his village. He wants to prevent the theft cases. "I spend my time after school playing," he says. "My father Pothuraju is a daily wage worker. My mother Anjamma does cooking at home," he quips. When asked what he will do with the money he has won, Pavan says he will give it to his father.



Srisha

**Srisha** in class I is the dazzling eyed girl dressed in shirt and shorts. If her father had not mentioned we would have thought she was a boy. She wants to become an eye doctor to help the poor people who are blind. Her father, Babu wants her to be dressed like a boy. She doesn't know what she will do with Rs. 500 that she has won in the competition. Her parents Kumari and Babu go for daily wages.

**Ajay Tejasvi** from class IV had not expected that he would win in this competition. He is very happy that he has won a prize. He wants to become a computer engineer.

**Suma** also from class I secured the first place. She wants to become a doctor. The prize money she got will be kept in the bank for further use she says. **Varaprasad**, class I student is the second prizewinner. He too wants to be a doctor.

**Anuchanda** of Class II says, "I knew I would get the prize. I had prepared well for the exam." She wants to become a teacher. **Manikanta** of class V wants to become a computer engineer. **Lavanya** of class III wants to become a teacher. With the prize money, she wants to purchase some books which will be useful in her future. **Laxmipriya** of class IV wants to become a teacher and help the poor children.

### The players who made Assessment Fun for children

They chased a dream and made it come true. Today. Six months back, they had dreamt about students in the government school getting to learn and play with computers, it is a reality now. And they did it as a team.



Jubliant students with the dignitaries

**Mr. Sanjay Jaju:** the dynamic district collector of West Godavari, the crusader of the project. His earlier stint in education had made this planning easier. The assessment through online test was his brainchild. He is a very ardent cricket fan. His Sundays are spent in playing cricket along with his colleagues.

**Mr. Sathya Saibaba:** Director, National Informatics Centre, Eluru, the man who translates ideas into practice. In the initial stages, he was the project manager who made it possible. For the testing software, he was the inspiration. He likes to spend time with son Madhav and Aruna, his wife.

**Mr. Prasad Raju:** Assistant Project Officer, Sarva Shiksha Abhiyaan, is thrilled about the success of the program. He admits, "Initially we did not expect such a response from children or from the teachers. But today we realize the essence and the success of the programme."

**Dr. Krishnamurthy:** District Academic Monitoring Officer, is the person in charge of e-enabled initiative in West Godavari district. A very talented person, quiet and composed always, he is the recipient of best teacher award at the district and state level. The question papers for the online tests were prepared under his supervision and guidance. He is one of the key training resources for scaling up the model to other districts.

**Mr. Madhav:** District Information Officer, National Informatics Centre is the architect behind the software developed for the online tests. Madhav hailing from Vijayawada is very happy that the whole program went smoothly. He likes to do creative work such as webpage design. His ambition in life is to direct a movie. He already has a story line ready and is hunting for "producers". Let's wish him luck.

**Ms. Prema Narasimhan,** Program Coordinator, Azim Premji Foundation, the popular saying that every success has a lady behind it is proved by her presence for this program. She has spent more weekends in West Godavari than at her home in Bangalore, not counting the week days when her desk in Bangalore was vacant. "9 out of the 15 winners are girls" she beamed with pride after the awards were announced.

**Mr. Jagdish,** Project Coordinator, Azim Premji Foundation, was the one man call center in West Godavari who provided the support to the centers to get them up and running.

### Impact of Computer Aided Learning Program on Learning levels

Simultaneously, in the month of March 2004, a study was conducted to ascertain the impact of Computer assisted learning on the learning levels of children.

The study was designed in the form of a written competency test for:

- Children in class 3, 4 and 5 (age group 8, 9, 10).
- 25 questions from three titles relevant for the class that converged with the curriculum used in the state were prepared.
- 961 children from 10 randomly selected schools were identified as the experimental group from centers that had been operational since September 2003 (ie for about 6 months till the date of the test).

*(Experimental group comprises schools that use the traditional class room methods of teaching reinforced by computer assisted learning with assistance by the teachers.)*

- 811 children in 10 other schools in the proximity of the randomly selected experimental schools were selected as the control group.

*(Control group comprises schools that use only the traditional class room methods of teaching.)*

A total of 1,772 students were tested across these 20 schools. The average marks obtained by the students (out of a maximum of 50) are summarized below.

	Experimental Group Schools		Control Group Schools		Significance
	No of students	Avg. marks (out of 50)	No of students	Avg. marks (out of 50)	
<b>Class 3</b>	251	31.41	250	25.74	Sig. at 95%
<b>Class 4</b>	320	31.52	277	28.36	Sig. at 95%
<b>Class 5</b>	390	28.77	284	24.41	Sig. at 95%

An analysis of variance test (ANOVA) was performed to determine if the marks obtained by the children in the two groups of schools were *different*. The test indicates that performance of the children in the experimental group schools is *significantly better* than the performance of the children in the control group schools. This study seems to point towards the conclusion that the

experiment of providing computer aided learning to the children with the involvement and participation of the teachers has been successful.

To be able to replicate similar model in other parts, it would be necessary to document the involvement of the teachers in the experiment. A clearer assessment in terms of parameters like the time spent by teachers on the curricular content, the type of linkages that they drew between the class room teaching and the computer exposure, the type of follow-up exercises if any that they exposed the students to, the sequencing of the class room teaching and the computer exposure that was practiced and the quality of the class room processes in general would be helpful in further improving the computer assisted learning process.

	Class 3		Class 4		Class 5	
	Exptl. grp	Cntrl. grp	Exptl. grp	Cntrl. grp	Exptl. grp	Cntrl. grp
Sample sizes	251	250	320	277	390	284
Sample means	31.2214	25.5418	31.4655	28.2509	28.6551	24.3187
Sample std dev	10.6196	12.4905	10.54	12.10	10.6611	10.6211
Std error	0.67030	0.78997	0.59100	0.72666	0.53985	0.63024
Mean square between groups	4040.216		1534.264		3090.260	
Mean square within groups	134.352		127.772		113.301	
F	30.072		12.008		27.275	
Sig.	0.0000		0.001		0.000	