सत्यमेव जयते
Government of India
Ministry of Human Resource Development

Guru Angad Dev
Teaching Learning Centre of MHRD
SGTB Khalsa College, Delhi University

A Centre of MHRD, Govt. of India
under Pandit Madan Mohan Malaviya National Mission
on Teachers and Teaching (PMMMNMTT)

In collaboration with

Christ College (Autonomous), Irinjalakuda

Thrissur, Kerala, India- 680125

November 2020

Quality Science Education in India in the 21st Century

One Week Online Faculty Development Programme
(03-11-2020 - 09-11-2020)

Overview

To enhance the quality of the teaching learning process, we are planning to organize a 7-day faculty development program (FDP-2020) for science teachers, which may be used by the participants for the Career Advancement Scheme. The targeted training group comprises college teachers in various Science streams. It may be also useful for interested Higher Secondary Teachers. The proposed faculty training will be conducted by celebrated teachers, many of them are fellows in various national science academies (INSA, IASc and NASI) and scientists of reputed organizations. The program will have seven days of total sessions that will last from 3:00 pm to 6:00 pm between 03-11-2020 and 09-11-2020. Training sessions will be comprised of few practical session and lectures that will touch upon the topics from different science disciplines and general aspects of improving quality of science education in India in the light of National Educational Policy.

Date(s):	**03-11-2020 to 09-11-2020**
Duration: Seven Days:	**3:00 pm to 6:00 pm**
Title:	**National Faculty Development Program on Quality Science Education in India in the 21st Century**
No. of Registrations:	**191**
No. of Participants joined:	**184**
No. of Participants Qualified (50 or above Total Marks out of 100):	**181**
No. of Participants Not Qualified (49 or less total marks out 100):	**3**

Organising Committee @ GAD-TLC

CORE TEAM

- Prof A. K. Bakhshi, Chairman, GAD-TLC and VC, PDM University, Haryana,
- Prof K V Bhanumurthy Vice-Chairman, GAD-TLC
- Dr. Jaswinder Singh, Principal SGTB Khalsa College & Director, GAD-TLC
- Dr. Vimal Rarh, Project head and Joint Director, GAD-TLC

National Coordinator- Dr Vimal Rarh

Organising Committee @ Collaborating Institution

Convenor: Dr. Linto Alappat, Asst. Prof and Head, Dept. of Geology and Env. Science and Co-ordinator, Christ College Teaching Learning Centre.

Programme co-ordinators:

- Dr. K. Y. Shaju (Vice Principal)
- Dr. C.O. Joshi (Vice Principal)
- Fr. Joy P.T. (Vice Principal)
- Dr. Fr. Vincent N.S., CMI (Bursar)

Organizing Committee:

- Dr. Xavier Joseph
- Dr. Titto Varughese
- Dr. Subin K Jose
- Dr. Manju N.J.
- Dr. Bijoy C.J.
- Ms. Merin Jose
- Dr. Nandini C.V.
- Mr. Jose Sunny
- Dr. Devi K.

LMS Team

- Ms. Vandana T V
- Ms. Minu Mary P J
- Mr. Linto George

Technical Support (IT)

- Mr. Abhijith S Menon
- Mr. Prajeesh Menon
- Mr. Hariharan

Advisory Committee

- Dr. Tessy Paul P. (Dean of Science, Christ College Autonomous)
- Dr. B.P. Aravinda (Dean of Languages, Commerce and Humanities)
- Dr. Davis Antony Mundassery (Controller of Examinations, Christ College Autonomous)

Resource Persons and Panelists:

1. Prof. A.K. Singhvi, Vice President, Indian National Science Academy, New Delhi

   Email: 2aksprl11@gmail.com
   Phone: 9099061962
2. Prof. A.K. BAKHSHI, Vice Chancellor, PDM University, Haryana
   Phone: 8826676577
3. Dr. VIMAL RARH, Project Head and Joint DIrector, GAD TLC of MOE, GOI
   Phone: 9810094703

4. Prof. Kambadur Muralidhar PhD FNASc FASc FNA, Former Jawaharlal Nehru Chair, UoH, Former Sir JC Bose National Fellow, SAU, Former Head, Department of Zoology, DU
   Email: kambadur2015@gmail.com
   Phone: 9810927705

5. Prof. Amitava Das, FASc, FNASc, FRSC, Former Director CSMCRI and now Distinguished Prof in Chemistry, IISER.
   Email: amitava@iiserkol.ac.in
   Phone: 9428051283

6. Prof. S. LOKANATHAN, Emeritus Fellow, University of Rajasthan
   Email: lokanathansub@gmail.com
   Phone: 9980860090

7. Prof. L. Elango, Professor & Head, Department of Geology, Anna University, Chennai.
   Email: elango34@hotmail.com
   Phone: 9444118629

8. Dr. Kirpa Ram,Assistant Professor, Institute of Environment and Sustainable Development (IESD), Banaras Hindu University.
   Email: ram.iesd@bhu.ac.in
   Phone: 7607700787

9. Dr. Subrata Nandy, Scientist/Engineer - SE, Forestry and Ecology Department, Indian Institute of Remote Sensing ISRO, Govt. of India, Dehradun
   Email: nandy@iirs.gov.in
   Phone: 9897348675

10. Mr. Prasun Kumar Gupta, Scientist/Engineer - SD, Geoinformatics Department, Indian Institute of Remote Sensing ISRO, Govt. of India, Dehradun.
Email: prasun@iirs.gov.in
Phone: 9997582260

11. Mr. Vinay Kumar, Scientist/Engineer – SE, Photogrammetry and Remote Sensing Department Indian Institute of Remote Sensing ISRO, Govt. of India, Dehradun
Email: vinaykumar@iirs.gov.in
Phone: 9897800601

12. Vishal Joshi, Ph.D. Scientist, Astronomy & Astrophysics division, Physical Research Laboratory, Ahmedabad (India) - 380 052
Email: onlyvishal@gmail.com
Phone: 9426970014

13. Dr.V.P. Joseph, Former Dean of Science, Christ College Autonomous, Kerala.
Email: vpj@christcollegeijk.edu.in
Phone: 9447877760

Christ College (Autonomous)
Irinjalakuda, Kerala 680125
Affiliated to the University of Calicut and
Re-accredited by NAAC (Grade A)

"Guru Angad Dev Teaching Learning Centre" (GAD-TLC), MHRD, under the scheme of Pandit Madan Mohan Malviya National Mission on Teachers and Training (PMMMNMTT)

MHRD Govt. of India

National Faculty Development Programme on

QUALITY SCIENCE EDUCATION IN INDIA IN THE 21ST CENTURY

(Inter-disciplinary: applicable to all science teachers)

3rd- 9th November 2020
3 p.m. to 6 p.m.

Overview

To enhance the quality of the teaching learning process, we are planning to organize a 7-day faculty development programme (FDP-2020) for science teachers, which may be used by the participants for the Career Advancement Scheme. The target group comprises college teachers in various Science streams. Interested Higher Secondary teachers may also register. The proposed faculty training will be conducted by renowned teachers, many of whom are fellows in various national science academies (INSA, IASc and NASI) and scientists of reputed organizations. The seven days programme from 03-11-2020 to 09-11-2020 will have sessions from 3:00 p.m. to 6:00 p.m. Training will comprise practical sessions and lectures that will touch upon topics from different science disciplines and general aspects of improving quality of science education in India in light of National Educational Policy 2020.

Topics to be Discussed

1. **Achieving Excellence in Science in India in the 21st Century: Challenges and Opportunities**
2. **History and Philosophy of Natural Science**
3. **How to organize teaching of integrated Biology at UG level?-Implications of NEP-2020**
4. **Stimuli-responsive nano-aggregates and molecular assemblies**
5. **Overview of Remote Sensing and its applications**
6. **Geographic Information System (GIS) and its applications**
7. **Application of Geospatial Technology in Forestry and Ecology**
8. **Air pollution and climate change**
9. **Ground water quality assessment and monitoring techniques**
10. **Practical training on the usage of QGIS software**
11. **Metamaterials and their fascinating applications**
12. **Discovering black holes in our Galaxy**

Equivalent to face to face one week FDP

(Fulfils the requirements as per CAS of UGC and AICTE for the promotion requirements of College teachers)

For registration and more details

Registration Fees

International Delegates - Rs. 1500/-

National Delegates - Rs. 1000/-

Research Scholars - Rs. 500/-

ACCOUNT DETAILS:

A/C No: 12790100039629
Name: CHRIST COLLEGE
Bank: The Federal Bank Ltd.
Branch: Irinjalakuda
IFSC: FDRL0001279

National FDP on Quality Science Education in India in the 21st Century

3rd- 9th November 2020
3 p.m. to 6 p.m.

Inaugural Session 3rd Nov. 2020

CHIEF GUEST

Prof. A K SINGHVI
FNA,FASc,FNASc,FTWAS, FGS(Lon)
Vice President
Indian National Science Academy
New Delhi

KEYNOTE ADDRESS

Prof. A K BAKHSHI
Vice Chancellor
PDM University, Haryana

FELICITATION

Dr. VIMAL RARH
Project Head & Joint Director
GAD TLC Of MOE, GOI

FELICITATION

Fr. JACOB NJERINJAMPILLY CMI
Manager
Christ College (Autonomous),
Irinjalakuda

FELICITATION

Dr. ROBINSON P P
IQAC Co-ordinator,
Christ College (Autonomous),
Irinjalakuda

PRESIDENTIAL ADDRESS

Dr. Fr. JOLLY ANDREWS CMI
Principal
Christ College (Autonomous),
Irinjalakuda

Valedictory Session on 9th Nov. 2020

Valedictory Message

Dr. M K JAYARAJ
Vice Chancellor, University of Calicut
Alumni of Christ College

National FDP on Quality Science Education in India in the 21st Century

RESOURCE PERSONS

Prof. Kambadur Muralidhar
PhD FNASc FASc FNA, former Jawaharlal Nehru Chair, UoH,former Sir JC Bose National Fellow, SAU, former Head, Department of Zoology, DU

Mr. Vinay Kumar
Scientist/Engineer - SE, Photogrammetry & Remote Sensing Department, Indian Institute of Remote Sensing (ISRO), Dehradun

Prof. Amitava Das
FASc, FNASc, FRSC, Department of Chemical Sciences and Dean, Research and Development IISER Kolkata

Dr. Subrata Nandy
Scientist/Engineer - SE, Forestry and Ecology Department, Indian Institute of Remote Sensing (ISRO), Dehradun

Prof. S Lokanathan
Emeritus Fellow, University of Rajasthan

Mr. Prasun Kumar Gupta
Scientist/Engineer - SE, Indian Institute of Remote Sensing (ISRO), Dehradun

Prof. L Elango
Head, Department of Geology, Anna University, Chennai

Dr. V P Joseph
Department of Physics
Christ College (Autonomous), Irinjalakuda, Kerala

Dr. Kirpa Ram
Assistant Professor, Institute of Environment and Sustainable Development (IESD), Banaras Hindu University

Dr. Vishal Joshi
Astronomy & Astrophysics Division
Physical Research Laboratory
Department of Space, Government of India
Ahmedabad

Convenor
Dr. Linto Alappat
Asst. Prof. and Head,
Dept. of Geology and Env. Science
and Co-ordinator,
Christ College Teaching Learning Centre

Organizing Committee
Dr. Xavier Joseph
Dr. Titto Varughese
Dr. Subin K Jose
Dr. Manju N J
Dr. Bijoy C
Ms. Merin Jose V
Dr. Nandini C V
Mr. Jose Sunny
Dr. Devi K

Programme co-ordinators
Dr. K Y Shaju *(Vice Principal)*
Dr. C O Joshi *(Vice Principal)*
Fr. Joy P T CMI *(Vice Principal)*
Dr. Fr. Vincent N S CMI *(Bursar)*

Advisory Committee
Dr. Tessy Paul P *(Dean of Science)*
Dr. B P Aravinda *(Dean of Languages, Commerce and Humanities)*
Dr. Davis Antony Mundassery *(Controller of Examinations)*

IT Support
Ms. Vandana T V
Ms. Minu Mary P J
Mr. Linto George
Mr. Abhijith S Menon
Mr. Prajeesh A
Mr. Hariharan M

NATIONAL FDP ON QUALITY SCIENCE EDUCATION IN INDIA IN THE 21ST CENTURY

DAY 2 [04-11-2020; WEDNESDAY] [3:00- 6:00 P.M.]

INVITED LECTURE
[3:00-4:30 P.M.]
RESOURCE PERSON

Dr. VIMAL RARH
Project Head and Joint DIrector, GAD TLC of MOE, GOI

[4:30- 5:30 P.M.]
RESOURCE PERSON

Prof. AMITAVA DAS
FASc, FNASc, FRSC, Former Director CSMCRI and now Distinguished Prof in Chemistry, IISER

INTERACTION
[5:30- 6:00 P.M.]
RESOURCE PERSON

Dr. VIMAL RARH
Project Head and Joint DIrector, GAD TLC of MOE, GOI

Prof. AMITAVA DAS
FASc, FNASc, FRSC, Former Director CSMCRI and now Distinguished Prof in Chemistry, IISER

DAY 3 [05-11-2020; THURSDAY] [3:00- 6:00 P.M.]

INVITED LECTURE
[3:00-4:00 P.M.]
RESOURCE PERSON

Prof. K MURALIDHAR
FNASc, FASc, Department of Zoology, University of Delhi

INVITED LECTURE
[4:00- 5:00 P.M.]
RESOURCE PERSON

Dr. KIRPA RAM
Assistant Professor, Institute of Environment and Sustainable Development (IESD), Banaras Hindu University]

INVITED LECTURE
[5:00- 6:00 P.M.]
RESOURCE PERSON

Prof. K MURALIDHAR
FNASc, FASc, Department of Zoology, University of Delhi

DAY 4 [06-11-2020; FRIDAY] [3:00- 6:00 P.M.]

INVITED LECTURE
[3:00-4:00 P.M.]
RESOURCE PERSON

Mr. VINAY KUMAR
Scientist/Engineer - SE, Photogrammetry & Remote Sensing Department, Indian Institute of Remote Sensing (ISRO), Dehradun

INVITED LECTURE
[4:00- 5:00 P.M.]
RESOURCE PERSON

Dr. L. ELANGO
Professor & Head, Department of Geology, Anna University, Chennai

INVITED LECTURE
[5:00- 6:00 P.M.]
RESOURCE PERSON

Dr. VISHAL JOSHI
Astronomy & Astrophysics Division
Physical Research Laboratory
Department of Space, Government of India
Ahmedabad

NATIONAL FDP ON QUALITY SCIENCE EDUCATION IN INDIA IN THE 21ST CENTURY

DAY 5 [07-11-2020; SATURDAY] [3:00- 6:00 P.M.]

INVITED LECTURE
[3:00-4:30 P.M.]
RESOURCE PERSON

Dr. PRASUN KUMAR GUPTA
Scientist/Engineer - SD, Geoinformatics Department,
Indian Institute of Remote Sensing (ISRO), Dehradun

INVITED LECTURE
[4:30- 6:00 P.M.]
RESOURCE PERSON

Dr. SUBRATA NANDY
Scientist/Engineer - SE, Forestry and Ecology
Department, Indian Institute of Remote Sensing (ISRO), Dehradun

DAY 6 [08-11-2020; SUNDAY] [3:00- 6:00 P.M.]

INVITED LECTURE
[3:00-4:00 P.M.]
RESOURCE PERSON

Dr. PRASUN KUMAR GUPTA
Scientist/Engineer - SE, Geoinformatics Department,
Indian Institute of Remote Sensing (ISRO), Dehradun

[4:00- 6:00 P.M.]

PRACTICAL SESSION- QGIS SOFTWARE

DAY 7 [09-11-2020; MONDAY] [3:00- 6:00 P.M.]

INVITED LECTURE
[3:00-4:00 P.M.]
RESOURCE PERSON

Dr. S. LOKANATHAN
Emeritus Fellow, University of Rajasthan

INVITED LECTURE
[4:00- 5:00 P.M.]
RESOURCE PERSON

Dr.V.P. JOSEPH
Christ College Autonomous,
Irinjalakuda, Kerala

[5:00- 6:00 P.M.]

VALEDICTORY, ASSESSMENT AND EVALUATION

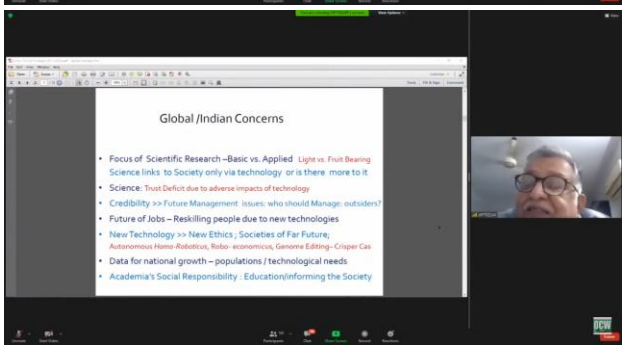
DAY 1

(03-11-2020; Tuesday) 3:00 to 6:00 p.m.

Inaugural Session

The programme commenced with a welcome note by Dr. C. O. Joshi, Vice Principal, Christ College (Autonomous), Irinjalakuda. The inaugural session was presided over by Rev. Dr. Fr. Jolly Andrews, CMI, Principal, Christ College, Irinjalakuda. Dr. Vimal Rarh, Project Head and Joint Director, Guru Angad Dev Teaching Learning Centre, Ministry of Earth, Government of India presented an overview of the programme. Dr. Rarh completed her post doctoral studies from IIT Delhi. She was the Academic Secretary, ICT at Institute of Lifelong Learning, University of Delhi. She has more than 10 years of experience in developing and coordinating the preparation of e-Learning materials. She has been a part of many National and International conferences and workshops for understanding and delivering talks on many aspects of e-Learning Technologies. Delivered many lectures on ICT integration with Higher Education in Delhi University, ILLL initiatives for e-Learning in DU etc in Orientation and Refresher courses at CPDHE. She was the incharge for Delhi University's First ever ONLINE EXAMINATION. Worked as ICT Incharge for the development of e-content and for LMS-MOODLE deployment, customization and management for the pilot projects. Authored two chapters for the "National Science Digital Library project' of NISCARE, a division of CSIR, with the active collaboration of UGC and Ministry of HRD. Delivered many lectures on ILLL initiatives for e-Learning in DU and motivation of teachers for contribution in e-content development in various Delhi University Colleges. Incharge of the Delhi University's e-Learning Portal (www.illldu.edu.in). Incharge for this website for Institute of Lifelong Learning which she has designed in JOOMLA, an open source Content Management System. In her talk she stressed the significance of ICT skills and pedagogy for blended, virtual and online teaching. She also mentioned the role of GAD – TLC in helping the teachers upgrading their skills in development of open educational resources which will be empowering them for effective classroom dissemination. The formal inauguration was done by the chief guest of honour Prof. A. K. Singhvi, Vice President, Indian National Science Academy, New Delhi. Professor Ashok Kumar Singhvi, is a renowned scientist in the field of Quaternary Climate and Geochronology, Radiation Effects and Dosimetry. Singhvi established an internationally acclaimed luminescence dating laboratory in India and contributed extensively to the paleoclimate studies in India. He pioneered the luminescence dating of desert sands and provided an understanding of the time evolution of deserts across the world. His work has changed many conventional concepts dealing with the interpretation of sediment record vis-a-vis climate. Dr Singhvi has helped to establish nine luminescence dating laboratories in India and four overseas. He has authored over 160 articles in peer reviewed journals, edited/authored about 12 conference proceedings/books including two INSA reports to the International Union of Geological Sciences. He also supervised 11 PhD students. He played a key role towards Indian

membership to INQUA and was the leader of Indian delegation to IUGS in 2004 and 2008. He is on the Editorial boards of six international journals. He is also serving as INSA Council Member (2006-). He has been Member of the Science Programme Committee of UN sponsored International Year of Planet Earth and of the Executive Board of the Scientific Steering Committee of IGBP- PAGES core project. His work at PRL marked a distinct change from hyperfine interaction, Moessbauer spectroscopy and nuclear reactions to luminescence spectroscopy of minerals, geochronology and paleoclimatology. He has been a Ford Foundation Fellow (Oxford and St. Louis); A.v. Humboldt Fellow (Heidelberg), Lever hulme Fellow (Sheffield), DFG Professor (Freiberg), Academy Professor (Sao Paulo) and Visiting Professor (USGS Denver). In the brief inaugural address he highlighted the expectations from a teacher on a broader perspective. He specified the interaction between science and society, technological challenges, how do teachers impact and contribute to policies and decision making and the necessity of reskilling continuously to adopt to new technologies. In his opinion our fundamental approach to education, course curriculum should inculcate more of analysis and thinking process and as teachers we need to assume responsibility and deliver to the nation a society that is competent, confident, reasonable, ambitious, rational and ethical. Rev. Fr. Jacob Njerinjampilly, CMI, Manager, Christ College also graced the occasion by his words.



The keynote address was given by Prof. A. K. Bakhshi, Vice Chancellor, PDM University, Haryana. He was Executive Director of Tertiary Education Commission (TEC), Mauritius (a post

equivalent to that of Chairman, UGC in India) during October 2013 – February 2015. Prof. Bakhshi held the prestigious Sir Shankar Lal Chair of Chemistry in the University of Delhi for more than two decades and was also Head, Department of Chemistry, University of Delhi during May 2010–August 2011. He has also been a Visiting Professor at GGSIP University, Delhi during 2007. Prof Bakhshi is also presently Chairman of National Resource Centre of Chemistry (NRCC) of the MHRD, Guru Angad Dev Teaching – Learning Centre of the MHRD and Centre for e-Learning, all the three centres located at SGTB Khalsa College, University of Delhi. Prof. Bakhshi has also been the Director of the Institute of Lifelong Learning (ILLL) as well as of Centre for Professional Development in Higher Education (CPDHE) of University of Delhi during 2008-2010. In his capacity as Director ILLL, he spearheaded the process of e-transformation of the University of Delhi and also introduced many skill based programmes. ILLL under his leadership conducted the first On-line examination in the history of Delhi University in the years 2009 and 2010. A double gold medalist and PhD of Delhi University, Dr. Bakhshi did his post-doctoral training at the University of Erlangen-Nurnberg, Germany with Prof. J. Ladik and at the Kyoto University and the Institute of Fundamental Chemistry, Kyoto, Japan with Professor K. Fukui, the Nobel Laureate and Prof. T.Yamabe. He has also been a Visiting Scientist at the Tata Institute of Fundamental Research (TIFR), Mumbai (1989 and 1991) and the Indian Institute of Science (IISc), Bangaluru (1987 and 1992). Prof. Bakhshi's research interests include theoretical polymer chemistry with special reference to electrically conducting polymers and biopolymers. He is the author/coauthor of more than 170 research and education articles etc., and one patent. He has to his credit 11 books as author/co-author, 51 e-Books/Books as editor/chairman/ convener of the working group and 49 e-modules as author/coauthor for PG chemistry courses. Many students (18) have obtained their Ph.D / M.Phil under his guidance. He has had research projects from CSIR, UGC, DAE and DST.

Prof. Bakhshi has been recipient of several awards and academic honours. These include amongst others: World Education Award (2017); Haryana Ratan award (2016); Bharat Jyoti Award (2016); India Didactics Association (IDA) 2014 Special Award for excellence in Digital Content in Education; Guest of Honour at the 26th IGNOU Convocation at Varanasi (2013); National Education Award by Headlines Today News Channel (2012); Bioved Honorary Fellowship (2012); Dr. R. D. Desai Award of the Indian Chemical Society (2009), Prof. P.K.Bose Memorial Award of the Indian Chemical Society (2008); Fellowship of the IUPAC (2006); Distinguished Teacher Award (2000); Chemical Research Society of India (CRSI) Medal (2000) ; Fellowship of the National Academy of Sciences (FNASc) (1997); JSPS Fellowship of Japan (1995); C.S.I.R Visiting Associateship (1991); INSA Research Fellowship (1990); UGC Career Award (1989); Visiting Fellowships of the DAAD (1988, 1992 and1996); Best Paper Award in the field of Chemical Sciences from DAAD (1986); DAAD Fellowship of Germany (1984); Young Chemist Award (1983); Dr. Krishan Rao Gold Medal (1978), Prof. R.P. Mitra Gold Medal (1973) etc.

In his presentation entitled 'Achieving excellence in science in India in the 21st century' he specified the requirements of an outstanding teacher/ researcher and pointed out that one of the main reasons for poor world ranking of our higher education institutions is poor quality of our research programmes. Prof. Bakhshi also stressed the need for carrying out globally competent but locally relevant research. The inaugural session concluded with the vote of thanks by Dr. Tessy Paul P., Dean of Science, Christ College, Irinjalakuda.

Day 2: 04-11-2020; Wednesday at 3:00 p.m. - 6:00 p.m.

[3:00-4:30 pm] Dr. VIMAL RARH, Project Head and Joint Director, GAD TLC of MOE, GOI on "Role of Science Teachers in Technology Driven Higher Education".

[4:30- 6:00 pm] "Realigning Science, Society and Education in Chemistry" by Prof. Amitava Das, FASc, FNASc, FRSC, Former Director CSMCRI and now Distinguished Prof in Chemistry, IISER.

Dr.VIMAL RARH; *Project Head and Joint Director, GAD TLC of MOE,GOI*

A brief Introduction of Dr. Vimal Rarh

Dr. Vimal Rarh is a senior Chemistry Faculty at SGTB Khalsa College, University of Delhi who did M.Sc and Ph.D from University of Delhi and Post doctorate from IIT Delhi. With a decade of experience in the corporate e-learning world, she is amongst the pioneers in implementing ICT in Higher education in the country and is a tech-savvy teacher. Apart from her e-learning expertise, she has her research interest in Forensic Science and Organic Chemistry. Dr Vimal Rarh is a leading women edupreneur in the field of e-learning with a decade of experience in the corporate e-learning sector as well. She has to her credit many research papers, a patent, books, presentations, projects and invited talks at local, National and International forums. She is one of the leading e-learning experts of India who has made a mark at the national level in various activities such as development of e-content, Teacher's e-kit, MOOCs, empowerment of teachers in ICT skills, introduction of newer teaching methodologies etc. not only in chemistry but guided the same for many other disciplines as well.

She is also managing three centres working in the field of e-learning at the National level over and above her teaching responsibilities. She is the only Chemistry teacher of the country to be awarded the National Resource Centre of Chemistry of MHRD, Govt. of India, for developing ARPIT courses two times in a row for all Chemistry teachers of India. As Joint Director and Project Head of Guru Angad Dev Teaching Learning Centre (GAD-TLC) of MHRD, Govt. of India , she has

trained more than 25,000 teachers and as Deputy Director of Centre for e-Learning, SGTB Khalsa College, she has developed more than 50 MOOCs in 4 quadrant format for SWAYAM platform. She is contributing in policy making at national level in various committees like Online Courses Regulations – 2018 of UGC, e-Governance Committee at UGC and e-Content Committee for National Educational Alliance in Technology (NEAT) of AICTE. She is a Governing Body Member of around 10 autonomous colleges of the country. She is also the Member of newly form Committee to Review and continue the epGPathshala project in next phase at UGC. She has guided development of Video Studios for many institutions, including for AICTE.

Dr Rarh has been conferred with various awards like Edupreneuer Award by Minister of Education, Behrain, Delhi Ratan Award, Edupreneur Innovator Award to name a few.One of the 3 case-studies as best MOOCs from India on her designed MOOCs has been published in the "Australian and Indian quality assured online learning" by Australia India Institute for Department of Higher Education & Training, Australia Government. She has been recently selected to be awarded the prestigious Indian National Science Academy (INSA) Teacher Award-2020.

Topic-Role of Science Teachers in Technology Driven Higher Education

Learnings

In the first session Dr. Vimal Rarh explained what is the *Role of Science Teachers has in Technology Driven Higher Educatio*n. Dr. Rarh connected the role of a teacher in the classroom teaching with chalk and board to the modern teaching platforms. She described how the process of metamorphosis needs to happen for a chalk and board teacher to modern day techno-savvy teacher when it comes to deal with a student who is more into the world of an Internet of Things. She emphasized the importance of evaluation in the teaching learning process. Dr. Rarh was very clear in her lecture that Science teaching is much more fun and interactive in an online mode and it is most effective when the online course is designed as a four quadrant module. The idea of choice based credit system can be fully integrated in an online teaching learning process as the students can seamlessly choose the abundantly available courses. The overwhelming advantage of CBCSS in helping students to find suitable career by the combination of courses they choose and hence the widening of the scope of the programme he/she studied is pointed out in her talk. To that to happen, the teachers must be ready for the changes which are coming into their way and if not, they will become redundant was the crux of her session.

Day 2, Session 2

Prof. AMITAVA DAS *(FASC, FNASc, FRSC, Former Director CSMCRI and now distinguished prof in Chemistry IISER)*

A brief Introduction of Prof. Amitava Das

Awards & National Fellowships:

- DST-J.C. Bose National Fellow, 2017
- Fellow of the Indian National Science Academy, 2017
- Fellow of Gujarat Science Academy, 2016
- Silver Medal awarded by Chemical Research Society of India, 2016
- Prof. Suresh C. Ameta award for 2015 by Indian Chemical Society.
- Fellow of the National Academy of Science (2012).
- Fellow of the Indian Academy of Science (2010).
- Bronze Medal awarded by Chemical Research Society of India, 2009.

Patents & Publications:

- 200 plus
- Patents: 19 (Granted or Filed/ under review)
- h-Index: 48

Topic- Realigning Science, Society and Education in Chemistry

Learnings

Prof. Amitava Das

In the first session Prof. Amitava Das explained about ***Realigning Science, Society and Education in Chemistry*** for the present and future perspectives. Professor emphasized the way the research in science needs to be aligned with sustainable development of the society. Instead considering the minimialist resource consumption approach, Professor Amitava Das was in favour of improving technology for better utilization of the available resources. He described how the recycling and reusing need not considered in terms of cost effectiveness. The emphasis was upon to reorient our views as a consumer and Industrial models based on depleting raw materials in terms of minimum cost of production to the overall of cost of production in terms of reusability. He was very clear in his lecture about the need to educate the society in that perspective. Prof. Amitava Das was all for technological advancement to minimize the environmental impact since the population growth and affluence, the other two factors are difficult parameters to rely upon. He was hopeful that within a decade the population growth is not going to be a big issue however, the affluence of the human society is not going to decrease. The crux of the lecture was that Environmental **I**mpact based on IPAT equation, the **P**opulation, and **A**ffluence of the human society is not where we need to look into, but to the last term of IPAT ie, **T**echnology.

DAY 3- (05-11-2020; Thursday) 3:00 to 6:00 p.m.

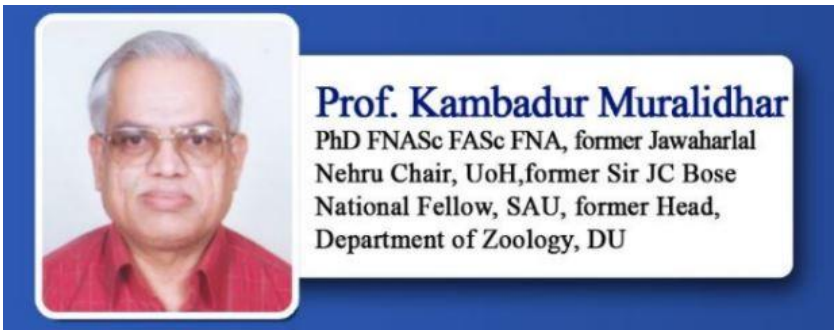
[3:00-4:00 pm]: How to organize teaching of integrated Biology at UG level?-Implications of NEP-2020.– History and Philosophy of Natural Science. [Resource Person: Prof. K Muralidhar, FNASc, FASc, Department of Zoology, University of Delhi]

[4:00- 5:00 pm] – Air pollution and climate change.] [Resource Person: Dr. Kirpa Ram, Assistant Professor, Institute of Environment and Sustainable Development (IESD), Banaras Hindu University]

[5:00- 6:00 pm] – How to organize teaching of integrated Biology at UG level?-Implications of NEP-2020 [Resource Person: Professor K Muralidhar, FNASc, FASc, Department of Zoology, University of Delhi]

SESSION 1: INVITED LECTURE (3:00 TO 4:00 P.M.)

RESOURCE PERSON:



Kambadur Muralidhar is a distinguished Biologist of India and was born at Coimbatore, Tamil Nadu. He obtained his PhD from IISc, Bangalore in 1976. His PhD work, demonstrating beta subunit of Luteinizing Hormone can bind ovarian receptors fetched him the Prof K.V. Giri Memorial Gold medal for the best PhD thesis of the year. During 1979-81 he was a Research Associate in the Department of Cell and Molecular biology at SUNY, Buffalo, New York, USA. His work led to the development of the most sensitive RIA for HCG, a pregnancy hormone. He joined the University of Delhi in 1983 as Reader in Biochemistry, Department of Zoology and became a Professor in Endocrinology & Biochemistry in 1988. Professor Muralidhar initiated a long-range research programme on water buffalo endocrinology. He has over 140 published articles in peer reviewed journals and books as chapters. Professor Muralidhar is an outstanding teacher and has taught courses in Biochemistry, Gamete Biology, Immunology, Endocrinology and Cell Biology and Medicinal Chemistry at University of Hyderabad, University of Delhi, and

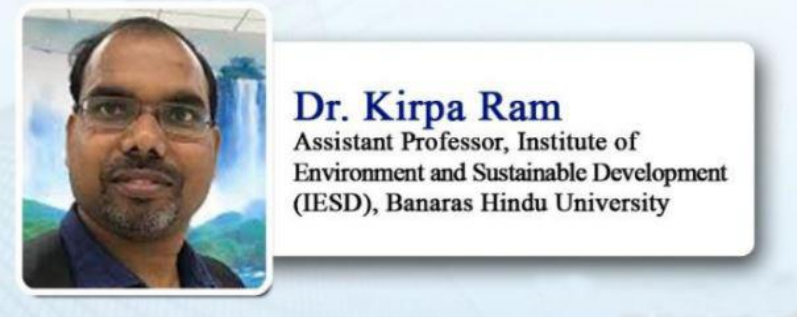
now at South Asian University. So far, he has mentored 26 PhD and 27 M.Phil. research students besides training over 2500 MSc students. Professor Muralidhar is a renowned Educationist of our country. He was Chairman of the UGC Curriculum Development Committee for Zoology and brought out a bench mark report on MSc and BSc in Zoological sciences. For NCERT he brought out the new textbooks for higher secondary school biology in a completely new format backed by a sound philosophy. These two text books of Biology for classes XI and XII ranked among the top 5 such level books among 750 reviewed in the world. He assisted University of Delhi in restructuring Undergraduate Science Education and introduced a new Honours course in Integrated Biology which is first of its kind in the country. He was the convener of the NET examination and brought more balance in the examination giving representation to all important areas of Biology. He was the Chairman of the PAC-Animal Science of DST for three terms and nurtured research in this area. He has assisted all the funding agencies like CSIR, UGC, ICMR, DBT, DST, MOEF, and ICAR in various capacities. He has served on the Research Advisory Committees of CCMB, IGIB, MRC, NBRC, ARI and NII besides assisting in the selection and promotion of Faculty in a number of Educational and Research institutions of our country. He has adjudicated on more than 332 PhD theses from over 35 Universities and Research institutions. Professor Muralidhar is an elected Fellow of all the Science Academies of our country i.e. NASI, Allahabad, INSA, New Delhi and IISc, Bangalore. He was the Chief Editor of the Proceedings of Indian National Science Academy for over 6 years when he transformed the journal and brought international recognition. Following superannuation in December, 2013. Kambadur Muralidhar joined the South Asian University as an Honorary Professor in January, 2014 and continued till December, 2016. He taught a 2-credit course on Ethics in Science for the research scholars of SAU. Upon invitation, he joined Hyderabad Central University as Jawaharlal Nehru Chair Professor in 2017. He was also a visiting Professor to School of Life Sciences for six months in 2018. He continues to be a Member of SERB, New Delhi till 2019.

TITLE OF TALK: ***'History and Philosophy of Science'***

LEARNINGS: In the first session, Prof. Muralidhar explained the historical and philosophical perspective of Natural Science. He started his lecture by pointing out some issues of concern in higher education. He then pointed out what is common in philosophy and science, both which seek the answer of same question- 'truth about life'. Prof. Muralidhar detailed the origin of Science at Europe during post-renaissance period. He tried to define Science, its nature and also explained the limitations as well. Professor emphasised four dimensions of education and connected the role of creativity in science. He summarised how in our educational context; Science creates a new responsible citizen. Last but not the least, when the session was open for questions, participants were keen to ask questions and with same level of enthusiasm they were justifiably answered by professor.

SESSION 2: INVITED LECTURE (4:00 TO 5:00 P.M.)

RESOURCE PERSON:



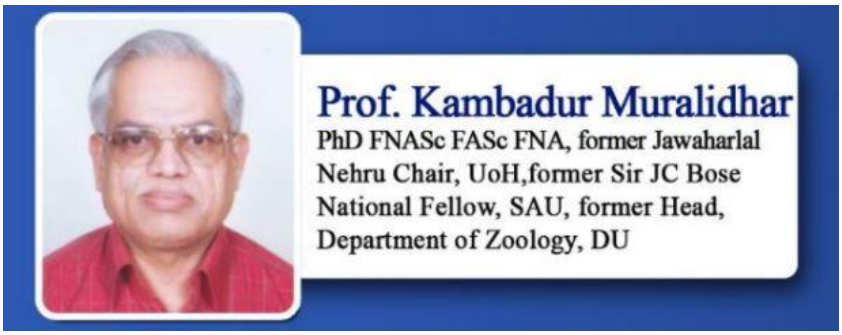
Kripa Ram is an Assistant Professor of Indian Institute of environment and Sustainable Development, Banaras Hindu University, Varanasi. He has completed his PhD from Physical Research Laboratory, Ahmadabad in 2010. He worked as a scientist at NEERI, Nagpur. He was an INSPIRE faculty at IIT, Bhubaneswar. He was a pot-Doc at University of Tokyo, Japan. His filed of specialization in research is Atmospheric chemistry, aerosols and climate change. He is an author of more than 50 research papers and he has 3 book chapters to his credit. He is in the Editorial Advisory Board of Environmental Science and Technology journal, only the second scientist from India.

TITLE OF TALK: ***'Greenhouse gases and aerosols in Earth's atmosphere'***

LEARNINGS: Dr. Kripa Ram started his lecture by explaining how the Green House gases and aerosols in earth's atmosphere impact on us. For answering that question, he pointed out the uniqueness of earth and factors controlling the climate of the planet. He then pointed out composition of earth's atmosphere, earth's climate system, solar emission spectrum etc. Dr. Kripa Ram detailed about the role of Ozone in stratosphere and its production through Chapman's cycle. He then tried to connect the atmospheric aerosols and India's multifaced problem of air pollution which adversely affects the public health. He summarised the sources and remedies for air pollution and overall, the session was very useful to the participants.

SESSSION 3: INVITED LECTURE (5:00 TO 6:00 P.M.)

RESOURCE PERSON:



TITLE OF TALK: ***'How to Organise Biology Teaching'***

LEARNINGS: In the second lecture of the day, Prof. Muralidhar detailed about how to organise biology teaching in Higher Education sector. He started his talk defining biology as a science of studying living organism and then he explained the historical perspective of Biological Science which he splits into 3 phases, In Vivo, In Vitro and In Silico. He summarised the aims of Biology and pointed out the issue of having too much diversification or specialization in Biology. He then pointed out the need of the hour- to have an Integrated approach in Biology learning. Professor emphasised the problem of having too much sub-disciplines and stressed the need of Interdisciplinary approach. Professor pointed out the diversification in Biology should be brought in at UG level, not from schools. He summarised the need for having courses like Biological Science in Universities and affiliated colleges. The talk was followed by good number of questions from participants, which he answered authoritatively.

Day 4: 06-11-2020; Friday at 3:00 p.m. - 6:00 p.m.

[3:00-4:00 pm] – Overview of Remote Sensing and its applications [Resource Person: Mr. Vinay Kumar, Scientist/Engineer - SE, Photogrammetry & Remote Sensing Department, ISRO (NRSC-IIRS)]

[4:00- 5:00 pm] – Ground water quality assessment and monitoring techniques. [Resource Person: Dr. L. Elango, Professor & Head, Department of Geology, Anna University, Chennai]

[5:00- 6:00 pm] – Discovering Black holes in our Galaxy [Resource Person: Dr. Vishal Joshi, Astronomy & Astrophysics division, Physical Research Laboratory, Ahmedabad (India)

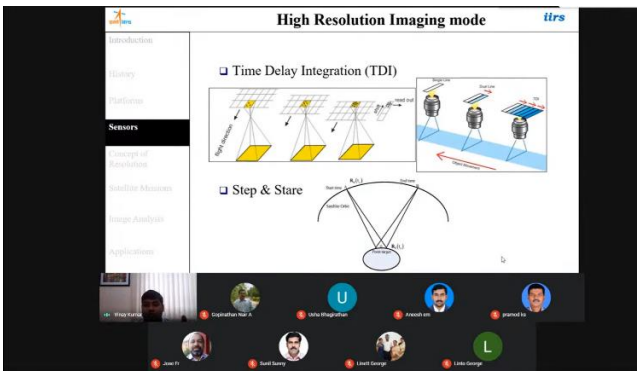
On Day 4 we had three distinguished resource persons to deliver the lectures. The first session was handled by Mr. Vinay Kumar, Scientist from ISRO, the second session was presented by Prof. L. Elango, from Anna University and last session of the day, 3rd session was given by Dr. Vishal Joshi from Physical Research Laboratory, Ahmedabad. The lectures covered the topics starting from basics of Remote Sensing and GIS to Groundwater and ended up in Black holes.

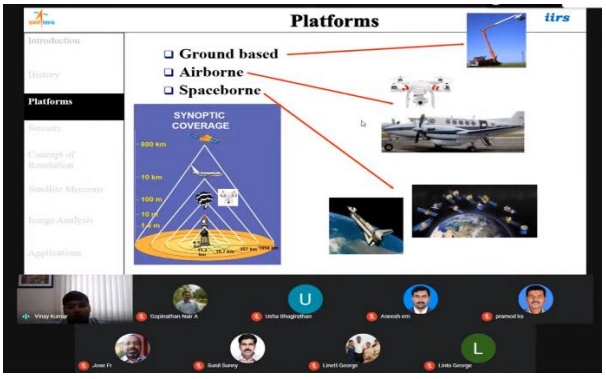
1st Session (Resource Person Mr. Vinay Kumar; Time 3.00pm- 4.00pm)

On day 4, the first session was handled by Mr. Vinay Kumar, Scientist/Engineer in the Department of Photogrammetry and Remote Sensing at Indian Institute of Remote Sensing, Indian Space Research Organization, Govt. of India, Dehradun. Mr. Vinay Kuma's thrust areas of research is Hyperspectral Remote Sensing, Automated endmember extraction, Simulation of Hyperspectral data and Fusion of Hyperspectral and Microwave Remote Sensing data. He has authored and coauthored a number of national and international research papers also received the best paper award in ICMARS-214. Mr. Kumar is basically a mining engineer and has completed his M.Tech. in Geomatics Engg. from IIT Roorkee. During the past ten years of his career from now, Mr. Kumar has given training in remote sensing, image processing & hyperspectral remote sensing at IIRS and other prestigious organisations. As a part of administrative assignments, he has coordinated and supported the conduction of various courses, training and other capacity building programmes at IIRS.

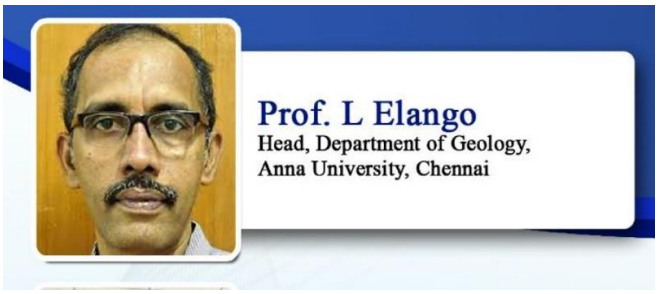
Learnings

He had delivered an informative lecture on “Overview of Remote Sensing and its applications”. He explained the basics of Remote Sensing from scratch and its application in daily life in detail. Each of his presentation slides was very much clear and vivid. The pictorial and multimedia representations were highly appreciable. His long years of experience in teaching is clearly visible in his explanations and detailing of the subject. First, he explained the basic elements of Remote Sensing and Principles. He explained Sensors, Platforms, and Satellites etc. How the sensors are working, how the selection of platforms was being done and what are the different types of satellites are there; he explained all these in detail. Also discussed the different resolution of digital images, what are the image interpretation keys, and what are different image processing techniques etc. He gave an insight into the importance of Electromagnetic spectrum in the Remote Sensing; how each band in the images differs from each other in its application. He gave a glance on the history of Remote Sensing and the about the various National and International space missions; What are the different Indian Space missions and its significance; Also on Geospatial application through the web portal. He concluded the presentation by giving various practical applications of digital image processing in various sectors and how digital image processing is important in understanding the images to get the required output. Mr. Vinay Kumar’s presentation was highly informative and understandable to everyone. His talk will help the participants to understand the basic principles and its higher applications in Forestry, Fisheries, Climate studies, Glacier and Snow studies, Watershed analysis, Urban planning, Groundwater studies, Town planning etc.





2nd Session (Resource person: Dr. L Elango, Time 4.00pm-5.00pm)



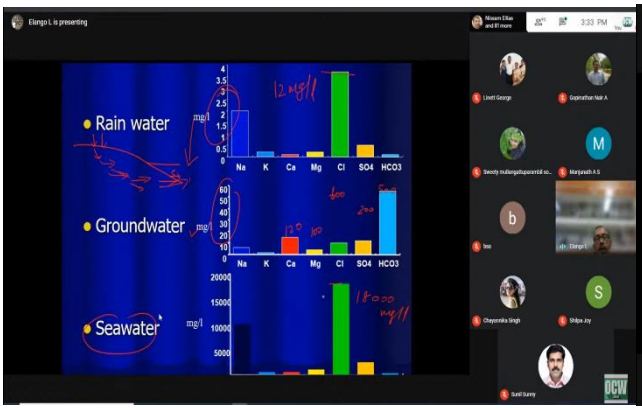
On day 4, the second session was conducted by Dr. L Elango on "Groundwater quality assessment and monitoring techniques". Dr. L Elango is Professor and Head in the Department of Geology, College of Engineering, Anna University, Chennai. He is a renowned teacher and a researcher in the field of Hydrogeology, Exploration Geophysics and Groundwater Modeling. He has more than 30 years of experience in teaching and research in the field of Geology, Hydrogeology and Groundwater Modeling. He pursued his doctoral degree from Centre for water resources, Anna University, and received his post-doctoral degree from School of Earth Sciences, Univ. of Birmingham, U.K in Groundwater Modelling. Also, he possesses a post-graduate Diploma in Integrated Coastal Zone Management from the prestigious Universities of New Castle & Bath, U. K.

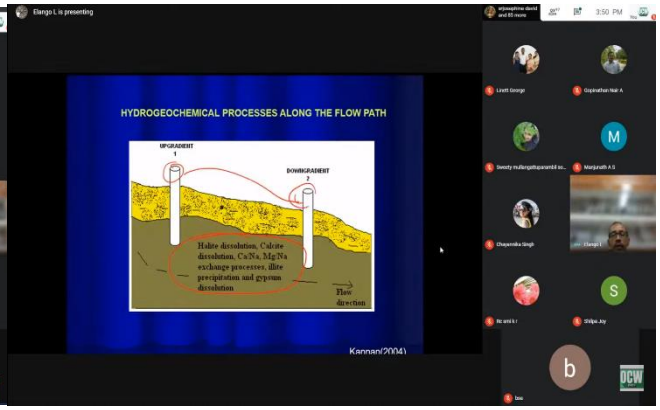
He has published more than 262 scientific journal papers with over and above 5000 citations. He has supervised many MSc students, more 25 PhD students, and Post Docs. He is a Guest Professor in the Department of Earth Science, Uppsala University, Sweden and Adjunct Faculty in the Centre for Climate Change and Adaptation Research, Anna University. Deputy Coordinator and Professor at the Centre with Potential of Excellence in Environmental Science, Anna University. He is member of various national and international professional bodies. Apart from being an eminent teacher he also handled a number of reputed positions (President, Vice-president, Editor, Associate editor and advisory committee member etc.,) in his professional life. He was honoured for his excellence in research by more than 7 national and international prestigious awards.

Learnings

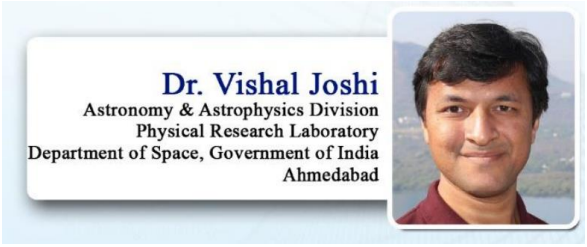
The lecture was given by Dr. L. Elango on "Groundwater Quality assessment and monitoring techniques" was highly enlightening. At the beginning of the presentation, he dealt with the importance of groundwater quality, how it is getting deteriorated in these days and what are the physicochemical parameters that affect the quality of groundwater. He also explained the role of space, time, geology, land use, variation in rainfall, pumping, and Geochemical processes in the variation of groundwater quality. Then he also showed the importance of water quality analysis and modelling to identify and remediate the groundwater pollution in different places through case

studies. He discussed three case studies which deal with the groundwater quality issues due to various reasons. The first one was dealing with how the agricultural activity affects the groundwater quality; Second case study was dealing with the Mining and its subsequent groundwater quality issues and the third one was in Munich, Germany how the tar oil leak had led to groundwater issues and its further remediation. In these three case studies professor emphasis the role Modelling in identifying and simulating the groundwater quality issues. He winded up the session by pointing the use of water analysis and modelling in rectifying the quality issues of groundwater.





3rd Session (Resource Person: Dr. Visha Joshi, 5.00pm -6.00pm)



On day 4, last session of the day was given by Dr. Vishal Joshi, who is currently working as a Scientist in Astronomy & Astrophysics division, Physical Research Laboratory (PRL), Department of Space, Government of India, Ahmedabad. He has been working in the field of Astronomy & Astrophysics for over 12 years. After getting the master's degree with gold medal in Physics from Saurashtra University, Dr. Joshi joined PRL as a Research scholar. He completed his PhD on observational studies of magnetic Cataclysmic Variable stars. He won the Post-doctoral Fellowship award from Inter-University Centre for Astronomy & Astrophysics (IUCAA), Pune, where he obtained valuable experience in the field of astronomical instrumentation. He joined PRL as a Scientist from 2016.

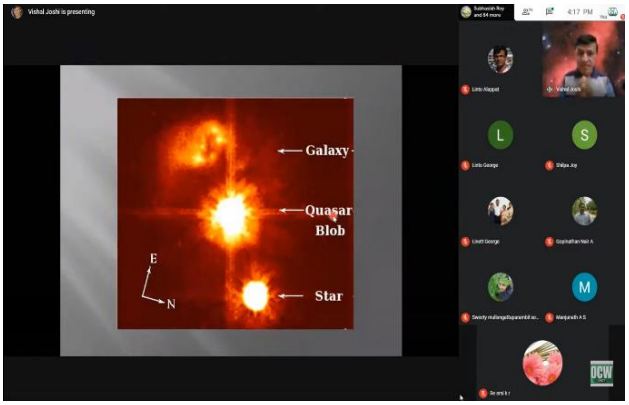
During his research career, he has made a significant contribution to the understanding of various physical, orbital and geometrical aspects occurring on and around novae, supernovae and other variable stars using ground and space-based observations, models, simulations and theory. He is currently working on the project to commission 2.5m class telescope at Mount Abu observatory which is going to be the second-largest telescope of India.

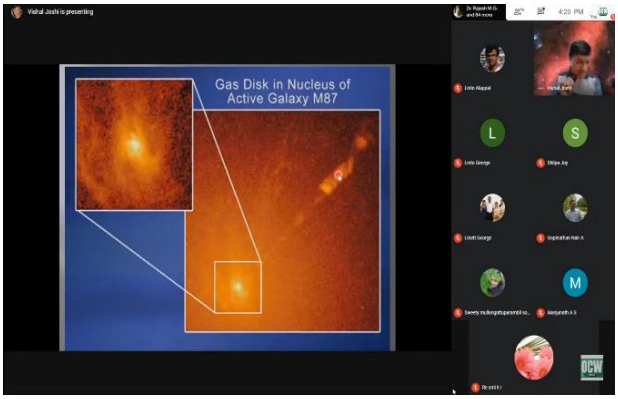
He had published more than 30 scientific research papers in different reputed national and international journals, including in Springer's Nature. He is a lifetime member of various recognised professional bodies.

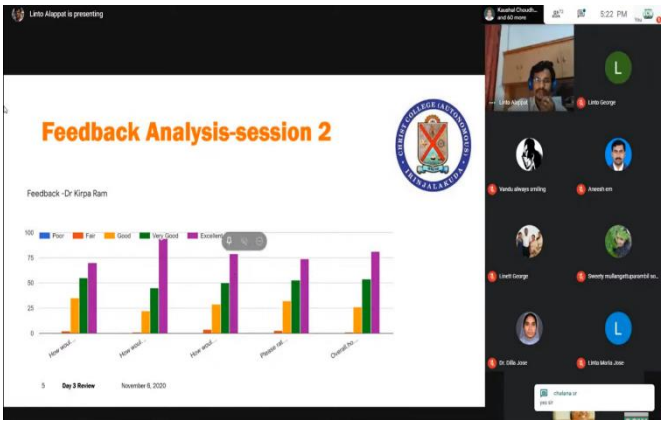
Learnings

Dr. Vishal Joshi has delivered a highly intellectual talk on “Discovering Black holes in our Milkyway Galaxy” He started his talk on mentioning about the Nobel Prize winners of 2020 in physics. Roger Penrose, for the discovery, that black hole formation is a robust prediction of the general theory of relativity. Reinhard Genzel and Andrea Ghez, for the discovery of a supermassive compact object at the centre of our galaxy. He also talked about the Quasar blob, the extremely bright object in the space, they are brighter than the normal galaxies. Also gave an idea of how the scientists are working on space and other elements to find out the details of them. Study on Galaxy M-87 and the identification of multilayers. He gave a sneak-peek into Nebulae, Super Nova, White dwarfs etc. In the entire speech, he detailed on the theory of the formation of Blackholes, How the black holes formed theoretically and how it is discovered in our galaxy. The talks gave great insight into the Blackholes to the participants.

At the end of 4th day, Dr.Linto Alappat, the convenor of the Faculty Development Programme had presented the Day 3 statistics of participant response. Past three days' sessions went well and received excellent feedback from the participants.







Day 5: 07-11-2020; Saturday at 3:00 p.m. - 6:00 p.m.

[3:00-4:30 pm] – Geographic Information System (GIS) and its applications [Resource Person: Dr. Prasun Kumar Gupta, Scientist/Engineer - SD, Geoinformatics Department, ISRO (NRSC-IIRS)]

[4:30- 6:00 pm] – Application of Geospatial Technology in Forestry and Ecology [Resource Person: Dr. Subrata Nandy, Scientist/Engineer - SE, Forestry and Ecology Department, ISRO(NRSC-IIRS)].

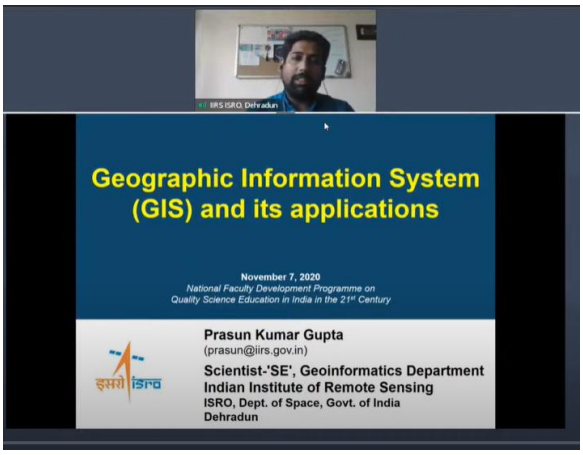
Dr. Prasun Kumar Gupta, Scientist/Engineer - SD, Dept. of Geoinformatics, *IIRS* ISRO

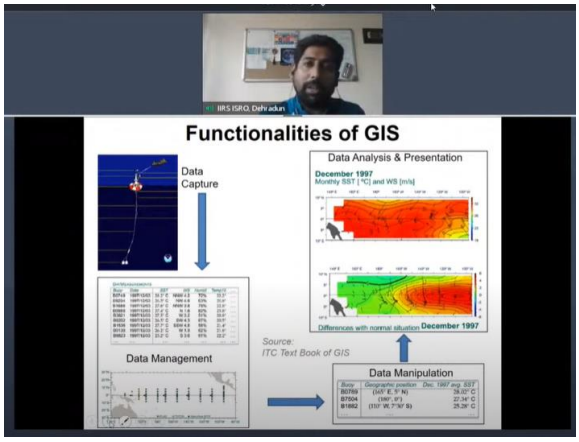
Dr Prasun Kumar Gupta is a Scientist/Engineer - SD in the Dept. of Geoinformatics, at Indian Institute of Remote Sensing (IIRS), Indian Space Research Organisation (ISRO), Department of Space (DOS), Govt. of India (GOI), Dehradun. His field of expertise include Programming & Application Development, Open Source GIS and Modelling. He completed his B E in 2006 from Visvesvaraya Technological University, Bangalore, Oracle Certified Associate from Oracle University and PG diploma in intellectual property rights from National Law School of India University and joined in IIRS as a Scientist in 2008. He did his Masters in Remote sensing and GIS from IIRS with thesis titled "Temporal granularity in land surface parameters & gravity anomalies and their relation with land-use/land-cover and climate over India". He received the Pat on the Back" award from Tech Mahindra Ltd, for excellent work at client location in Sensis, Melbourne, Australia. Projects undertaken at academic level include: (a) Seminar on "Quantum Computing", (b) Development of a CAN (Controller Area Network) module using Embedded C and C++. Professionally he has worked with clients across the globe with the likes of Unisys (NZ), BT Global Services (UK), Orange (Israel), Sensis (Australia) and Telecom (NZ).

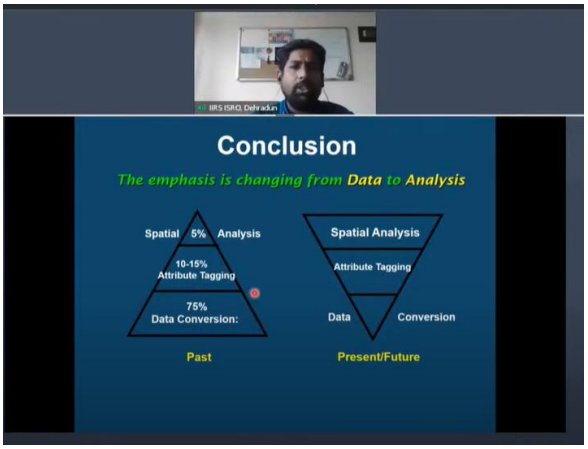
Learnings

The fifth day of FDP started with the talk on by Dr. Prasun Kumar Gupta. He has explained geospatial technology in brief and from the basic of Geographical Information system (GIS) to its applications in detail. His lecture included the functionalities of GIS from data capture, data management, data manipulation, data analysis and presentation. The components of GIS i.e., the hardware, software, manpower, network and data were described in the lecture. One of the most important part in GIS is the data. He explained spatial data input, file format, raster, vector data and overlay operations in detail. Different application of digital elevation model (DEM) such as flood modelling, slope failures and hydrological applications has explained and he informed available data resources for the modelling for example, Cartosat data from ISRO (www.bhuvan.nrsc.gov.in). He introduced the open source softwares like QGIS which anyone can easily access and can be used in their own area of research interest. He explained the various applications of GIS the technology which is applied in interdisciplinary science. He concluded the talk by giving a Quote "The application of GIS is limited only by the imagination of those who use it". He suggested teachers can use QGIS is freely available to download and easily to make

students understand the basic concepts of GIS. He delivered a practical session of QGIS in the sixth day of FDP connecting this talk. Dr. Gupta clarified the questions and doubts from participants about the error or uncertainty in the data, the simulations in GIS data, internship opportunities for students etc.







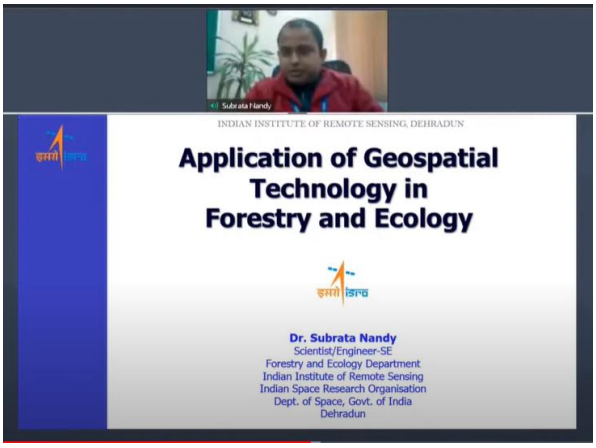
Dr. Subrata Nandy, Scientist/Engineer - SE, Forestry and Ecology Department, ISRO (NRSC-IIRS)

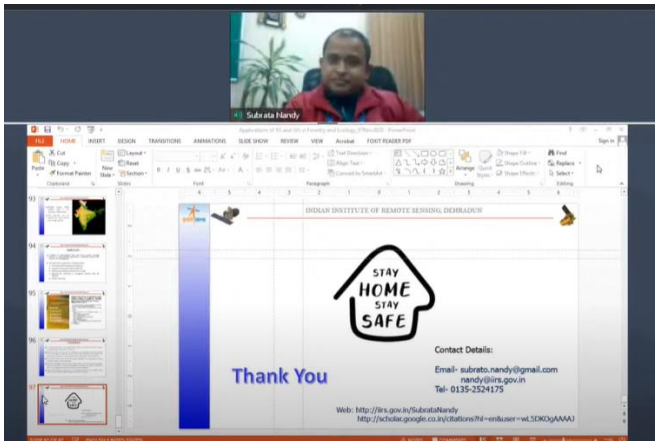
Dr Subrata Nandy's field of expertise in Forest biomass/carbon assessment, Forest ecology, LiDAR remote sensing in forestry, Assessment of CO_2 fluxes and forest productivity, Biodiversity characterization and Wildlife habitat modelling. He is life member of Indian Society of Remote Sensing, Indian Meteorological Society and Indian Society of Geomatics. He has completed M. Sc. and M. Phil in Ecology from Assam University, Silchar, Assam and PG Diploma in RS & GIS Application for Natural Resources Management with specialization in Forestry & Ecology from Indian Institute of Remote Sensing, Dehradun. After completing Ph. D. in Forest Geoinformatics from Forest Research Institute University, Dehradun, Dr. Nandy joined Indian Institute of Remote Sensing, ISRO, Dehradun as a Scientist in 2008. He received the prestigious S K Seth prize for the year 2013 for the best research paper entitled 'Plant richness modelling in south Gujarat using remote sensing and geographic information system' in the field of Environment and ecology published in the Indian Forester. He is a reviewer of several international journals in the field of Remote sensing, Ecology and Environment. He has more than 40 publications in peer reviewed journals to his credit, written chapters in several books and had presented scientific papers in many international seminars/ symposia.

Learnings

Dr. Nandy explained application of geospatial technology in forestry and ecology. He has elucidated the topics of remote sensing, Geographic Information System (GIS) and Global Positioning System (GPS). He introduced freely available satellite data resources includes USGS, esa, bhuvan etc. The basics of image interpretation of satellite data based on geomorphology, ecology and forestry with examples has explained. Plant functional type mapping and their modelling described based on the different variables like seasonality, climate conditions. High and ultra-high-resolution data differentiated with Cartosat 2S data in agriculture fields and defined multi resolution image segmentation. Seasonal changes of forest cover and their monitoring and prediction described using the datasets from Assam region from 1924 to 2009. The recovery of mangrove forest in west coast of Maharashtra during the period of 1998 to 2016; dry and flood seasons of Kaziranga National forest by using Landsat imagery gave as examples of geospatial

application. RS and GIS based multi criteria approach (MCA) used in identification of swamp deer potential habitat, habitat suitability analysis, biodiversity characterization at landscape level using RS and GIS has explained in detail. The mapping of carbon fluxes or forest biomass using remote sensing technology; types and concepts of LiDAR and its applications has described. He clarified the questions of participants at the end of the sessions.





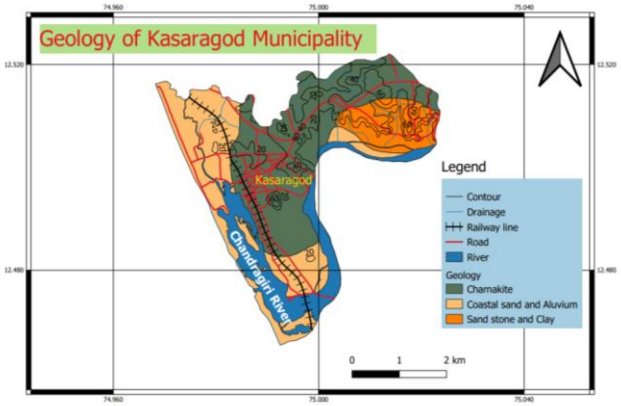
Day 6: 08-11-2020; Sunday at 3:00 p.m. - 6:00 p.m.

QGIS practical is led by Dr Prasun Kumar Gupta, Scientist/Engineer - SD from the Dept. of Geoinformatics, at Indian Institute of Remote Sensing (IIRS), Indian Space Research Organisation (ISRO), Department of Space (DOS), Govt. of India (GOI), Dehradun as the continuation of Day 5 session 1. He has explained each step prior to the hand on practice and clarified all the doubts from participants' side. The recorded classes and project materials made available in Moodle for the reference to do the project assigned to the participants. The step wise instructions for the installation of QGIS, practical data sets and demo files has also shared in Moodle platform. Participants submitted five layers output map created through Moodle based on the instructions given by the resource person. Example of QGIS output has shown below.

Day 6

Gnuplot practical is led by Dr Ajith R., Post Doctoral Research Fellow at Dept. of Physics, Indian Institute of Science Education and Research, Bhopal. His research interests include highly degenerate quantum systems, ultracold matter and dynamics of complex quantum systems, nano optics and plasmonics, frustrated magnets and microwave waveguide engineering. After completing his masters in Physics from Mahathma Gandhi University, Kottayam, Kerala he did his Ph. D. in Central University of Kerala and joined Institute for Basic Science, South Korea as a Post Doctoral Fellow. Dr. Ajith has more than 20 publications in international journals, written 2

chapters in books, presented scientific papers in more than 10 international events and had contributed to 3 conference proceedings. During the session he has explained each step prior to the hand on practice and clarified all the doubts from participants' side. The recorded classes and project materials made available in Moodle for the reference to do the project assigned to the participants. The step wise instructions for the installation of Gnuplot, practical data sets and demo files has also shared in Moodle platform. Participants submitted the plot created through Moodle based on the instructions given by the resource person.



DAY 7

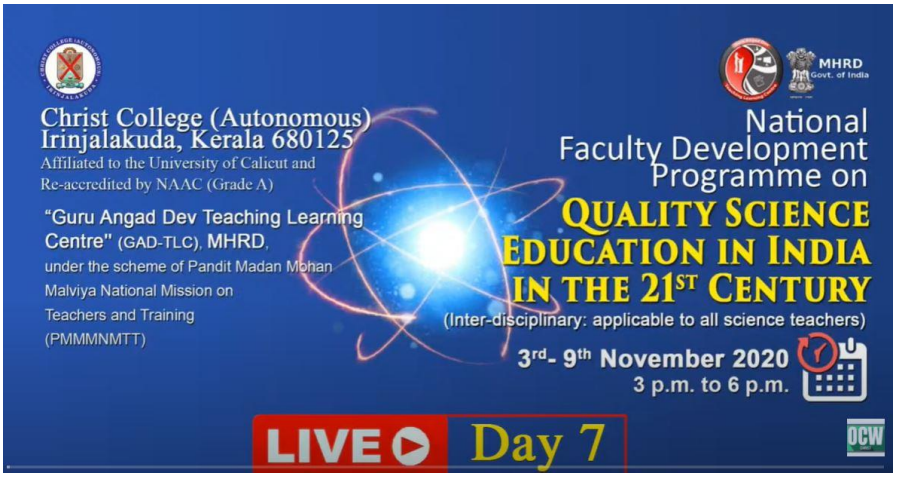
(09-11-2020; Monday) 3:00 to 6:00 p.m.

[3:00-3:10 pm]- Interacting with participants and introducing Dr. S. Lokanathan. Mr. Madhusudan, Asst. Director, Jawaharlal Nehru Planetarium, Bangalore.

[3:10-4:10 pm] – Thinking about Science [Resource Person: Dr. S. LOKANATHAN, Emeritus Fellow, University of Rajasthan]

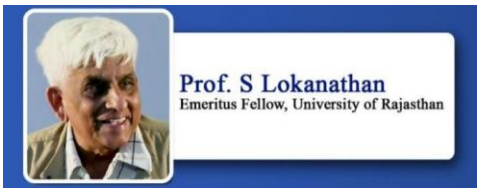
[4:10- 5:00 pm] – Metamaterials and their fascinating applications [Resource Person: Dr.V.P. Joseph, Former Dean of Science, Christ College Autonomous, Kerala]

[5:00- 6:00 pm] – [Valedictory, Assessment and Evaluation]



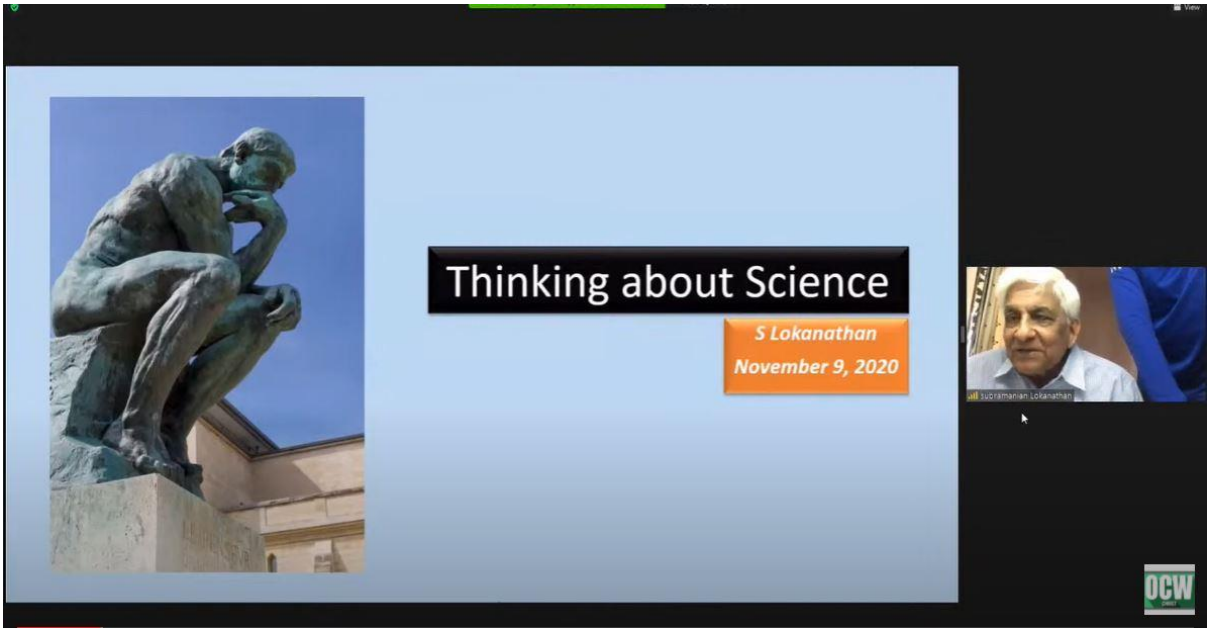
SESSION 1: INVITED LECTURE (3:00 TO 4:00 P.M.)

RESOURCE PERSON:



Professor S Lokanathan obtained his PhD from Columbia University in 1957. Later, he was a research scientist at Oxford University for about 7 years. He worked at various institutes like Delhi IIT, Jodhpur University and University of Rajasthan. He was the Dean of Faculty of Science, University of Rajasthan. He authored hundred research papers in Particle Physics and High energy Nuclear Physics. His lab in Jaipur collaborated in experiments at CERN (Geneva). He is a good teacher who has inspired generations of students to do science in right way. He continues to be a part of an ambitious project of JN Planetarium known as REAP where he shaped many interested students into researchers of International quality.

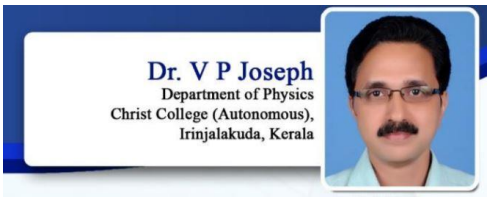
LEARNINGS: Prof. Lokanathan shared his thoughts about science. He started his lecture pointing out the efforts from Galileo to Fizeau in measuring the speed of light. Prof. Lokanathan detailed the contributions of great scientists and shared their views on scientific method of enquiry. He cited the works of Lord Kelvin, Karl popper, Mendel and Fresnel etc. Professor also detailed about the experiments of Fizeau and Michelson-Morley. He summarised how important the science and scientific method is and the need of proper experiments in finding the truth. Participants were very much informed and inspired by the experienced talk of the professor.



TITLE OF TALK: ***'Thinking about Science'***

SESSION 2: INVITED LECTURE (4:00 TO 5:00 P.M.)

RESOURCE PERSON:



Dr. V. P. Joseph was the former Dean of Science and Research coordinator of Christ College, Irinjalakuda. He has completed his PhD on "Radiation characteristics of new hollow dielectric horn antennas' from CUSAT in 2000. His area of specialization is electromagnetic theory, antennas and radiating systems, metamaterials, FDTD analysis, computational electrodynamics etc. Dr. Joseph authored more than 77 research publications and presented 61 research papers at National and International venues. He has completed 3 major research projects and 5 students were awarded PhD under his guidance. He has served as the chairman for the Board of studies in various institutions like St. Thomas College, Vimala College, Christ College etc. He has received the best research publication award a couple of times.

LEARNINGS: Dr. V.P. Joseph delivered a very structured talk on metamaterials in which he first explained what a metamaterial is? after that he ponied out the types of metamaterials like microwave and photonic and then he connected the properties of metamaterials with its applications like radioactive colling, seismic shield, medical imaging, wireless charging etc. Dr.

Joseph detailed about ways of synthesising metamaterials. Finally, he summarised the research done at Christ college regarding metamaterials like dielectric sensors and feather light artificial plasma horn antenna for astronomical and communication applications

TITLE OF TALK: ***'Metamaterials and their fascinating applications'***

SESSSION 3: Valedictory (5:00 TO 6:00 P.M.)

The Valedictory message was given by Dr. M K Jayaraj, Vice-Chancellor of University of Calicut. The audit courses offered by Christ College on Environmental Science and Disaster Management for under graduate students as prescribed by UGC in the online mode was also inaugurated in the function. Dr. M K Jayaraj appreciated the initiative taken by Christ College (Autonomous) to conduct the Faculty Development Program for enhancing the quality of teaching learning process in the higher education sector. Moreover, this was a maiden attempt in conducting a National level FDP under University of Calicut and the Vice-chancellor gave special mention on the efforts put forward by the Christ College (Autonomous) in successfully completing the National FDP and GADTLC for their immense support in the joint venture. The message from the guest of honour was given by Prof. A. K. Bakhshi, Vice Chancellor, PDM University, Haryana and the program evaluation was done by Dr.VIMAL RARH; Project Head and Joint Director, GAD TLC of MOE,GOI. The Vice Principal Dr. Shaju KY welcomed the delegates in the online gathering and Dr. Fr. Jolly Andrews CMI, Principal Christ College delivered the presidential address, Fr. Jacob Nerinjampilly CMI, Manager, and Dr. Robinson PP, IQAC coordinator of Christ College Autonomous felicitated in the valedictory function. The Convenor of the National FDP Dr Linto Alappat proposed the vote of thanks.

Statistical Analysis

Designation of Participants attended	Guest Lecturer	Assistant Professsor	Associate Professor	Professor	Scientific Assistant	Student
	16	169	3	1	1	1

Qualification	Ph.D	PG	UG
	95	96	1

Subject	Physics	Chemistry	Zoology	Mathematics	Botany	Computer Science	Geology & Environmental Science	Statistics	B-Voc	Others
	35	25	27	20	19	13	18	9	5	20

Nature of Institution	College	University	Others
	176	12	3

Nature of Appointment	Permanent	Ad-hoc
	150	41

SESSION WISE FEEDABCK ANALYSIS

DAY 1

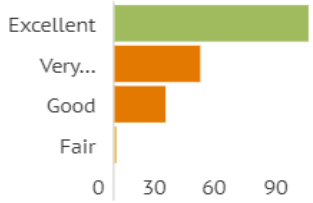
(03-11-2020; Tuesday) 3:00 to 6:00 p.m.

1

How would you rate the effectiveness of the presenter in delivering the presentation?

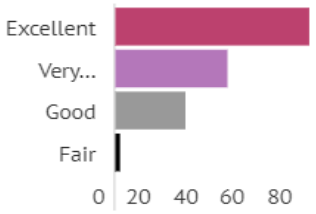
2

How would you rate the speaker's knowledge of the topic?



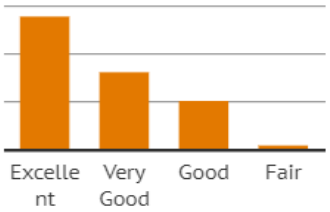
3

How would you rate the scope and depth of the presentation?

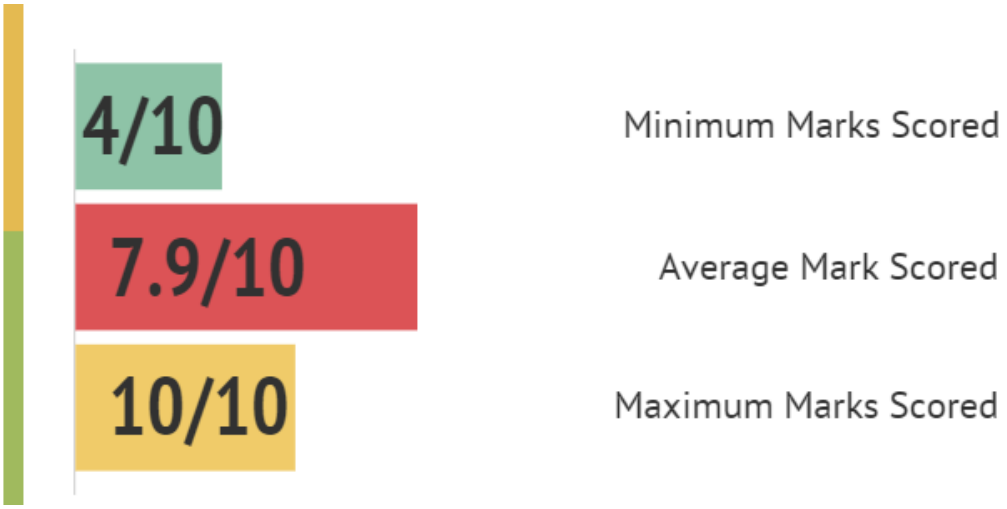


4

Please rate the content of the slides/virtual aids

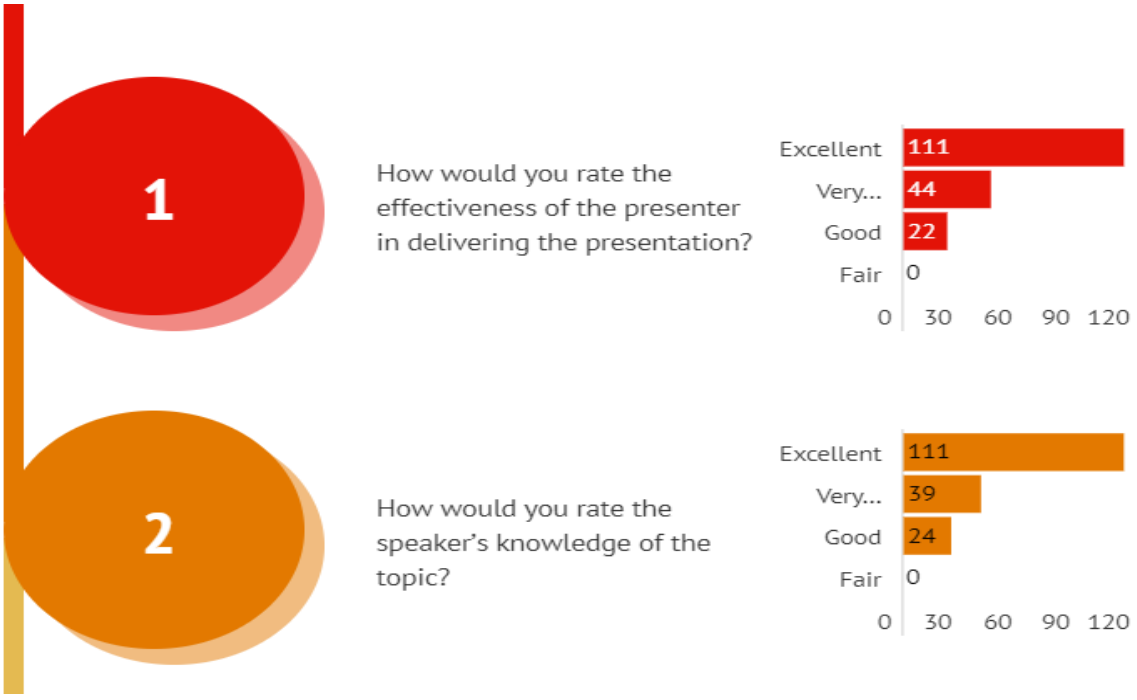


Daily Quiz-Day 1 Statistics



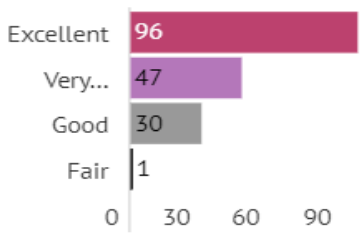
DAY 2

(04-11-2020; Wednesday) 3:00 to 6:00 p.m.



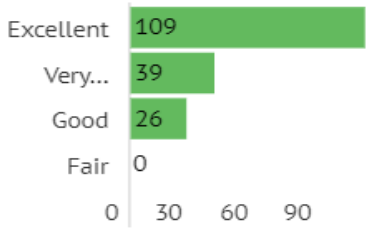
3

How would you rate the scope and depth of the presentation?



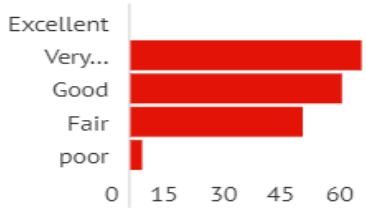
4

Please rate the content of the slides/virtual aids



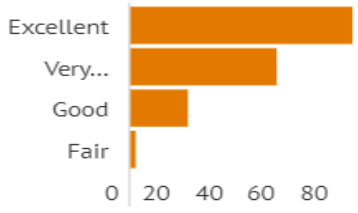
1

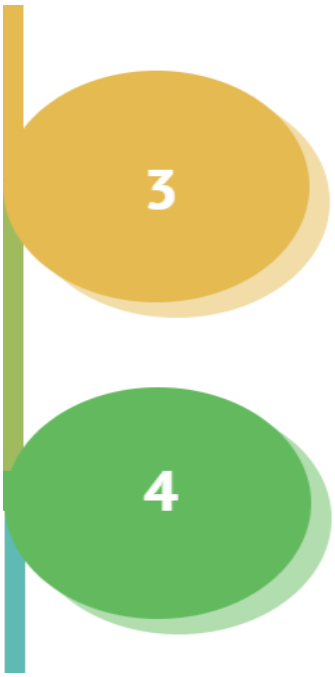
How would you rate the effectiveness of the presenter in delivering the presentation?



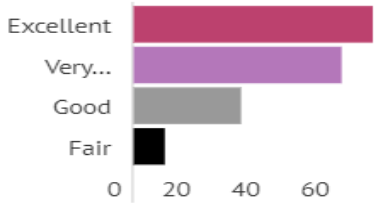
2

How would you rate the speaker's knowledge of the topic?

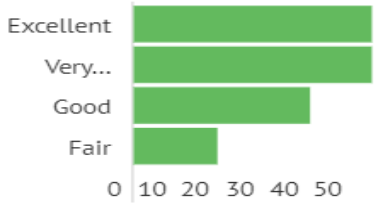




How would you rate the scope and depth of the presentation?



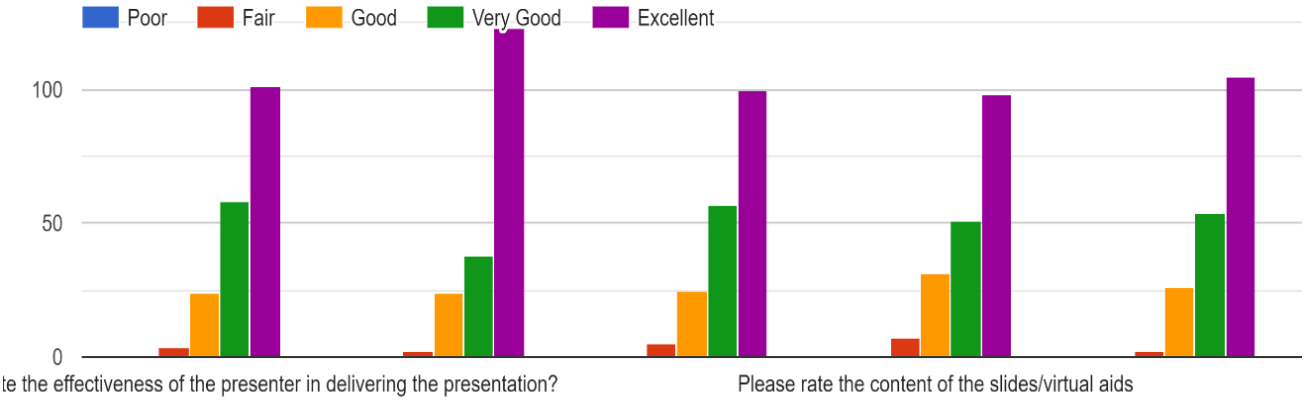
Please rate the content of the slides/virtual aids



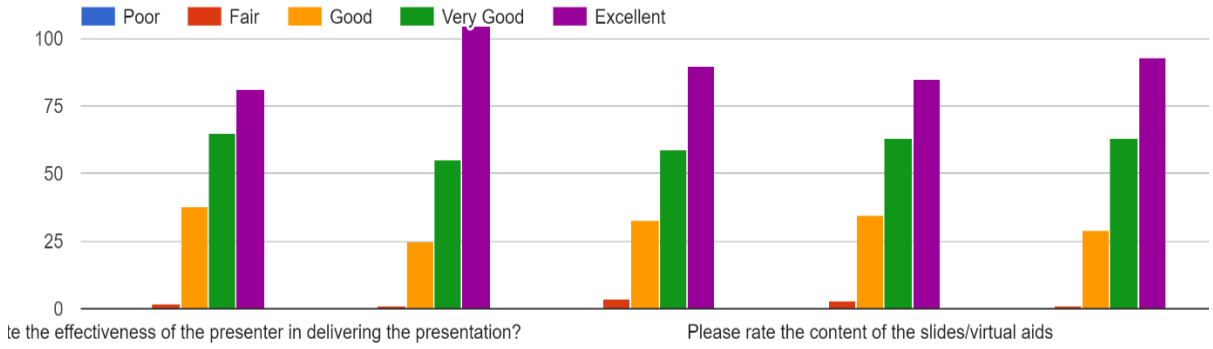
DAY 3

(05-11-2020; Thursday) 3:00 to 6:00 p.m.

Feedback -Prof K MURALIDHAR



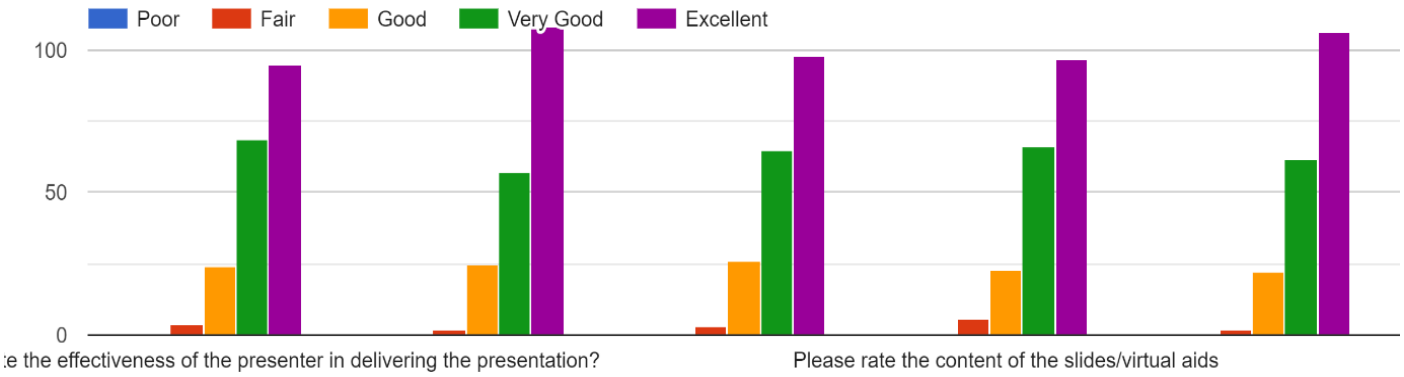
Feedback -Dr Kirpa Ram



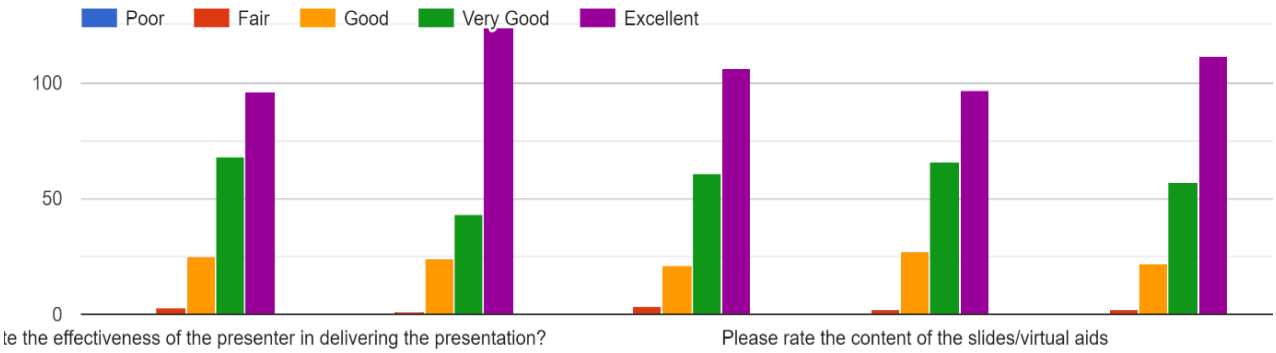
DAY 4

(06-11-2020; Friday) 3:00 to 6:00 p.m.

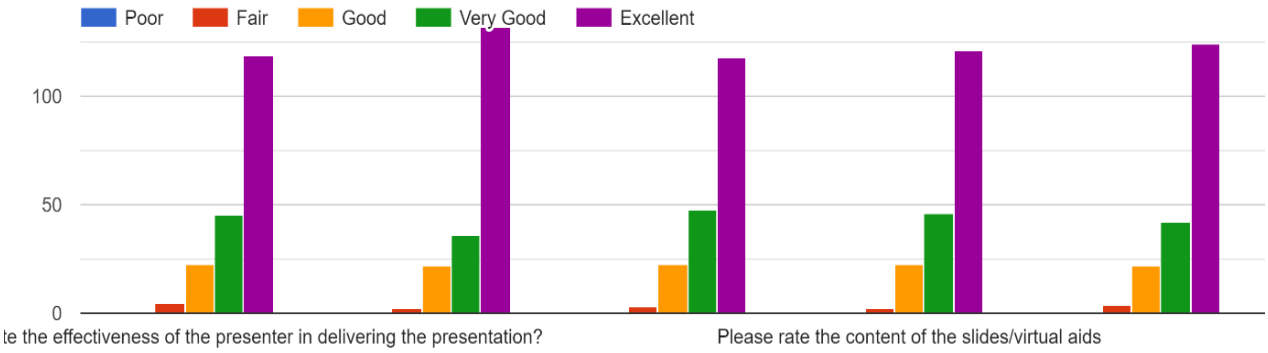
Session 1 -Mr Vinay Kumar



Session II -Dr L . Elango



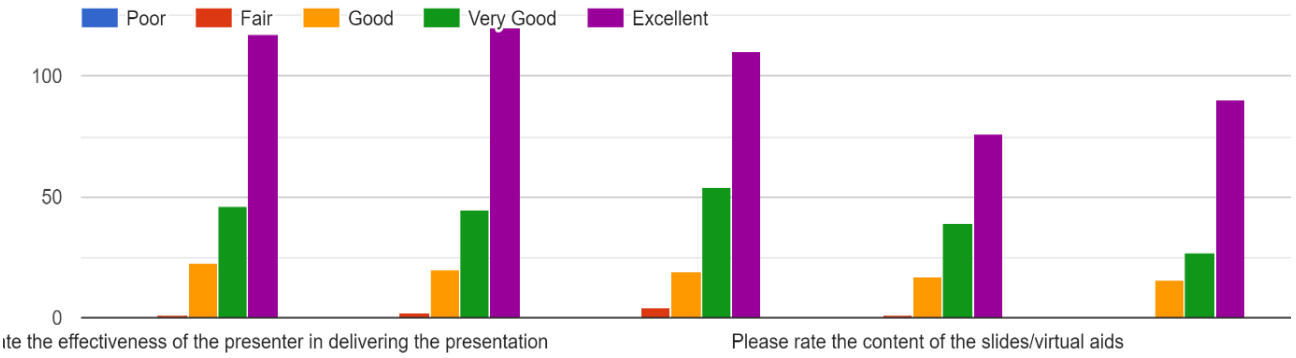
Session III -Dr Vishal Joshi



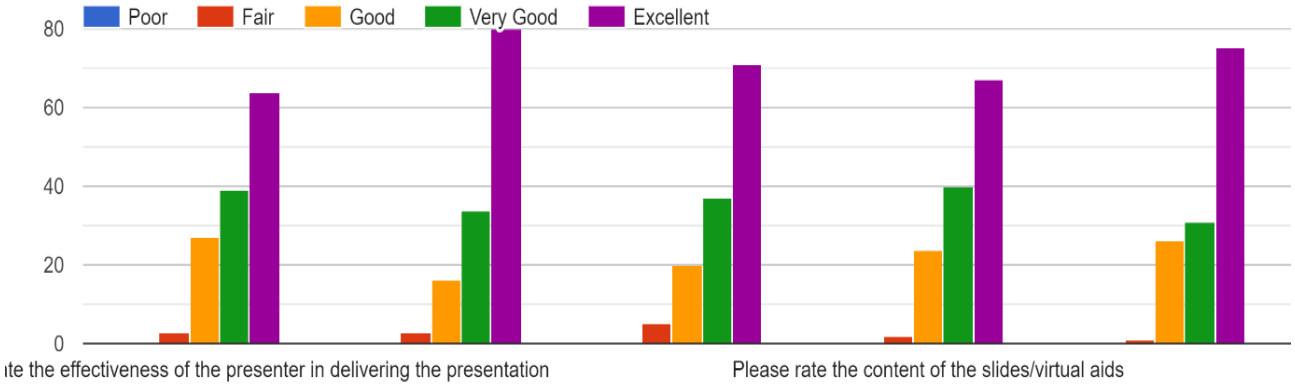
DAY 5

(07-11-2020; Saturday) 3:00 to 6:00 p.m.

Session 1 Feedback-Dr Prasun Kumar Gupta



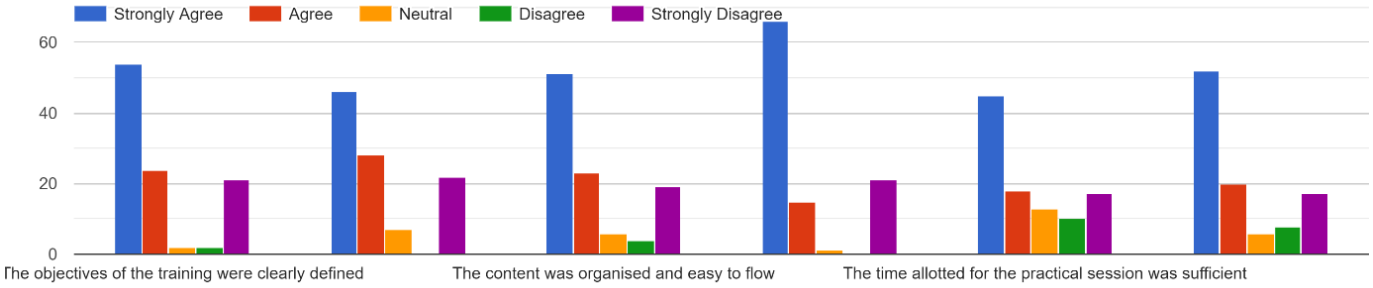
Session II Feedback-Dr Subrata Nandy



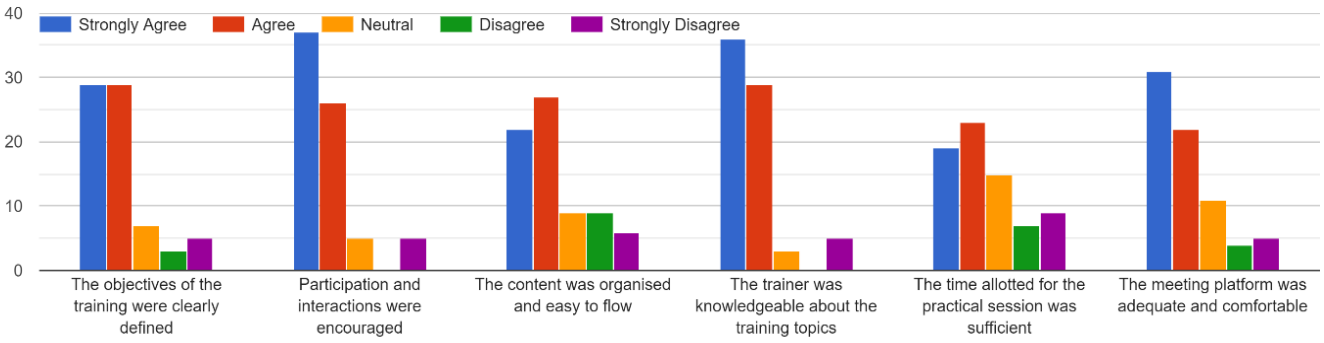
DAY 6

(08-11-2020; Sunday) 3:00 to 6:00 p.m.

Feedback of Practical Session Using OGIS Software-Dr Prasun Kumar Gupta



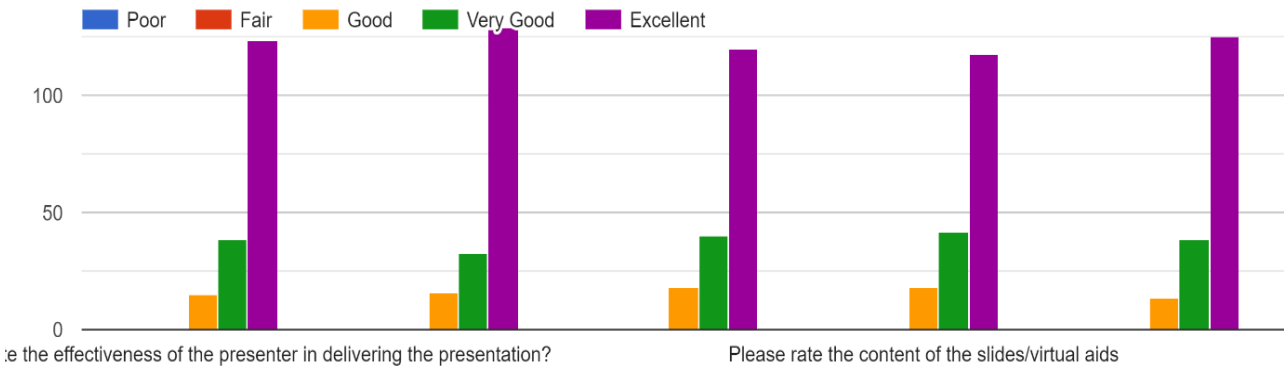
Feedback of Practical Session Using Gnu Plot Software-Dr Ajith



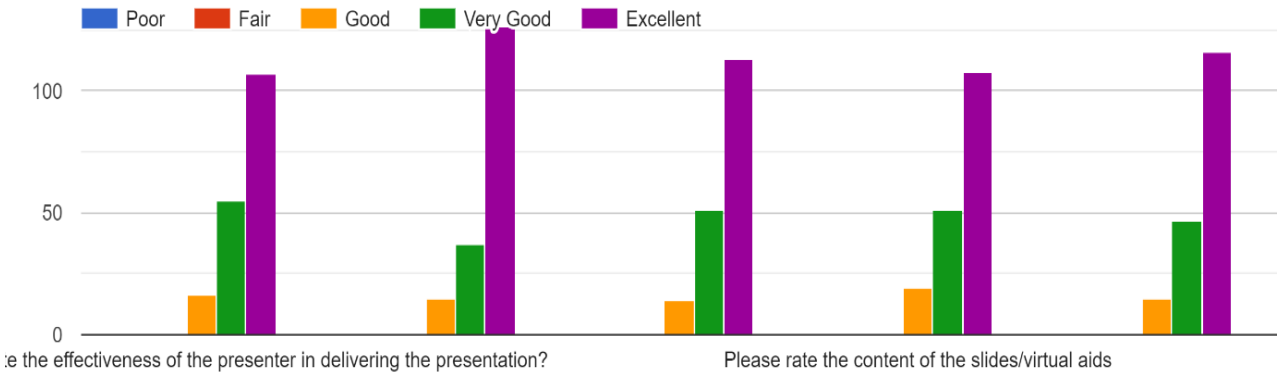
DAY 7

(09-11-2020; Monday) 3:00 to 6:00 p.m.

Session 1 Feedback -Dr S Lokanathan



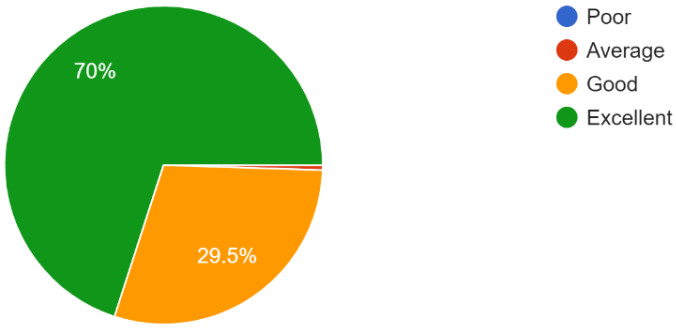
Session II Feedback -Dr V P Joseph



OVERALL FEEDBACK OF THE PROGRAM

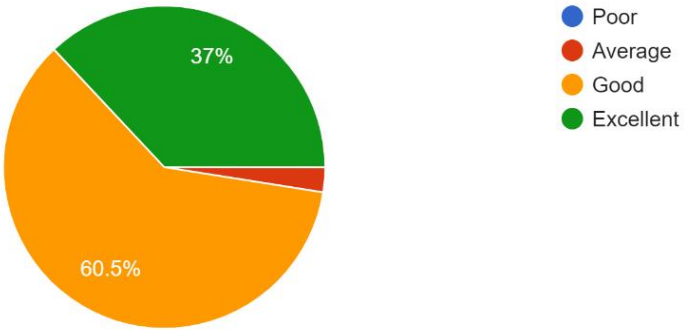
How do you rate this Online FDP(Overall)

200 responses



How do you rate your overall knowledge in the topics covered in this OFDP after attending

200 responses



Do you wish to attend similar FDP's in future

200 responses