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SPECIAL POINTS OF INTEREST:

- Creative Thinking

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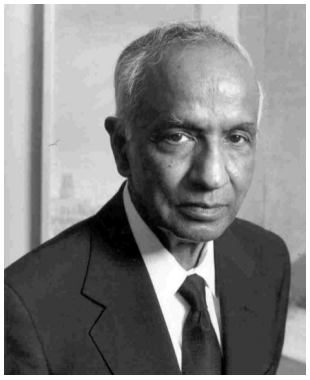
"Every once in a while, a new technology, an old problem, and a big idea turn into an innovation."

- Dean Kamen

Creative Thinking: Reflections from the Life of Dr. Subrahmanyan Chandrasekhar

A brief Introduction to Dr. Subrahmanyan Chandrasekhar



Dr. S. Chandrasekhar, or Chandra as he popularly known among his peers, was born in 1910 in Lahore, in the undivided India. He was one of the foremost scientist of the 20th Century. The Indian-American astrophysicist is remembered for his work which influenced the later developments related to an understanding of stellar objects, white dwarfs, and black holes. He won the Nobel Prize for Physics, shared with William Fowler, in 1983, largely for this early work on the structure and evolution of stars.

He was a child prodigy, who grew up wanting to be a scientist, following in the footsteps of his paternal uncle, C. V. Raman, who was the first Asian to get a Nobel Prize in Physics in 1930. Dr. S. Chandrasekhar was awarded the Padma Vibhushan Medal by the Government of India in 1968.

Early Education, Life and Career

He was homeschooled, before attending Presidency College, Madras, from 1925 to 1930, where he completed his UG in physics. He wrote his first scientific paper titled '*The Compton Scattering and the New Statistics*' when he was in his teens. He contacted Ralph Fowler, an eminent astrophysicist, to forward his paper for publication in the prestigious *Proceedings of the Royal Society* which was published in 1929.

After his graduation, he was awarded a Government of India scholarship to pursue graduate studies at the University of Cambridge, England, where he where he finished his PhD under Professor Ralph Fowler.

At the age of 26, Chandrasekhar was appointed deputy professor at the University of Chicago, where he worked for the rest of his career. He was elected to the Royal Society of London at the age of 34 in 1944. NASA's premier X-ray observatory was also named the Chandra X-ray Observatory in his honour.

His most notable work was on the Chandrasekhar limit. He first worked out the Chandrasekhar limit during his sea voyage from Madras to Cambridge in 1930. While aboard the ship, he did the calculations that formed bulk of the work for which he would later be awarded a Nobel Prize.

His calculations predicted that a white dwarf much heavier than the sun could not exist. The Chandrasekhar limit describes the maximum mass of a stable white dwarf star, or the minimum mass above which a star will ultimately collapse into a neutron star or a black hole. With this theory, Chandrasekhar showed that the mass of a white dwarf could not exceed 1.44 times that of the Sun. It was the first irrefutable mathematical proof that black holes - as they were later dubbed - had to exist. His calculations made people understand about supernovas, neutron stars and black holes, which was identified in 1972.

Dr. Chandra published his findings in the late-1930s, but his discovery was rejected and ignored by the scientific community for decades. In 1932, astrophysicist Milne discouraged Chandra from publishing a paper that would have contradicted Milne's theory (Miller, 2005).

Chandra considered Sir Arthur Eddington, "greatest astrophysicist of his day" (Miller, 2005, p. 329), and the foremost authority on the physics of stars at that time, as his mentor and discussed his findings with him. Eddington approved his work and suggested that he should present his results at a meeting of the Royal Astronomical Society in London. However, in the meeting instead of supporting him, Eddington criticised and ridiculed Dr. Chandra's ideas, methodology. He denounced Chandra's groundbreaking discovery that "might well have transformed and accelerated developments in both physics and astrophysics in the 1930s" (Miller, 2005, p. 150). Prominent scientists such as Niels Bohr, Ralph Fowler, Paul Dirac, Léon Rosenfeld, and Wolfgang Pauli privately acknowledged his discovery, but none contradicted Eddington publicly.

The confrontation had a huge impact on his research, whereby Dr. Chandra stopped further research on the subject of white dwarfs, but moved on to work on different other subjects. However, what is worth mentioning is that Dr. Chandra did not consider the criticism as a personal attack and stayed as a good friend with Sir Arthur Eddington despite their controversy. Chandra also delivered two centenary lectures on Eddington, in 1983, at the Trinity College of Cambridge, titled `Eddington: The Most Distinguished Astrophysicist of His Time'.

An Inspirational Anecdote from his Life

In the late 1930s, at University of Chicago, Dr. Chandrasekhar was scheduled to teach a course in astrophysics at an astronomical observatory which was 80 miles away from the main campus.

Dr. Chandrasekhar was looking forward to it, but only two students registered for Dr. Chandrasekhar's course. In the University, the professors took pride in the popularity of their courses and the number of student registrations for the course. And because of embarrassingly low attendance, Dr. Chandrasekhar's course was ridiculed and made fun of even by his colleagues.

It was felt that Dr. Chandrasekhar would cancel the course, as he had to travel more than 100 miles back-country roads for just two students. But Dr. Chandrasekhar did not cancel the course, as he was fond of the subject and did not want to miss an opportunity to teach and explore the subject in-depth. Since it was a small class, the teacher and the students spent a significant amount of time in discussing and exploring unmarked areas and developing deep knowledge. This was the smallest class in the university. Concerns, if any, about the merit of such a commitment were erased in 1957, when the entire class, comprising both the students, T.D. Lee and C.N. Yang, went on to win the

Nobel Prize in Physics. Later, Dr. Chandrasekhar himself got the Nobel Prize in 1983. Thus, this became the smallest yet most successful university class of all time as everyone in the class had won a Nobel Prize.

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Conceptualization of Innovative Strategies for Quality Inputs for Revision of Programme – Real Experience

Background

School of Health Sciences launched Diploma in Nursing Administration (DNA) Programme in 2006 and 19 Programme Study Centers were established all over India. At present, 12-14 study centers are admitting 200-230 students since 2014-2018. Rationale of the programme is that it will provide basics of administration / management, its principles and application of these principles and concepts in nursing. Administration/ management of nursing services and nursing education institution are an essential component. As there is no approved programme related to administration/management by Indian Nursing Council in regular system therefore IGNOU is offering DNA programme as Continuing Education programme. DNA Programme is approved by IGNOU Statuary Bodies and UGC. As per IGNOU policy, a programme needs to be revised after 5 years to update the syllabi and add new concepts, therefore keeping in view the revision guidelines of university, the Programme Coordinators undertook the revision of the programme.

Process of Feedback

In 2014, feedback proforma was developed for PIC and Academic Counsellors, Learners, Hospital Administrators and Experts; main areas for feedback were regarding implementation and delivery of the programme, problems faced by students, Academic Counsellors during theory and practical sessions, theory and practical content, areas to be added or deleted, organization of Blocks and Units, attending IRC and teleconference sessions, programme guide and academic counsellor manual format and use etc. Experts in hospitals and management institutes were contacted for latest content, concepts in management and guidelines implemented in hospitals etc. Feedback format was mailed and sent by post thorough in 2014-15. Feedback form was also mailed to Regional Centers through RSD for feedback from PICs/ACs. By the end of 2017, after repeated reminders it was possible to get feedback from 3 PICs and 10 Academic Counsellors only. 30 learners provided the feedback and feedback from 12 medical and nursing administrators was collected informally and formally. In 2017-2018 student data was collected from student registration division and feedback was collected from Delhi PSC and other PSCs through what's App from nearly 150 students. Expenditure of budget on various activities of DNA programme was also collected from

regional centre and it was reviewed. There were no financial implications on university as ICT was used to collect feedback except for speed post to 200 students at initial stage.

Monitoring and Learner Support

Monitoring format was used for monitoring DNA programme. The basic components of the format were number of theory and practical sessions, schedule, number of academic counsellors, coverage of units during specific days and number of students present, etc. In 2015-2018 monitoring was carried out through phone and e mail and in 2017 and 2018 with the establishment of new PSC at Delhi, monitoring was carried out through personal visits, e mail and social media. Most of the students provided feedback but it was difficult to get feedback from PIC and Academic Counsellors except for 2-3 study centres.

Admission data for 4 years was collected from Student Registration Division and analysed and in 2017-2018 social media was used to interact with the students. Learner support in 2017 and 2018 was provided through WhatsApp groups. Students shared their concerns and discussed academic issues. Programme Coordinator at HQ shared additional material to students as few concepts were not updates or discussed in brief in blocks. IGNOU teleconference sessions links were shared with students.

Many students had not received material or received late therefore egyankosh link was shared. Few students had problem in downloading material therefore zip file of material was shared so that they can complete assignments and read blocks during academic counselling. Various other links were also shared. Audio books were recorded on various aspects and send to students to clarify their doubts and give additional material for their comprehension. Learner support through social media was available 24x7; accessible and student friendly; students came out with their problems, doubts, and shared material with each other; programme coordinator was able to analyze the difficult areas, their problems and some of the academic counsellors also shared their experiences.

Learner Feedback provided a vision regarding background of students, level of understanding about administration principles and their application in real situations, areas to be updated and strengthened. Feedback also provided vision to identify areas which students can learn independently like communication, group and group dynamics, health services in India, etc; areas like hospital and personal policies, rotation plan etc where little support is required; and areas which require to be discussed in detail like purchase procedure, analysis of performance appraisal, disciplinary committee meetings, store management in hospital, etc. Feedback and monitoring provided the difficult areas and areas which required strengthening; identified difficult areas during evaluation of term end examination answer script; and while going through the units during teleconference and academic counselling.

Summary of Feedback and Monitoring 2014-2017

Main problems and suggestions by PICs and Academic Counsellors are:

- Orientation of the programme at PSC is essential as they are facing problems in implementing the programme and administrative aspects.
- List of students and material to PSC should be provided in the beginning of the session by mid of January.
- Assignments are copied by students therefore need to modify the assignments.

- Content needs to be more interesting by adding case studies.
- Self and supervised activities need to be modified.
- Theory material needs to be reviewed as repetition of content in various units.
- Printed material i.e. blocks should be provided to academic counsellors in advance.
- Students are not interested to attend teleconference and radio counselling sessions due to shift duties.
- Practical examination should be university examination.

Main problems faced and suggestions by students

- Existing material needs modification and revision.
- Blocks should be more interactive and more examples from hospitals should be given.
- Academic Counsellors should take lecturer cum discussion sessions as subject is new.
- It is difficult for them to attend teleconference or radio counselling as they are working.
- Theory contact sessions can be modified with presentations, social media discussion and sharing of material, which was very useful in one study center.
- Difficult to get leave for contact sessions and practical activities.
- Theory if possible can be online or through teleconference, nearly 50 percent agreed for contact sessions.
- Assignments need to be more interesting.
- Practical sessions and activities needs to be more interesting and more administrative activities needs to be added. Visit report can also be included. Purchase, audit, finance, human resource management can be explained in detail with examples from real situations.

Suggestions by Medical and Nursing Administrators

- Existing material needs modification with new concepts.
- Add case studies from hospitals and community setting.
- If possible theory can be through online platform / teleconference so that students do not face leave problem.
- Practical activities need to be modified and visit reports; observation reports to various departments can be added or some small project can be included or workshop can be organized.
- Management (General) and Hospital Administrators should be involved in course writing as practical scenarios are missing.

Suggestions by Programme Coordinators

- Existing material needs modification and re-organization. New concepts need to be added with examples. Case studies from hospitals, community administration and educational institutions needs to be added. Theory blocks repetition needs to be removed and concepts needs to be explained with examples from hospital. Basic management concepts and principles need strengthening.
- Programme guide and academic counsellor manual need revision.
- Feasibility of conducting theory sessions through teleconference / online platform / MOOCS can be tested as students face problems for getting leave.

- Practical activities need modification as more administration activities based on policies real scenarios in hospital and job responsibilities including new trends needs to be added. Log books for practical activities needs to be added.
- Practical examination should be university examination.
- Formal feedback of experts on theory and practical components can be taken by inviting experts from hospitals, nursing and management institutes.
- If possible innovative teaching learning methods can be integrated so that learners are motivated to learn and ICT can be used for theory sessions. As it is difficult for students to get leave.

Revision of the Programme - Steps for planning meeting

Keeping in view the need for nursing administrators in the health institutions and to strengthen their knowledge and skills in management, it is important to review and revise the programme. As per IGNOU revision guidelines it is important to maintain quality of courses and update/revise courses over time for academic credibility. Following the revision procedure as per the revision policy which was approved by the 62nd Academic Council, it was planned to organize Expert Committee Meeting for the revision of DNA programme. It was important to plan and organize meeting in an effective way so that maximum inputs can be given by experts. Therefore meeting was planned in advance and it took nearly 2 months to review the new concepts using library, internet, discussion with experts etc.

Latest material, curriculum of various universities was reviewed in library and online. Existing DNA programme curriculum was also compiled in first column in the format. Programme coordinator/s suggestions were compiled in second column in the format and were reviewed twice. Experts were invited from multidisciplinary areas i.e. nursing, medical, management, distance education; experts working in management college, nursing teaching institutions, nurses working in hospital and public health area; doctors from teaching institutions and hospitals; experts from MOHFW, GOI, Delhi Government, Nursing Council and Nursing Association were also invited. The programme schedule, objectives, status and feedback report, existing and suggested curriculum etc were send to all experts. It was possible to get feedback for basic requirements, theory courses, areas of practical activities, areas for gyan darshan and audio-video. Experts suggested for integration of theory and practical and in possible to have common platform for all activities so that student can have easy access. Note taking and discussion was very systematic and easy as planned formats were followed by all experts.

Advance planning in a creative and innovative ways helps to achieve objectives. Advance schedule and background papers to experts assure that they will have enough time to contribute and time management is the crux of achieving objectives. In case we provide no background work and give plain paper, experts will scribble points but if background material is workout and details are provided in advance experts will give inputs which are helpful for revision of the programme. Revision is an ongoing process which requires in-depth process which has profound long term consequences for students, institutions and university. Therefore ownership and quality of work is crux of revision and provided an opportunity for innovation and creativity.

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The National Centre for Innovation in Distance Education (NCIDE) was established in December 2005. It is a facility for promoting, supporting, re-engineering and disseminating innovations in Open and Distance Learning (ODL) system. The NCIDE is a ground for nurturing bright and inquisitive minds whose ideas and explorations are expected to revolutionise the ODL system to suit the needs of Gennext. The Centre's goal is to develop a culture of continued search for new and innovative solutions to offer seamless education for all, achieve cost efficiency in its operations and provide borderless access to quality education and training.

We look forward to receiving your suggestions for this e-newsletter. We also welcome your contributions for the future issues. Please send us