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Connecting Thinkers…

Editors' Message

Hello Readers and welcome to the seventh issue of Thinklet. We have reached the half mark of this year and as it usually is, many of us would have lost focus of our New Year Resolutions, and other personal goals we would have set for ourselves at the beginning of the year. Some of us may not have made any resolutions looking back at the previous years' record. Let me assure you, it's never too late to start… or start again! In our research journeys, we hear many statements such as "It's too late now, you can't go back and change this", or "If you re-do it now, you are going to lose time" or "You should have thought of this earlier". But, what if we tell you (and we are sure all of you would have realised it by now), research is a continuous process where you learn new methods and techniques every day, discover things in the course of the routine, and constantly reorganise your thoughts and ideas in order to achieve your goal. In all of this, time is a crucial factor, (sometimes acting as a deterrent in allowing you to experiment new things) and sticking to the status quo becomes much easier and requires less effort. But the truth is, if we want to excel, we have to push ourselves, we need to make time for things which are important to us such as our family, our research and our personal goals, because if we do not make the effort, no one else will. The idea behind making new year's resolutions is to set a goal and remain focussed on it and as they say 'Well Begun is Half Done'. But we hope that instead of fretting over the past six months, start again! Start Today! Because there is an equally popular saying 'All's Well that Ends Well'. So here's wishing you Good Luck for a new beginning.

Inside the Issue

Dean's Column
Crafting a Research Paper for Publication: Avoid Nuances of Rejections

Publishing papers is a part of a researcher's contribution. While crafting a research paper with clear thinking is a challenge, there are ways on how a research paper can be a better experience. Here are ten ways to strike it right:

Review Process: Understand the scope of the journal. Rejections happen because of manuscript- journal mission mismatch. This may include the style of presentation, length (word count), critical review points, results found, citation and the referencing.

Have Focus and Direction: Clarify the purpose of the paper. Is it a Research paper, a technical paper, a Conceptual paper, a Case study, Literature review, Commentary, or a general paper?

Title matters: Crafting the title of the paper will draw the attention of a larger audience. Avoid jargons in the title.

Abstract: Write the statement of purpose-; since the abstract is a succinct summary of the entire document. In next 20-30 lines of the abstract, describe the methodology. The abstract should also carry the implications of the results. End the abstract with the value- what is new in the paper and whom is it benefitting?

Introduction: Open with a strong point: surprise the readers. State the relevant numbers, references of well known researchers in the study and try to correlate your ideas with theirs. Have headings and sub- headings. Study twelve to fifteen of the best journals across the globe related to your subject. Identify the gaps found there and address them in your paper. Communicate how your study can be translated into action and can be tested in the real world.

Methodology: Define, describe, and discuss how unique your methodology is. Describe the sampling format followed, the statistical tools used.

Implications: How will the results from the research work impact business, enterprise, or the scientific world? What structural and Organizational changes should be made as a result of your work? Is there an economic or a commercial impact as a result of your work? Focus on societal impact of academic research and throw light on the possibilities of further work in the area.

Manuscript Requirements: Do check the guideline for format, font, tables, graphs, word count, title requirements, acknowledgement, headings, end notes, footnotes, referencing style, use of Roman or Arabic numerical, the copyright, wherever possible.

Get Internal Pre Review: Have an internal review edit from your respective colleagues or someone with a similar research background. Rid your paper of any grammatical errors and follow it up with a plagiarism check. If required, provide a strong cover letter, communicating your intention.

Last Word: Your paper should introduce a novel perspective to an existing problem; and, at the same time, provide detailed ideas for further research. State the limitations of the work and levels of interventions adopted.

There is no Cookie-Cutter template. What matters is that the paper should change our understanding and provide for a fresh outlook. Many a times, publications face rejections. "***Don't Panic, remember- Sholay movie did not run for the first ninety days of the release; the rest is History".***

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Indian Regional Navigation Satellite System (IRNSS)

Under a Memorandum of Understanding with the Space Applications Centre (SAC)/ISRO, Ahmedabad, Jain University has obtained an Indian Regional Navigation Satellite System (IRNSS) Receiver from SAC which has been installed in the School of Engineering and Technology (SET), Global Campus. Systematic and routine measurements are being conducted in and around the Campus towards the receiver characterization and other applications. IRNSS is an independent navigation satellite system being developed by India, designed to provide accurate position information to users in India as well as the region extending up to 1500 km beyond its boundary which is its primary service area, with an accuracy of better than 20 m. It consists of seven satellites, three in geostationary orbit and four in inclined geo-synchronous orbit. The ground segment provides navigation parameters, satellite control and ranging.

IRNSS is an independent navigation satellite system being developed by India, designed to provide accurate position information to users in India

Currently four satellites: IRNSS-1A, -B, -C and –D are already launched and the data are being used for various applications. The receiver can be used in navigation, geographic data collection, GIS applications, scientific research, geodynamics, business solutions, military applications, etc. The standard usages are: (1) IRNSS Signal Monitoring by PVT (Position, velocity and time) Analysis (2) Interference Studies (3) Multi-path Studies (4) Performance of receiver in Dynamic Environment (5) Performance of receiver in Urban Environment (6) Scintillation Studies (7) Space Weather Study (8) Performance of Receiver in jamming/spoofing environment. The Advanced usages are: Differential IRNSS (Similar to D-GPS) and Software Defined Radio (SDR) - based receiver

At present, students, research scholars and faculty of Jain University are actively involved in the field measurements and analysis of data obtained in campaign modes on mission-specific themes such as mapping, space weather, interference studies and so on.

Dr. Raju Garudachar
Research Guide
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Challenges of Combining Teaching and Research

Teaching and researching are two interesting tasks, which run parallel to each other. They overlap and compliment each other in a way neither can survive without the existence of the other. A good teacher can become a great researcher and a great researcher can do the same job as a good teacher.

The importance of research in teaching is that, research leads to professional development and results in continuous learning. Incorporating research into teaching results in increased student engagement and deeper understanding through inquiry-led learning. It also provides students with additional skills such as critical enquiry, evaluation of knowledge and continuous innovation by way of knowledge transfer. First and foremost, it is important to set quality time for research, teaching and yourself. Secondly, it is important to implement the learning from the research ideas at the time of imparting knowledge during teaching. As an academician, being a veteran in the subject, the benefit of having an edge in research will help them to break down the argument and present the knowledge logically and convincingly.

As academicians, there is over reliance on the syllabus, and books pertaining only to the syllabus are passed on to the learners. In addition, there are administrative duties such as assessments which are part of the role.

It is therefore vital to stress the importance of research amongst students to do thorough research and give credit for original and/or industrious research. If incorporated with care, research itself will become a pedagogical tool in class. Thirdly, the most important aspect is that, once the research work is completed, it should be published as it will bring recognition to the researcher. Finally to summarise, being a researcher exposes you to the advanced ideas and knowledge and being a teacher will expose you to learners who will be using your knowledge in the years to come.

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Role of Mathematical Modeling in Operations Research and Ecology/Epidemiology

Over the recent decades, a class of nature inspired has gained attention of the researchers, because they show good characteristic in solving some difficult optimization problems. The class of algorithms includes genetic algorithms, particle swarm optimization, Artificial Neural networks, Ant colony systems, Firefly algorithms and many other evolutionary algorithms which are the abstraction and simulation of natural evolution process from different aspects. However, none of these algorithms can entirely describe the actual process of evolution, but they are very successful in solving some of the very difficult optimization problems. The simulation of natural evolution process is capable of producing good computer algorithms. Optimization algorithms in both the categories, deterministic and heuristic methods, are subject of further improvement to more efficiently locate the global optimum of nonlinear multi modal problems. While modeling the real time scenarios, non-linear problems are encountered quite often and hence attract a large amount of importance because of their complex nature. Presently, the focus is on modeling biological systems with both ordinary as well as partial differential equations, beginning with the nutrient-toxin effect on simple systems, the two species systems are extended to three species to study the flow of toxins from its direct consumer to the subsequent consumers. To study the complexity of these systems, spacio-temporal analysis using Partial Differential Equations are carried out to determine the spatial distribution of biomass over time.

Mathematical Biology gains its importance from the use of quantitative description of a biological system to simulate its behavior which may otherwise not be evident from experiments

Achievements at Jain University:

- Best paper *("Comparative Study of Some Non-Linear Optimization Problems using Heuristic Approaches")* award to Vishal Patil at National Conference on Applied Science and Humanities(NCASH2015) on 5th May 2015. Co-authors: Radha Gupta and Umme Maria
- Best paper award to Vishal Patil at Second International Conference on Recent Advances in Science and Engineering (ICRASE 2015), held at Bengaluru on 9th & 10th May 2015. *"Application of Heuristic approaches by comparative study of some benchmark problems"*, Co-authors: Radha Gupta Umme Maria
- *Publications:* Combined Effects Of Acid And Metal On The Survival Of Resource Based Population Incorporating Nutrient Recycling: A Mathematical Model, International Journal of Applied Engineering Research (IJAER) Asha Bharathi A.T, Anita Chaturvedi, Radha Gupta and Kokila Ramesh.

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Digital Privacy & Identity - Where Are We Heading Towards?

Digital Identity management has become more relevant than ever before in this era driven by information exchange.

Advent of cloud computing has created a paradigm shift in how people communicate and do business. People have embraced the era of information technology, and it has become an essential part of everyday life. However, the facilities provided by Facebook and others come with few potential concerns. User's online activity and their accounts created on websites form their digital identity. There are chances of one's digital identity being stolen by use of personally identifiable information. Identity theft resulting from data/privacy breach is a serious cause of concern for any person/organization. Clearly defined, unambiguous, technically correct legislations can ensure digital privacy. Current legislations are lacking in this regard. Some of the attempts such as "Right to be forgotten" are absurd to say the least. Most countries don't even have well defined privacy and data protection laws. As cloud security researchers, we have a relentless responsibility.

We need to assist governments to identify loopholes in their privacy policies and help them frame it well. There is a need for comprehensive privacy & identity centric approach for solving the challenges. Privacy preserving social networking, health care, e-commerce are some of the areas that we can direct our R&D on. There is a chance for us to lead and dominate in a segment of market which is currently non-existing – 'The Digital Privacy Advocate of the World'.

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R&D in Educational Institution

Progress in human history has been based on **Discovery and Innovation**. Nations that have advanced more than others have shown better Environment and Institutionalisation of "Discovery and Innovation". Discovery & Innovation is fuelled by **enquiry and urge to improve**. **The spirit of enquiry** is inherent in human mind but it is very often dormant or suppressed by immersion in routines of life. It is often limited to currently available knowledge and is not directed to **"future knowledge". The urge to improve** is also natural to humans but again it is lost on one hand by tendency to slide into status quo and by inadequacy of **environment of motivation**. Therefore if India has to accelerate its progress, it has to **create Environment and Institutionalisation of "Discovery & Innovation".** It has to trigger the spirit of enquiry by creating opportunities to break from of routines. It has to liberate "urge to improve" from slumber of status quo on one hand and create an environment of motivation for improvement and Innovation. An Educational Institution is one of the best places to trigger the spirit of enquiry, fuel the "urge to improve" and create a sustained environment of Innovation.

Why? The reasons are :

- Young minds (absorbing current knowledge - **spirit of enquiry**)
- Ideal for push into **"Future knowledge"**
- Faculties, Facilities and Freedom to think out of box
- Easier to create **"Breaks from Routines"**

But these factors alone are not enough to promote effective / significant Research & Development. They only represent basic pre-requisites.
The other key requisites in an Educational Institution to build on these pre-requisites to promote effective and sustained R&D are:

- Establishment of culture of R&D
- Institutionalisation of R&D
- Motivation for R&D
- Funding of R&D
- Collaborative structure and initiatives

Culture of R&D
There are many ways in which a Culture of R&D can be established. Some of them are :

- Establish a suitable R&D Mentor for each discipline: R&D Mentor is usually a faculty (preferably PHD) who has done research in life and has the right skills for facilitating group dynamics. His role is to motivate the group to come out with new ideas for Research, Development and Innovation. He should facilitate creation of an environment of enquiry, urge for improvement and help the group to break from routines and trigger out of box thinking.
- Create "white space" groups. "White space groups" are select group of students with inclination for Enquiry, Discovery and Urge to improve who are given a fixed time (say two hours every week) to brainstorm, create ideas for subsequent R&D work. R&D Mentor will play a key role in facilitating, triggering and motivating the "White space Groups".

Some of the ways in which R&D Mentor can do this : (1) Invite good and forward looking NGOs (working in urban and rural environments) to talk about what solutions they are seeking for problems they are facing or trying to resolve. (2) Invite Industry Executives to talk about R&D projects they are pursuing or where and how they have succeeded. (3) Invite Industry Executives to give talks on key rapid growth areas in terms of Technology. (4) Invite key persons from Institutions which are pursuing R&D projects and / or how they have succeeded. (5) Show inspiring films on Discovery, Innovation, Inventions and Product Development.   Corporates, Industries, NGOs, Businesses, Civil Society groups are replete with successful examples. (6) Invite civil society groups to talk about research work, problems and solutions they are looking for.

Objective of "White Space Groups" should be to zero in on a few R&D projects with clear definitions of objective /end goals, resources required, collaborative partners and target time spans.

R&D in Educational Institution

NO TARGET - NO RESULTS

Institutionalisation of R&D in an Educational Institution

R&D activities and campaign has to be institutionalized in order for them to be sustainable, motivational and visible. Random initiatives here and there will not yield desired results and likely to fritter away well intentioned efforts and energy.

Ideally an Educational Institution should have the following structure: An Apex R&D Council (with some members from the Institution and some carefully selected members from outside). Its role is to drive R&D culture, create and sustain motivation amongst Faculties, Students, Researchers / Research guides, help the educational framework to break from routines.

The Head of R&D Council should be from outside the Institution. This will help the Council to think outside the "boxed in" framework of an Institution and its routines. Apex R&D Council can have a few small sub-committees e.g. for Engineering/Technology, Health / Pharma / Biotechnology, IT / Communication / Electronics, Aerospace / Defence, Societal Research and so on. The key here is to focus initially on a few disciplines and visibly succeed. (1) Its role is to support efforts to get R&D funds, govern and allocate R&D funds. (2) Its role is to facilitate Implementation / Commercialisation of R&D outcomes. (3) Its role is to actively support Collaborations, Collaborative structure and initiatives.

Motivation for R&D

Here again there are many ways.   Some of them are:

- *Motivation of Faculties*:
  Reward and Recognition Policies ; financial encouragement to lead R&D projects and present the outcomes in Conferences, Journals, Visits to Institutions that are successfully doing R&D; Collaborative R&D.

- *Motivation of Students*:
  Reward and Recognition Policies; participation in R&D / Innovation competitions instituted / funded by Corporates as well as, Foundations and Governments; visits to Institutions / Industries and select NGOs; Talks by successful innovators; Certificates for successful work done which can help them in their job search / selection.

- *Motivation for Management team members of Institution* :
  Set targets for R&D successes as judged by R&D Council; Recognition and Reward Policies; Visits to Educational Institutions who have excelled in successful R&D / Innovation.

 Funding of R&D: Without adequate funding, R&D will go no where.

- *Core Funding*: The Institution must set aside a certain sum for Core Funding. This will go towards meeting expenses for the steps and initiative mentioned- Creating Culture of R&D, Institutionalisation of R&D, Motivation for R&D.

- *Project based R&D* : For each project selected for R&D, a suitable funding mechanism should be in place along with targets, milestones and stagegates. Self funded R&D Projects, R&D Projects funded fully by others and Co-funded R&D Projects - those that are partly funded by Institutions and partly by others.

R&D in Educational Institution

Collaborative Structures and Initiatives:

R&D should not be and cannot be successfully done in isolation within Educational Institution.

It is essential that collaborative structures / arrangements and initiatives are put in place.

Examples of such collaborative structures :

- Industry – Academic Collaboration
- Institution to Institution Collaboration
- Govt. to Institution Collaboration
- NGO & Institution Collaboration
- International Collaborations
- Collaboration with civil society groups
- Collaboration with R&D Funding groups / bodies

Finally, the "DNA" of the Educational Institution must undergo a massive mindset change. It has to start and be nurtured from the very top. It is not easy; it is not quick fix. It is a journey. It is much more than "ticking the box". It is more than just intra-institution mechanisms. It is intense desire to enquire, to discover, to improve, to innovate and to excel.

Mr A.K.Vora
Director, Tata Engineering Services
and Member of the Academic Council of Jain University

"Many of life's failures are experienced by people who did not realize how close they were to success when they gave up."
- Thomas Edison
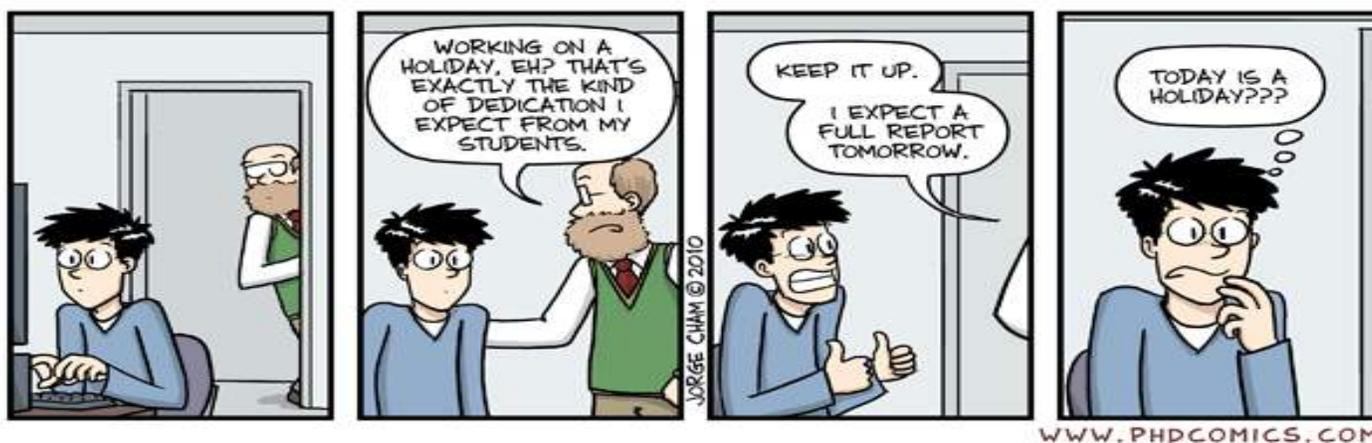
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