ThinkLEt

Connecting Thinkers...

Editors' Message

***Dear Thinkers*,**

In earlier issues of THINKLET we have dealt with many issues which are important aspects of our research-journey. Right from framing the research question to review of literature, data collection and review, choosing the right statistical tools, writing research papers for journals and so on. Behind all these aspects the most critical, underlying skill lies in the 'writing' part of the research work, especially when one is drafting a thesis/ dissertation. Of late, we have found severe challenges in this particular area which may not be directly dealing with our research work but without which our work is incomplete!! It is an undisputed fact that writing, as a tool used to communicate our ideas, is a complex and challenging activity. Much of the research writing is today not done in our mother tongue but in the English language. Though most of us do speak English with fluency, being our second language, there are often challenges in writing it correctly. Many a time, researchers express a great deal of frustration when their guides keep sending them back written material to make major corrections not so much in the technical details but with the grammar and language aspects. Research scholars, especially from the Sciences and Engineering do not feel it very important to pay attention to this aspect of research, because their work and results speak for themselves.

However, grammatical errors shift the attention from the technical aspects of our work to the expression aspect of the work. The quality of the thesis deteriorates due to these language errors. Most commonly we find the wrong use of articles, punctuation marks, structure-based mistakes, limited vocabulary, disjointed passages and the like. We have to understand that using the appropriate language and grammar for research is as critical as the technical inputs. Every sentence should correlate with the previous and the following one. In the absence of this, one thought does not seem to lead to the other and the consistency in the entire work is lost. All the pains taken with the technical details are also wasted. It is important to take proof-reading seriously and see that each and every sentence and passage is closely read and corrected to convey the message of the research work. Therefore, to get the right review and a positive feedback for our work we have to understand that we cannot undervalue the importance of language and grammar components of our work.

At Thinklet, we are glad to receive a lot of contributions from scholars of Pure Sciences; and even in this issue, they have contributed most of the articles.

Inside the Issue

GUIDE'S COLUMN

Electronic Band Structure Study of Materials

In our quest for materials with specific properties for various technological applications, an *ab initio*, theoretical study of materials plays an important role in predicting the properties of materials. One such theoretical approach is the study of the band structure of materials. Computational methods based on density functional theory (DFT) are quite successful in describing the electronic band structures of materials. A useful approximation within the DFT is the local density approximation (LDA) and the local spin density approximations (LSDA), for the case of magnetic calculations. These calculations could describe the properties such as metallic, semi conducting, magnetic, semi-metallic, etc. of materials.

In recent years, a lot of research is being carried out towards finding an efficient thermoelectric (TE) material. A thermo electric material is one that converts heat into electricity. Although, a number of thermoelectric materials are known for a long time now, the efficiency of these, calculated as the figure of merit, is rather low. If materials with good conversion efficiency are found, that could convert waste heat from factories / industries, automobiles, etc, into useful electricity, then our dependence on fossil fuels for our energy needs could be reduced drastically. *Ab initio* calculations could give an idea about the figure of merit of compounds, considering them as "virtual crystals".

Another class of materials, that are being studied extensively, are the Heusler alloys that exhibit various exotic properties, such as thermoelectric, magneto-caloric, semi-metallic, superconducting and so on. The properties of these compounds depend on the constituent elements, viz., transition metal or rare-earth element forming the Heusler alloy with (the more electronegative) elements like Sn, As, Al, etc. It is interesting to note that the half-metallic ferromagnetism of some of the Heusler alloys, which is calculated correctly by the band structure calculations, have potential applications in spintronics devices.

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What is in a Name?

Whenever I hear news about caste related violence against anyone, the rational fear starts hovering in my mind. A few undesirable incidents which happened recently, made me pen down my thoughts confining to the surnames that have been in practice for decades together. The caste based discrimination is not new to India, for that matter nor to any part of the world. Even in this modern age, the plight of the people who have been categorized as lower castes is unthinkable and unbearable. The way they have been looked down upon by others is a perfect example of the modern elites who are living their life hypocritically in the garb of so called literate people.

We come to terms with the fact that there is the existence of so many villages and even cities which have been named after so called "upper and dominant" castes

Coming to these modern day Indian elites, the people who are highly educated going by the degree they have, boast about themselves saying they are beyond caste based society; it further reaches a crescendo when they say they want to create a caste-free system, but the reality hits harder when the very same person would like to keep the surname that indicates the caste which he or she belongs to. When I flip through social and other educational websites, I can see a lot of names clinging on to their first names like Sharma, Dwivedi, Trivedi, Reddy, Gowda, Iyer, Shastri, Nair and so on. This kind of caste based names have fairly come down in numbers in states like Tamil Nadu which is known for its famous Dravidian movement, but that is not the case everywhere. The irony is even the personalities who are celebrated by the people in the field of Politics and Journalism, continue to keep their caste names as so called surnames. Though a few modern elites would like to wish it away, but the hidden love that they have developed over the years with their castes keep them from doing so.

If we delve deeply into this matter, we come to terms with the fact that there is the existence of so many villages and even cities which have been named after so called "upper and dominant" castes, Joshi nagar, Shastri nagar, Gowda palya - the list doesn't stop just there. The problem lies with the state governments as they have not initiated any reforming measures to curb this kind of discrimination and cruelty meted out to socially disadvantaged people. Even if the Government would like to bring change, they cannot implement it effectively fearing changing the place name might cause a dent in their vote bank politics. These double-tongued political parties air their voice subtly against the caste based issues, but they still want to thrive on community based votes that fuels the government machinery to run smoothly.

Shedding the name for betterment of the society is always FAR SUPERIOR than shedding the blood for a cause that keeps the society caged for years to come. Elimination of caste based names is a social revolution that has to start from within and it is for a noble cause that a fellow human is to stay being human. I didn't take any individual names in this write up to illustrate the facts, after all what is in a NAME!!??

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Ph.D.- Patience – Hardwork – Dedication

These three words that have helped me go on. Pursuing research has definitely made me more patient, and all of us have to work hard to get what we want, for which we have to be 100% dedicated. Thanks to my field of work - Cancer Biology, I will always remember what Ph.D. is. I am sure this applies to any field of research. It has been three and a half years since I began my research. At times I feel my research is not progressing anywhere but I know that I will get there one day. My research involves searching for compounds produced by tiny little micro-organisms which possess a potent anticancer activity. It is indeed a challenge to come up with a positive result and the journey is not easy. There has to be a reproducible result for us to take the next big step. The challenges faced throughout will point out more wrong than right. And I personally feel that failure is a great motivation to go in the right path. It takes approximately 25 to 30 years to come up with an effective medicine and I have the confidence that my research will be of great help one day; that day I will be very proud. Human body is very complex. It is still unknown why things go wrong. I come across articles everyday with new discoveries which keeps my hopes up high for a cure for cancer. And it is our job as researchers to find out about the unknown factors for which we need a Ph.D, and P.H.D.

I personally feel that failure is a great motivation to go in the right path

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Control of Tuberculosis (TB): A National Priority

Tuberculosis (TB) caused by *Mycobacterium tuberculosis* is one of the deadliest infectious diseases, affecting more than one third of the world's population and killing nearly 2 million people around the world each year. Keeping this in mind, the 24th of March every year has been designated as World TB Day. It is pertinent to note that about one fourth of all the cases of TB in the world occur in India with about 2.2 million new cases being reported every year. Despite the availability of effective short-course chemotherapy and the Bacillus Calmette-Guerin (BCG) vaccine, the tubercle bacillus continues to claim more lives than any other single infectious agent. This alarming state of affairs had prompted the World Health Organization (WHO) had declared tuberculosis as a 'global emergency' in the past. This year the theme of World Tuberculosis Day 2017 is 'Unite to End TB'.

Over the years in response to the conventional treatment regimens, strains of multidrug resistant Tuberculosis bacteria have arisen

Why has Tuberculosis remained a deadly disease for so long? The reason is, that over the years in response to the conventional treatment regimens which are often poorly followed, strains of multidrug resistant Tuberculosis bacteria have arisen which are refractive to even the current generation of anti TB drugs. A recent news report released by the Bruhan Mumbai Municipal Corporation mentioned that the incidence of Multi Drug Resistant Strains of TB in 2016 is up by 21% compared to the previous year. Another reason is that due to the poor immunity associated with TB patients, co-infection with HIV seriously aggravates the disease.

So what is the way ahead in tackling this insidious bacterium? Doctors treating this disease have made a strong appeal to fast track the introduction of the latest drugs to tackle drug resistant cases. This should be coupled with stronger surveillance, since as per a recent report, many cases go unreported which could continue to spread infection in the community. The role of other factors such as poverty, malnutrition, poor housing and sanitation, compounded by other risk factors such as HIV, tobacco, alcohol use and diabetes, can also increase the risk for getting TB.

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The Need for Sustainable Agriculture in the Current Scenario

There is an exponential increase in both environmental damage and human population worldwide leading to insufficient production of food with the existing agricultural practices. Contemporary approaches to agriculture include the use of chemical fertilizers, herbicides, fungicides, and insecticides to control pathogenic microbes. Chemical pesticides not only kill the pest organism, but also many non-target species, including beneficial ones. They pollute the environment, poison plant products and are also expensive.

Researchers have focused on a more sustainable and environment friendly approach with an emphasis on human health, quality of foods as well as on their organoleptic and nutritional properties

To put an end to this, researchers have focused on a more sustainable and environment friendly approach with an emphasis on human health, quality of foods as well as on their organoleptic and nutritional properties. Most of us would have in some way benefited from the research without realizing it. One of the remarkable achievements is using soil bacteria more efficiently as a part of mainstream agricultural and/or horticultural practice to minimize risks for human health, the growing cost of pesticides, and environmental contamination.

In spite of the advantages, to date, only 1 percent of soil microbes have been employed in agricultural practices and many others have remained unexplored owing to technical, economical and attitudinal barriers. There is a need to address topics which have not previously been researched, provide a sufficient means of evaluating the alternatives by filling gaps in knowledge, theories about how something might work better and thus contribute to existing knowledge and debates.

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Algal Biodiesel– A Promising Alternative to Fossil Fuel

The major source of energy for all our energy demands comes from the combustion of fossil fuel. Dwindling fossil fuel reserves and the environmental pollution on its combustion has led to the frantic search for alternate sources of energy which are renewable and eco-friendly. Biofuel which is fuel derived from living matter is an alternate energy source which can emerge as a substitute for fossil fuels in meeting our increasing energy requirements. Biofuel is currently derived from food and oil crops and this is believed to cause food shortage and dissatisfaction particularly in developing countries. However, microalgae can provide an alternative biofuel feedstock owing to their rapid growth rate, carbon-di-oxide gas fixation ability (net zero emission balance) and high lipid content, and non competition with human and animal food crops.

If established as a successful energy source, it can help meet the world's growing demand for transportation fuel while reducing greenhouse gas emissions

Algae are eukaryotic, photoautotrophic organisms which are adapted to a wide range of ecological habitats. The term algae include microalgae, macroalgae and cyanobacteria. Under optimal growth conditions, algae synthesize fatty acids for the synthesis of membrane lipids and this constitutes about 20- 50 % of their dry cell weight. Most species of algae have the ability to accumulate significantly higher amount of lipids under adverse environmental conditions by altering their pathway for lipid mainly in the form of tri acylglycerol (TAG) which are the precursors of biodiesel.

My research topic is biodiesel production from algae which involves isolation of algae from freshwater sources, screening for lipid production and biodiesel production by trans-esterification of lipids. I am indeed proud to contribute in a small way to the search for renewable, green fuel. Algae-based fuels are still in the initial stages. If established as a successful energy source, it can help meet the world's growing demand for transportation fuel while reducing greenhouse gas emissions. However, the biggest hurdle is the uncertainty of cost and difficulty in harvesting. Microalgae can emerge as a source of energy, and with the suitable growth protocols they may address some of the concerns raised by the use of food crops for biofuels.

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Why Animals? Why Now?

Animals have had the greatest share of space on this planet. They were here even before our species came into being. It is unfortunate to see man becoming the center of all and the ecology highly imbalanced. When studying about the different representations of animals in different texts written by different writers, the one question that always crops up is: "Why look at animals now?" It appears to be a straightforward question until one makes a sincere attempt to learn the latent meaning.

"Everywhere animals disappear. In zoos they constitute the living monument to their own disappearance."
- John Berger

Anthropomorphism has been integral in the building of the relationship between humans and animals. The need for man to be in the center has created a barren space where animals are gradually disappearing form their spheres, and in this new solitude, anthropomorphism makes man doubly uneasy. Animals now are made commercially available in the form of toys and artifacts, and this commercialization carries different symbolic representations (often stereotyped) which are affecting the human-animal relationship.

Most of the literary works have used and still use animals as tropes; they are primarily used as part of the *setting*, and *Ecocriticism*, one of the emerging literary theories, is concerned with this. The real animals are marginalized, and bringing them to the critical center is indeed the need of the hour.

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In Conversation with the Experts

This month we bring to you an interview with Ms. Pinky Chandran, the Founder-Director of Radio Active, an urban community radio station catering to diverse and heterogeneous groups in Bangalore, licensed to the Jain Group of Institutions. Ms. Chandran has been heading the radio station since its inception in 2007 and has been an active participant in the advocacy of community media. She was elected Joint Secretary of Community Radio Association, India, and Secretary of its South Zone Chapter. She has been part of various working groups and committees, set up by the Ministry of Information and Broadcasting and has also been deputed by Commonwealth Educational Media Centre for Asia (CEMCA) to mentor various initiatives and programs. Ms. Chandran is a steering committee member of the South Asia Network for Community Media (SANCOM), a virtual network launched in 2015 to promote a democratic and pluralistic media environment. Radio Active has been the recipient of various national and international awards such as the Manthan Award in 2010 for their sustainability programs. With a mission to feature the various voices of Bangalore, Radio Active operates out of the Palace Road campus of Jain University and is available at 90.4 Mhz.

What is community radio and how did the idea of Radio Active come about?

Community radio has been envisaged as a medium to provide voice, and in doing so envisions a system where common people create their own media landscape, address issues that matter to them, in their own style, language and dialect, cutting barriers of exclusion thereby giving access to representation through voice. In 2005, at the inauguration of the Department of Mass Communications, an ex-colleague mooted the idea of applying for a community radio license. Exotic as it sounded, everyone agreed. And we applied for it and conveniently forgot about it. It was in the year 2006, I was in Australia on University work and I happened to meet my former class-mate. She mentioned in passing that she was hosting Kannada shows in a community radio station in Sydney. That got me interested and I offered to volunteer in setting up the station. On my return to India, I got involved with the construction of the studio and all other related procedures, systems for the station. The name Radio Active was suggested by a former student Rohini Gupta, the first logo was designed by Aral Lobo, another student. The jingles for the station was produced by Jeevan Claude D-Souza.

Please share with us a memorable experience you had while setting up the radio station or during its initial days.

Soon after we started the station, there was a considerable amount of learning, unlearning and re-learning. In 2008, a local NGO Vimochana that works on women's issues had hosted a workshop on community radio for about forty Muslim women in JJR Nagar. So after the workshop, we were all gathered sipping tea. I was standing with a cassette recorder in my hand, and I casually remarked, we can all talk now. Little did I realize that the recorder was pointing to a woman sitting next to me! She assumed I was telling her and she repeated the question, first loudly and with every repetition her voice trembled. And soon enough she started crying. I was flabbergasted, harbouring self-doubts on what did I do. She then slowly said, "All my life, I have never been asked to talk". Paul Ricoeur's quote, "We have no idea, what a culture would be where no one any longer knew what it meant to narrate things", sets the basis for "crisis of voice", in Nick Couldry's (2010), book *Why Voice Matters: Culture and Politics after Neoliberalism*. And the incident that occurred, was a defining moment for the station as it when beyond the semantics of the word "voice", to actually questioning the rationale for why voice matters, who are those without a voice, why are voices not being allowed, where are the other platforms for voices, what are the types of voices and whose voice is it?

What have been the focus areas of Radio Active?

Radio Active's vision is to expand community's involvement in broadcasting and creating their own media, and that has driven our mission too which is: celebrate the heterogeneous identities that represent Bangalore and be a platform for different voices to be voiced through participation, partnerships and community based projects.

"He who asks, is a fool for five minutes. He who does not ask, is a fool forever"

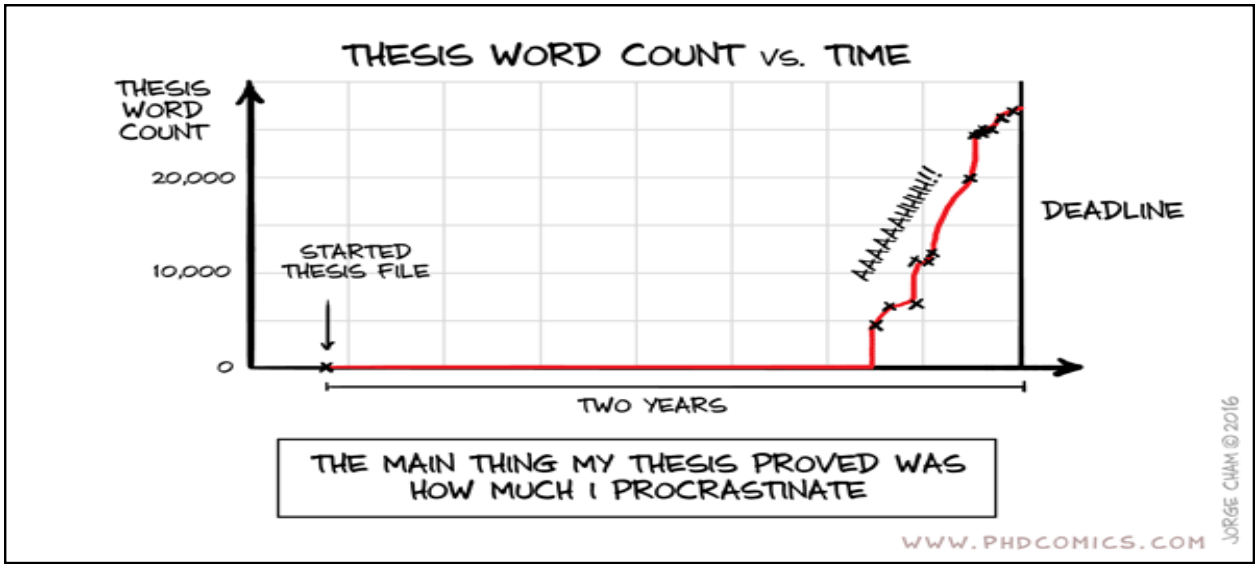
Chinese Proverb

What role has Chenraj Roychand Centre for Entrepreneurship (CRCE) played in the success of Radio Active?

Dr. Chenraj Roychand through CRCE has been a strong believer of community media and has sincerely encouraged, supported and celebrated the diverse initiatives, people, communities that the station has come to represent. CRCE has been actively supporting the democratizing knowledge production, eg. Department of Science and Technology's Project on Radio Mathematics , Curriculum Development Eg: Waste picker Training Module, Gender Sensitization , Volunteering Schemes for Students , Incubation of Social Ventures / Causes, Participatory Research through community partnerships, Participatory Policy Development and Knowledge Sharing.

How do you foresee the scope of Community Radio in India?

Community radio stations in India are increasingly creating platforms for dialogues and deliberations and are no doubt serving as a medium representing local culture. It is too early to engage in quantitative surveys of listenership and impact of community radio stations and yet it is essential to capture the essence of the community radio stations across India. Given the limited number of stations in the country there is no single model which comprehends and frames the range of experiences. And what is needed is a more conducive policy, which allows for news and current affairs, embraces innovation and convergence of other media platforms; in addition to allowing stations that are 10 years old to continue and build a legacy. But what is equally important is to relook at expanding spectrum, map the frequency allocation, cull out non serious applicants, set right frequency clash, and not limit stations located in the University campus to set up transmitter in the same place but be flexible. They must also allow for relocation, rather than make it a fresh application.



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PLEASE INCLUDE YOUR NAME, E-MAIL ADDRESS AND THE KNOWLEDGE DOMAIN OF YOUR INTEREST