

**Report on the
High School Science Teachers Training Program
released on the occasion of the visit of
Former President Dr A.P.J. Abdul Kalam
to the Indian Institute of Science,
Kudapura Campus
on 8th November 2011**



**Talent Development Centre
Indian Institute of Science, Kudapura
Challakere, Chitradurga District, Karnataka – 577536**



Foreword

The Indian Institute of Science has acquired a second campus at Kudapura, Challakere in Chitradurga District of Karnataka. The creation of the second campus of the Institute has been greatly facilitated by the help rendered by the Government of Karnataka. IISc has always been very active in outreach programmes intended to spread the teaching of science. For many years, extremely committed faculty members have been involved in regular training programmes for high school teachers of Karnataka. The very first activity initiated at the new IISc campus in Chitradurga is the creation of a Talent Development Centre, which will enable the regular conduct of workshops and training programmes for school and college teachers. The very first programme has been conducted immediately after the inauguration of the temporary centre by the Chief Minister. The renovation of the abandoned buildings at the Kudapura site and the creation of facilities for demonstrating experiments have been accomplished in a remarkably short time by a dedicated group of faculty and staff, with very great help being rendered by the Deputy Commissioner and the district administration of Chitradurga. This preliminary report provides a background to the Talent Development Centre, and the very first programme conducted at the new campus of IISc. There is no doubt that future programmes will have significantly greater facilities available for participants, providing them with opportunity to interact with researchers and teachers from across the country.

P. Balaram

P. BALARAM
DIRECTOR

Preface

The place had a festive look when VIPs and a large number of people gathered on 26th February 2011 for the formal inauguration of the Talent Development Centre about fifteen kilometers from Kudapura-Challakere by Sri Yeddyurappa, Honb'le Chief Minister of Karnataka. Soon after the inauguration, the dignitaries left and the crowd dispersed, but a small group of people got down to the real task of starting the training programme for the first batch of one hundred high school science teachers belonging to Chitradurga district. An academic activity at the second campus had begun.

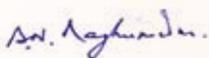
It is very difficult to describe the transformation that has taken place at what is now called the Talent Development Centre adjoining the second campus of Indian Institute of Science at Kudapura-Challakere, Chitradurga. Just about four months ago it was a scene of deserted and dilapidated buildings and degraded infrastructure. A hesitant suggestion about what could be done in that place and a few supportive and consenting voices - and, we had mentally adopted the place not grasping the full implications of what laid ahead. Today there are fully renovated and furnished residential buildings that can accommodate nearly one hundred and twenty guests, a very modern training Centre with multiple class rooms equipped with sophisticated teaching aids and a large dining facility with associated kitchen, stores and cleaning areas. Water, power and internet connections are in place and there is a small team of contract employees manning the complex TDC. More importantly the teachers have gone through an intense training programme for ten days at a remote place that not many among them had heard of. The full effort that has gone in to effect this transformation will perhaps remain unrecorded.

Once we decided to establish the Talent Development Centre and Honorable Chief Minister agreed to inaugurate the Centre on 26th February 2011, we had four fold responsibility immediately before us - the refurbishing of the structures and other infrastructural support, planning the training programme, dealing with the needs of the inaugural function and interacting with the several department of the State government and those within our Institute. Each one of them was quite demanding especially in view of the short time available. Thanks to some of our colleagues and well wishers who shared the responsibilities, the actual execution did not cause any undue anxiety. One person who envisioned the growth of this region and took the all the initiatives and mobilized the resources at the district for making this happen was Mr Amalan Biswas, then DC of Chitradurga.

Prof Venkatarama Reddy who combines the technical expertise in construction Engineering with a sense of social commitment shouldered the full responsibility of planning and supervising the renovation activities. He was very ably supported by the architect, Ms Mala, the engineers and staff of Nirmiti Kendra who in the last few days leading to inauguration must have worked for more than fifteen hours a day. Prof Mohan Kumar and his team at the Karnataka State Council for Science and Technology volunteered to take charge of the inaugural function and did a meticulous job. Prof M.S.Hegde as a veteran in Teachers Training Programme had to do far more than the planning of the training programme because the success of the programme hinged on readiness of the training centre and good will of a large number of instructors. Mr Jagadeesh, Special Officer for this activity had to use all his administrative and public relations skills to see that everyone, from the high officers of the state administration to the unskilled labor at the work spot responded quickly to our needs. Prof Anurag Kumar and his dedicated team ensured that the internet connections were in place in time. Mr Janardhana Swamy, MP from Chitradurga and a proud alumnus of our Institute lent his support whenever required.

At the back of all these flurry of activities was Prof Balaram, our Director who took interest to see that the Institute made its presence at Kudapura-Challakere at the earliest. I must also record the help received from various quarters of the Institute, Prof N. Balakrishnan, Associate Director and the administrative staff led by the Registrar and the Financial Controller.

On the whole, it was a memorable experience for me.



B. N. Raghunandan

Chairman

Acknowledgement

Sunday, 27 December 2009. Professor Umarji was conducting High School Teachers Training to over 150 teachers in MRC auditorium for Doddaballapura and Bangalore Rural district teachers. I had given my lecture between 9 -30 to 10-30 AM. Umarji had invited Professor Balaram, Director to meet the teachers. Professor Balaram entered the hall at about 11 AM. The teachers stood up and would not sit till he persuaded them. Summarizing the program, Umarji requested the Director to speak. He stood up but he was engrossed with thoughts. After a few minutes of silence he said: 'Training the teachers is a good idea but we do not have a permanent place for this in IISc. There is no laboratory for such a program'. Again he stood there without speaking. He wished good to the teachers and left the hall. I walked with him towards his lab. He stopped by at the usual corner below his laboratory. We talked about teachers training program that has been going on and the possibility of creating an ideal centre for such a program in the new campus at Kudapura –Challakere. Thanks to him for conceiving the idea and providing all support to establish and run a Talent Development Centre at IISc, Kudapura.

Teaching and experimental program in the TDC for the school teachers has undergone several changes based on the feedback received from the trainees after conducting six programs. This is an in-house program for 10 days. There are two lectures between 8 to 11 AM and the rest of the day the teacher trainees spend time doing experiments. Laboratories are equipped with a large number of experiments in physics, chemistry and biology related to respective subjects up to 8, 9, 10 11 and 12 classes. It has been an extremely difficult task to set up TDC. Getting materials, equipments, chemicals, water, electricity-UPS, and many such facilities to this remote place was an experience by itself. Speed post needs to be collected from Nayakana Hatti- 7 KM away. Most of the materials ordered have to be collected from Challakere. Or load in the Qualis from IISc Bangalore and drive. No cup of tea is available within a radius of 7 KM for those who deliver any material. Facilities have been created where 120 trainees and 10 faculty members can live. In-house training can be conducted for 10 days with reasonable comfort. A large number of people have worked and thanks to all of them.

Professor R Vittal Rao, Professor H. L. Bhat and Professor Shishpala have developed Maths, Physics and Biology programs respectively. Professor Abdul Khadar and I have developed Chemistry Program. Professor Anurag Kumar organized Internet facility. We thank all of them.

A large number of faculty members have come and given lectures, helped conduct experiments, corrected assignments, conducted tests and tutored. I am extremely grateful to all of them.

Unconditional support by Associate Director, Professor Raghunandan and his committee, Registrar, FC and people in the accounts office, special officer, has made it possible to run one to two training program in a month. I thank all of them. Support from Profs. Umarji and Mohan Kumar (members, TDC) is gratefully acknowledged. The contract employees who have been cutting vegetables and serving food have now been trained as laboratory assistants. Thanks for their unconditional support to run the place.

The Chief Secretary, Secretaries of DST and Education Depts, Karnataka Govt., DPI and DDPIs of Karnataka have provided full support and have been sending the high school teachers for training. We thank all of them. The teachers become students for those ten days. We serve these teachers to acquire knowledge to become excellent educators.

M. S. Hegde

M. S. Hegde

Convener, Talent Development Centre

Talent Development Centre

Indian Institute of Science

Kudapura - Challakere, Chitradurga Dist.
KARNATAKA – 577536

Background

The Indian Institute of Science - Bangalore has been conducting **High School Science Teachers Training Programs** in one District of Karnataka in a year for the last 35 years. Over 100 teachers in each district from Govt. / Govt. aided schools have been given intensive teaching/training in Science for 10 days every year. Although conceptually laudable, this was too small an effort to make an impact on the teaching in High Schools. There was no permanent place in the Institute for this program. With enough land available to IISc at its new campus at Kudapura, Chellakere, Chitradurga (577536), the Institute conceived the idea of starting a **Talent Development Centre (TDC)** on its second campus. The High School Science Teachers Training Program is the first academic program initiated at **TDC** by the **Institute**.

Talent Development Centre

The Institute conceived the idea of starting a **Talent Development Centre** to impart training to science teachers at high school, 10+2, degree college and University teachers and to conduct discussion meetings, seminars, winter and summer schools. The centre is to provide academic and research facilities for the high school, college, and University levels. The High School Science Teachers Training Program is considered a priority because it is in high schools that students are introduced to science. Science education is crucial for the development of our nation. It is the experience of the Institute that if the teachers are well trained, a vast number of students are benefitted for a long period of time. Therefore at IISc at Kudapura campus, high school science teachers training program has been developed at the Talent Development Centre.

Excitement in Science

Interest in Science and Engineering is experienced by doing experiments. Teachers can arouse interest only when the teachers are excited by doing experiments. Therefore a training program emphasizes experiments for the participants instead of lectures on black a board or Power Point presentation. **Such experimental training at present is singularly lacking in any of the training programs for high school teachers.** It is obvious that the teachers should have correct knowledge to impart it to the students. This would be a reality only when teachers have the opportunity to

correct themselves, learn and gain confidence through discussions with those who practice science.

To motivate students to learn, teachers should be motivated first. Upgrading the level of knowledge of the teachers from time to time will automatically raise the level of learning by the students. The unanimous opinion of the IISc faculty who participated in the high school teachers program is that the teachers training program greatly helps the teachers to enhance their knowledge and ability to teach and induce the students to take up a career in science.

Why do High School (higher Secondary School) Teachers need training?

- a. It is in high school that the students are introduced to science.
- b. Encouraging the students to take up basic science helps for progress of our nation.
- c. High schools teachers are the catalysts for the students to pursue science studies.
- d. Teachers themselves need motivation to teach science.
- e. Teachers should be sure of the basic concepts in physics, chemistry, mathematics, biology.
- f. Teachers knowledge need to be upgraded to cope up with the advancement of science.
- g. Teachers need to have experience to conduct simple experiments in their schools.
- h. Teachers should be capable to absorb forward looking education policies of the Government.
- i. Overall discipline and honesty of purpose should be ingrained in the teachers.
- j. Teachers should be exposed to scientists from Institutions of higher learning.
- k. That teaching requires continuous learning is to be ingrained in teachers' mind.
- l. Teaching science through experiments must be introduced to the students.
- m. Teachers must have knowledge that science leads to technology.
- n. Spirit of enquiry is essential to make progress and the teachers should imbibe this.
- o. Habit of reading science articles and books needs to be inculcated in the teachers.

- p. Teachers should be innovative to use local materials to conduct experiments.
- q. Teachers should sense that there are plenty of resources around them to teach science.

Therefore if the high school science teachers are motivated and trained, it is bound to have a long term positive effect on science education.

Science teaching in High Schools

Teaching science in the class room just on the black board is too boring. Science is largely an experimental subject. While some of the older high schools have science laboratory in their schools, teaching science through experiments is largely missing in most schools. Even where the laboratory is available, they are not upgraded. Ability to conduct experiments and demonstrate the concepts of science has to be enhanced among the teachers to cope with the advancement in science. Formal experimental program for science students start at the +2 levels. This needs to be introduced at 8, 9, 10 classes so that more students take up science at the +2 level.

Even though large sums of money are spent on school education by the Central and State Governments, method of imparting quality education to all is still a distant dream. A well thought out program to enhance scientific knowledge is lacking. Experimental approach to study science is singularly lacking in our curriculum. One way to impart quality science education to school children is to educate the teachers. Therefore the Talent Development Centre, IISc at Kudapura has designed a 10 days in-house training program for high school science teachers with an emphasis on learning science through experiments.

Unique features of the high school science teachers training at TDC

It is an in-house/residential program for 10 days. High school teachers (Trainees) and Professors from IISc and various Universities (Teachers) stay in the new campus for 10 days to facilitate academic interaction. TDC is in an isolated place and there is no distraction for the trainees during the 10 days of training. Trainees are made to work at least 10 hours a day.

- a. In order that high school teachers become proficient to teach science up to class 10, physics, chemistry, maths and biology are taught up to the 10 + 2 level.
- b. 10 lectures of 1 h duration in each subject are considered sufficient to introduce basic concepts in the syllabus up to the 10+2 level and hence more time is devoted to experiments.
- c. Seven hours of practicals each day would cover complete science subjects they teach in high schools.

- d. Physics and Maths teachers (with BSc degree with PCM subjects) are grouped together and they will have intensive training for four days in each subject. Indirectly, chemistry is introduced to them by teaching solid state. Chemistry is also taught as and when the trainees ask.
- e. Those who teach Maths only will have additional training in Maths.
- f. The PCM group will write three to four assignments in Physics and 4 to 6 assignments in Maths.
- g. Work load distribution in the high schools show that science teacher (generally BSc with BZC qualification) has to teach Physics, chemistry and biology. He has not studied Physics beyond the +2 level in his/her career. They are also too poor in arithmetics and simple maths which they need to study physics and chemistry. Therefore teachers with BZC qualification go through a separate program namely, two days of biology, one day of maths, four days of physics and three days of chemistry.
- h. The BZC group has therefore to work harder during the program. Therefore the BZC group carries out experiments in Biology, Physics and Chemistry.
- i. Laboratory experiments are of two types: (a) experiments in the syllabus for them to try in their schools and (b) experiments to illustrate scientific principles.
- j. More than 20 experiments in chemistry, 20 experiments in Physics and 20 experiments in biology have been designed and the trainees complete all of them.
- k. The teachers do these experiments and enter their observations in their laboratory manual.
- l. Most teachers do not relate the laboratory experiments (principles behind the experiment) to the science they teach because of the way they are taught in their BSc degree classes. A special session is held by an experienced professor to show how the experiments are helping them to explain the science they teach in the classes.
- m. List of experiments in each subject is compiled based on the subjects they teach in 8, 9, 10 classes taking into consideration all the text books (Karnataka State High Schools, ICSC, CBSC and others prevalent in India).
- n. Suggestions from the trainees have been incorporated to the list of experiments. Assignments are given in each subject and books are provided to them to solve the assignments. Answers to the each of the assignments have to be submitted by the participants and they are corrected and given back in time. Problem/assignment solving session is arranged so that the mistakes they committed are corrected.
- o. Astronomical observations in the evenings with telescopes are arranged: this is

possible since they all stay in the campus for 10 days. This will also cover their syllabus on the subject.

- p. Introducing creative teaching by way of taking up simple projects during the training period to enhance thinking process such as model building is attempted.
- q. Tests and question answer sessions are held to assess the effectiveness of the training.
- r. Written feedback is solicited from the trainees to continuously fine tune the program.

Special Lectures

On three to four evenings, special lectures are arranged on topical subjects between 7 to 8 PM. The topics include:

Water; Air pollution; Lasers and applications; Nuclear Energy; Waves and Earthquakes; Genetically Modified crops; Our Universe; Conservation of Energy; Electron Microscopy; Nano-materials; C_{60} ; Graphene, Quasi Crystals and so on.

Language

The medium of instruction in Govt. and Govt. aided high schools in 8, 9, and 10 grades in Karnataka is Kannada. About 85 % of children in Karnataka study in these schools. The medium of instruction in BSc classes is in English. Therefore the teachers understand English and many speak English fluently. Further, they are well versed to translate an English term into Kannada. Most of the technical words (terms) in English are written as such in Kannada. Since TDC IISc is an all India Institution, the program caters to the needs of teachers from all parts of India. The Professors in IISc are also from all over India. Since science can be taught in simple English, there has been no real problem in training the teachers in English.

In today's World, science communication is in English. Scientific journals where discoveries are published, are mostly in the English language. Scientific journals in Russian, French, German, Japanese and such other languages are all vanishing because there are few readers. If an Indian is to be known as a scientist, he needs to publish his research findings in English so that people across the world can read them. If our children have to become recognized scientists and engineers, they have to learn science in English language. Most information from Internet is available in English. Therefore we have adopted English as the medium of instruction in the training program in the interest of students of Karnataka. This does not mean that local language is not used. Science knowledge is imparted in a way that the teachers understand the subject. That is the spirit.

Sports

Volley ball, cricket, through ball, foot ball courts; a track for jogging, carom and chess. The surrounding is clean and air is fresh and unpolluted for jogging and walking in the morning and evening.

Vision of High School Teachers Training

The prime vision of this program is teaching and training the teachers to teach students with passion. Motivation to higher level of intellectual pursuit is more important than just giving lectures covering "syllabus". The hall mark of IISc academic program is in its rigor, honesty of purpose, simplicity, humility, sincerity, time consciousness, hard work and delivery. Research and the research attitude drive the Institute. If a lecture, a meeting, an examination, or an interview is announced in IISc, it takes place at the appointed time. Can we inculcate in these teachers the Indian Institute of Science culture of learning? Once the teachers have imbibed IISc academic culture, would it not reach the high school students?

Physics Experiments

1. Temperature Coefficient of Resistance.
2. Equilibrium of concurrent coplanar forces.
3. Characterizing Iron Constantan Thermocouple.
4. Verification of Conservation of Energy.
5. Resonance Column.(Velocity of sound using tuning fork).
6. Sonometer (using electromagnet).
7. Frequency of Electric Vibrator.
8. Viscosity of liquid.
9. Surface Tension by capillary Rise Method (using travelling microscope).
10. Young's Modulus by Searle's Method.
11. Young's Modulus using Cantilever (using travelling microscope).
12. Hooke's law.
13. Spring Constant.
14. Moment Bar (Verification of conditions of equilibrium of parallel forces).
15. Specific heat of liquid using Newton's law of Cooling.
16. Verification of Boyle's Law.
17. Verification of Ohm's law.
18. Diode/Zener Characteristics.
19. Transistor - input and output Characteristics.
20. Half & Full wave Diode Rectifier circuits.

21. Common Emitter Transistor Amplifier and its frequency response.
22. Refractive Index of prism - pin method.
23. Lateral shift using a glass slab – pin method.
24. Refractive Index of Liquid using Travelling microscope (Shift Method).
25. Spectrometer – Refractive Index of prism/liquid (H_2O).
26. Verification of Photoelectric Effect.
27. Mercury spectra using spectrometer.
28. Sodium spectra using spectrometer.
29. Hydrogen spectra - Wavelength of lines in Balmer series.
30. Wavelength of laser source using diffraction grating.
31. Focal length of convex lens (U-V method).
32. Comparing M_1 and M_2 using Deflection Magnetometer.
33. B_H using Tangent Galvanometer.
34. Mapping of Magnetic lines of force of a bar magnet using magnetic compass and pencil.
35. Screw Gauge.
36. Vernier Caliper.
37. Simple Pendulum – 'g' and length of seconds pendulum.
38. Meter Bridge – Resistivity of unknown wire.
39. Specific heat of Water-Joule's Calorimeter.
40. Internal Resistance of the battery.
41. Current Sensitivity of a pointer Galvanometer.
42. Conversion of Galvanometer into Voltmeter.
43. Self-Inductance of a coil through Impedance measurements and to plot the Phasor diagram.
44. Charging and Discharging of a capacitor.
45. Logic Gate – Universal gate concept.
46. Light Dependent Resistor experiment.
47. Operational Amplifier experiments (Inverting and Non Inverting).
48. Amplitude Modulation (DEMO).
49. Frequency Modulation (DEMO).
50. Density of Solids and Liquids.

Chemistry Experiments

1. Estimation of HCl from standard Na_2CO_3 .
2. Estimation of alkali from standard acids.
3. Weak acid/strong acids vs weak base/strong base titrations.
4. Redox titration: KmnO_4 /Oxalic acid
5. Redox titration: KMnO_4 / Fe^{2+} ion.
6. Redox titration: $\text{K}_2\text{Cr}_2\text{O}_7$ vs Fe^{2+} ion with diphenylamine indicator.
7. Density measurements: Solids and liquids.
8. Electrolysis of water.
9. Tyndall effect.
10. Conductivity of electrolytes and non electrolytes.
11. pH measurements and buffers.
12. Measurement of Temperature
13. Boiling point, melting point.
14. Thermo-couples and flame temperature.

Preparation of gases and their properties:

15. CO_2
16. Cl_2
17. NO
18. NO_2
19. H_2
20. O_2
21. Chemical Reactions: Reaction of metals with acids (HCl , H_2SO_4).
22. Reaction of metals with alkali.
23. Reaction of metals with HNO_3 .
24. Displacement Reactions.
25. Precipitation reactions.
26. Coordination chemistry: reactions with transition metal ions and ligands.
27. Colors and transition metal ions.
28. Solubility product determination from concentration cell.

29. Lambert-Beer law and molar extinction coefficient employing a spectrometer.
30. Charge transfer spectrum and charge transfer transition.
31. Iodimetric titrations.
32. Estimation of oxygen in CuO_{1+x}
33. Estimation of oxygen in MnO_{2-x}
34. Conductometric titrations and mobility of ions.
35. Potentiometric titrations.
36. Spectroscopy- Hydrogen spectrum: Balmer lines
37. Emission spectra of Na and Hg vapour lamps.
38. Flame color and flame tests for atoms and ions.
39. Photoelectric effect.
40. Resistivity of metals and semiconductors as a function of temperature.
41. Crystallization and re-crystallization, purification of salt.
42. Crystallization with impurities: Fe ion in KCl/NaCl
43. Crystal shapes – observation from optical microscopy.
44. Total dissolved salts (TDS) in water- test for potability.
45. Indexing of X-ray diffraction lines.

Biology experiments

1. Safety measures in microbiology laboratory
2. Study of Microbiological tools
3. Study of compound microscope
4. Microbiological sterilization methods
5. Preparation of culture media
6. Isolation of microorganisms from natural sources
7. Culturing of bacteria in liquid and solid media
8. Study of cultural characteristics of bacteria
9. Bacterial catalase test
10. KOH solubility test for bacteria
11. Preparation of bacterial smears

12. Simple staining
13. Gram's staining
14. Negative staining
15. Bacterial motility- Hanging drop technique
16. Isolation of seed borne fungi by blotter method
17. Microscopic observations of fungi by tease mount preparation
18. Examination of pond water
19. Study of Cyanobacteria/Algae
20. Study of Fungi
21. Study of Lichens
22. Study of Protozoa
23. Effectiveness of hand scrubbing on microbial load
24. Blood group determination
25. Ammonification in soil
26. Rapid quality testing of milk
 - a) Organoleptic tests
 - b) Clot on boiling test
 - c) Alcohol test
 - d) Turbidity test
27. Antibiotic susceptibility testing
28. Study of plant diseases
29. Glucose test
30. Diffusion
31. Photosynthesis
32. Test for Starch

Teachers who teach the trainees

Maths

1. Professor N Vittal Rao
2. Professor C R Pranesachar
3. Professor Venkatachala
4. Professor Renuka Ravindran
5. Professor C S Yogananda
6. Professor Sathyakrishna
7. Dr. Shailaja Raghuprasad
8. Sri H N Mahendra Raje Urs
9. Dr. Harish Seshadri

Chemistry

1. Professor M. S. Hedge
2. Professor A M A Khadar
3. Professor S Vasudevan
4. Professor Arun Umarji
5. Professor E Arunan
6. Professor S Sampath
7. Professor K.L. Sebastain
8. Professor T.N. Guru Row
9. Professor A G Samuelson
10. Dr. C Shivakumara
11. Dr. A Srinivasan
12. Dr. N Mahadev
13. Dr. Jayamani
14. Professor. S Ramashesha
15. Professor Kalluraya
16. Dr. A. S. Prakash

17. Saptarshi Chatterji
18. Raj Kumar Roy
19. Nandhini Srirama
20. Bhaskar Mukri
21. Miss Akankasha
22. Ahin Roy
23. Banveer Pal

Physics

1. Professor H. L. Bhat
2. Professor M. S. Hegde
3. Professor B K Raghu Prasad
4. Professor S Ram Kumar
5. Professor G. Jagadeesh
6. Dr. P Nagaraju
7. Sri. G S Ramesh
8. Dr. V. Jayaram
9. Dr. Vishnu Prasad Botla
10. Dr. B S Shylaja
11. Dr. K P Ramesh
12. Dr. M K Raghavendra
13. Dr. Gopal Hegde
14. Dr. K. Jugeshwar Singh
15. Miss. K.R.S. Preethi Meher
16. Sri. H R Madhusudhan
17. Mr. S Sunil Kumar
18. Mr. Praveen S Bharadwaj
19. Dr. R S Geetha
20. Dr. P. Nagaraju
21. Professor B. N. Chandrika

Biology

1. Professor S. Shishupala
2. Professor Seetarama
3. Professor K Shankar Rao
4. Professor Shiva Kumar Swamy
5. Dr. Harish Bhat
6. Dr. Uday Allam
7. Dr. Veena Anil
8. Dr. N S Leela
9. Miss P N Savitha
10. Mr. Darshan S Tuppad

Computer

1. J. Gajanana
2. J. Amith
3. Pradeep
4. Rohit Vallam

Special Lectures

1. Professor M Sudhakar Rao
2. Professor CV Vishveshwara
3. Professor Saraswathi V
4. Professor N Ravi Shankar
5. Professor S Shantharam
6. Professor B. N. raghunandan
7. Professor B. V. Venkatram Reddy
8. Professor Mohan Kumar
9. Professor P Balaram
10. Professor M S Hegde
11. Professor H. L. Bhat

12. Professor P K Ghosh
13. Professor A K Shukla
14. Professor J M Tarsacon
15. Professor B K Raghuprasad

Teachers trained from Feb. 2011 to Oct. 17 2011

So far we have conducted five training program for Chtradurga and Bellari district teachers who teach 8, 9 and 10 classes and one program for 82 Navodaya PG teachers from all over India.

Chitradurga District	285
Bellary District	185
Navodaya PG teachers	82



Discussion with Honorable MP, Janardhan Swamy and Amlan Biswas, DC, Chitradurga to fix the date of first training program at IISc, Kudapura-Challakere



Talent Development Centre, before renovation



Talent Development Centre, after renovation



Interior of the training Centre before renovation



Interior of the Centre after renovation

Facilities at TDC



Accommodation for 110 participants.



Accommodation for 10 faculty members at any given time.



A Dining – hall with a seating capacity of 150.



A Multi Media Class Room (MMCR) at the TDC with 100 seats.



A class room with projection facilities with 60 seats.



A class room at Guest House No.1 for 30 people. This is also a conference room



A chemistry laboratory for 60 students.



A physics laboratory for 60 students.



A biology laboratory for 60 students.

Two telescopes to look at the sky.



A class room with laptop computers and WiFi connection.

A Computer laboratory with 20 computers and an internet connection.



Beaming lectures from IISc Bangalore Campus to IISc Kudapura Campus and vice a versa.

