ACCT™

Academic Conferences in Current Trends

International Conference On Research and Development in Science, Technology, Engineering, Management, Applied Sciences, Pharmacy, Education, Law and Humanities : The Futuristic Approach

Prashas Research Consulting Pvt. Ltd.

Hyderabad, India,

in Association with

CENTRAL CHRISTIAN UNIVERSITY

Malawi, East Africa

5th, Feb 2022

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Message from Organizing Committee

Dear Professors and Researchers

Prashas Research Consulting Pvt. Ltd. Is the World Leader in PhD Consulting, Prashas is a Sanskrit Word for **"Gift of God"**. We at Prashas are Dynamic, Flexible, Creative and Result Oriented Leaders in Research Consulting We at Prashas have occupied a Niche Market in the field of Education and we are specialized in Doctorial, Post Doctorial and its aligned services.

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We conduct Conferences Regularly and invite topnotch Speakers from various streams to talk and share their knowledge to the audience.
On Feb 5th we conducted an international conferences titled:" **International Conference On Research and Development in Science, Technology, Engineering, Management, Applied Sciences, Pharmacy, Education, Law and Humanities : The Futuristic Approach"** 12 speakers from various streams have delivered their speeches and shared the knowledge and 72 scholars from across India have attended the conference

The main goal of organizing this conference is to share and enhance the knowledge of each and every individual in this fast-moving Information Era. We believe that this conference will prove to be very valuable to the decisions and future success of all
We wish all the very best for their future endeavor

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Prashas Research Consulting Pvt Ltd

MESSAGE FROM Chief PATRON

It is with gladness that I present this introduction to the Book of Abstracts as President, Central Christian University.

This Conference aims to bring together leading professionals from various streams So that hat they will have a forum to share their experiences, research results and methods and developments Multi Disciplinary concepts and their contemporary applications as we move ahead in this 21st Century. The Book of Abstracts portrays the synopsis of the papers of these great contributors to the Conference.

Thanks to the team members of Prashas Research for organizing this relevant and all-important Conference. I commend them for leading the drive towards this conference.

This Book of Abstracts is a prelude to the Conference Proceedings. I wish all of us happy deliberations at this all-important conference.

Prof OSman H NyaKULEHA
Central Christian University

Disclaimer

About this Conference

The responsibility for opinions expressed in articles, studies and other contributions in this publication rests solely with their authors, and this publication does not constitute an endorsement by Prashas Research Consulting Pvt Ltd or Central Christian University of the opinions so expressed in them.

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Benefits of Online Learning

A significant merit of online learning is that it enables education institutes to overcome the restriction of limited resources. Over the years, the student population in many countries has increased at a higher rate than the physical educational resources. Many institutes have therefore had to cope with overcrowded classrooms while others have been forced to schedule classes at odd hours so as to deal with the high number of students.

This resource strain has led to a decrease in the quality of education offered to the students. Online education gives schools an opportunity to expand their capacity since it is not constrained by things such as classroom space. In addition to this, online education enables the school to make optimal use of their teaching staff. One teacher can offer lessons to hundreds of students at the same time using the online environment.

Another major advantage of online learning is that it enables student to overcome the barriers of time and distance. Under the traditional system a person has to attend educational institutes physically. This system makes it impossible for people who want to study but have time limitations for example because of their work schedules. In addition to this, students who live far away from the educational institute and lack the means to move nearer so as to be able to attend school were locked out of the traditional system.

Online learning helps to overcome these barriers by enabling the student to learn in a more dynamic environment (Bennett, Marsh and Killen 321). Students can choose to have the virtual classes at the time which is most convenient to them. Students who live far from the educational institute can also enroll and take lessons from their current locations.

Online learning has significantly reduced the cost of acquiring education for many people. As it currently stands, education is significantly expensive and people are required to part with significant amounts of money so as to finance it. This is especially the case with higher education where in addition to the tuition fee paid to the school, there are other costs such as: accommodation costs, foregone income as one has to give up fulltime employment, and travelling expenses.

Signature with Seal
Name Dr B V V Prasad

MALLA REDDY UNIVERSITY Hyderabad

It is a well-known fact that the legal profession has rich tradition and a long history. It's called noble profession, involved in the process of the justice delivery system. There is paradigm change in the structure of legal education, after the establishment of national law universities in India, with 5 years multi-disciplinary integrated course. In law schools until recently, education was being imparted in the most theoretical manner. Now it has been realised that there is a need to bridge the gap between law in books and law in courts. Legal education now provides a more pragmatic and experiential teaching methodology which comprises competency-based learning and a practice-orientated focus.The nature of crimes and civil disputes has been changed. New offences relating to Cyber security, Cyber forensic; Forensic science, white collar crimes are emerging. Accordingly, the courses associated with Information Technology, Machine learning, Biotechnology and other science subjects need to be incorporated in the curriculum to understand the issues of present society.

India has the world's second largest legal profession with more than 12 Lakh lawyers. The conception of legal services as a 'noble profession' rather than services resulted in formulation of stringent and restrictive regulatory machinery. These regulations have been justified on the grounds of public policy and 'dignity of profession'. After independence, and adoption of Indian Constitution, we established our own justice delivery system.

Ours is the biggest network of legal system after USA. There is a need to re-structure legal curriculum, to enable students to understand experientially how the law works in practice, drafting, arguments, presenting the case, communication, to provide a realistic context in which students can apply the law and applied communication skills. Learning by experience, is always remembered in heart and mind. Experience can be gained through case studies, real life situations, nature, involvement with the Local Community, understanding their problems, policies of the Government, hurdles, solutions...

In the era of digitalisation, there is tremendous change in nature of legal profession. One has to be technically sound, socially relevant, and professionally competent. Law students and lawyers should make use of the technology to participate in virtual proceedings. Moreover, law students should know social media skills, data analytics, artificial intelligence. Considering the huge pendency of cases, more emphasis should be given to arbitration, conciliation, and settlement. Corona Pandemic taught us many lessons, so need to adopt new techniques to deal with Post-Covid challenges.

Dr. Ashok Yende Former Professor,

Head & Director, University of Mumbai

VIGNAN'S LARA
INSTITUTE OF TECHNOLOGY & SCIENCE
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I am very happy to note that **Prashas Research Consulting Pvt. Ltd, Hyderabad** organizing an International conference in association with **Central Christian University, Malawai, East Africa** on **"ACCT"** The recent research made by Professors/ Scholars, and students of global Universities, and colleges would be a virtual feast for new thought in the respective domains. It will hopefully provide a fresh and incisive vision and add a new fillip to the process of advancements in the country. A new chapter of knowledge would set the promising trend to the ongoing research in the field of academia on such a broad canvas and vast scales. The challenges to keep abreast with technology and apply it in the discharge of our functions, especially in improving our service delivery either in public assistance or investigation, become imperative, as enemies of accountability use technological advancement to perpetrate violations of public trust. Now, more than ever, we need good governance to respond effectively to any disaster, whether natural or manmade and to enable countries to bounce back from any debilitating effects. The ACCT international conference has been a much-valued platform for sharing knowledge and best practices which contribute to the robustness and resiliency of its members to address whatever challenges it may confront. I trust that the session will enrich and equip us with the useful information we can apply when we go back to our respective institutions/places. I want to thank the Organizing team for publishing Souvenir on this grand occasion. I wish it all success.

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Higher Education, Futuristic Change and Global Demands

At the outset, I appreciate the organizers for conducting a need-of-the-hour International Conference inviting Speakers specialized in their respective Domains from various parts of India focusing on latest developments, research and multidisciplinary approaches in the fields of Science, Technology, Pharmacy, Management, Education and Humanities.

As a Keynote Speaker, it gives me immense pleasure to deliver my thoughts while Chairing the session and presentations by various Research Scholars of different universities across India.

I would like to sensitize the participants and academicians of this conference about the following things.

The industrial Revolution 1.0 to 4.0 has given rise to various discoveries, innovations and technological developments across the world. The impact has been in every field hence research contributed a lot benefitting human kind. A 5 MB Hard Disc in 1956 used to be the size of a cupboard which is now transformed in to a 0.5 inch Micro SD Card fitting into a mobile phone. We are able to see Holograms, Space Travel, Air Cars and so on. All these things happened due to continuous research.

Many organizations and corporate companies like Google, Microsoft, IBM, Adobe, NASA, Master Card, Pepsi have CEOs of Indian origin. Hence, every Researcher can think of doing something substantial in their fields of study so that India can be kept on world mad time and again.

Keeping in mind the latest programmes such as *Skill India*, *Make in India* and *Atma Nirbhar Bharat*, the Higher Education and Research activities must be re-tuned. Today's generation needs more skills than just degrees to create employability as per the demands of growing industries.

17 Global Sustainable Development Goals (SDGs) decided by UNO must be taken into consideration as India adopted it in 2018. The Skills set suggested in *Future of Jobs Report* 2018 by World Economic

Forum, World Health Organization, McKinsey report and Skill India Report must be integrated into various Curricula and Syllabi of Courses for future development which is also emphasized in National Education Policy (NEP 2020). Multidisciplinary Courses and Interdisciplinary research becomes the immediate need now. Mindset and Skillset go hand-in-hand.

Indian researchers and academicians must keep in mind about our glorious, ancient education system spreading wisdom to the world countries for the past many centuries. Great universities such as Takshashila, Nalanda, Vallabhi and the like where intellectuals like Kautilya, Varaha Mihira, Bhaskara and many more had been teaching and conducting research in many fields. All the above attracted explorers, travelers, historians and trades men like Megasthenes, Ptolemy, Huen Tsang, Colombus, Marco Polo, Alexander, Ibn Batuta, Mughals, Mongolians, French, British, Dutch, Portuguese and many more.

To bring back that ancient legacy, we need to do more research and publish a lot so that the world knows the importance of our country improving the quality of the present Higher Educational Institutions and global ratings. Think of the following:

- Do we compare our existing knowledge, wisdom, skills etc., with any other countries in the world?
- What were the reasons in our history causing cultural and intellectual losses so far?
- Who is mostly responsible for these things?
- How can we educate our own people and the world for future development?

Road Map Ahead for Higher Educational Institutions in India

I wish the following initiatives will be taken up.

Develop Teaching Intensive Universities

- Methods, materials and testing – revise and upgrade
- Identify existing lacunae and adjust further
- Train the staff in grey areas- Edu Tech, Software and Tools
- Evaluate and prepare reports periodically

Develop Research Intensive Universities

- Research areas- Domain and Interdisciplinary
- Research methods
- Data Collection and Analysis tools – SPSS, R, Python

- Train the staff
- Encourage Paper Presentations at Conferences- Sponsor Faculty
- Encourage Publications
- Evaluate and prepare reports periodically

Develop Multidisciplinary Education and Research Universities (MERUs)

- Identify new subjects – Focus on essence of Culture, Society and Nation
- Create new combination of courses
- Design Curriculum
- Develop Materials

In conclusion, I congratulate the Founder and Team, ***Prashas Research Consulting Pvt Ltd***, Hyderbad, for creating a forum online wherein many topics, issues and solutions are discussed by the Experts and Presenters across India.

I wish them all the best in their academic, professional and research initiatives in future.

Thanks and regards.

(Dr. Kalyana Chakravarthi Thirunagari)
Visiting Professor, Research Guide & Life Skills Coach, Hyderabad

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FOREIGN CONTRIBUTIONS TO CHARITABLE TRUSTS IN INDIA: THE FUTURISTIC APPROACH

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Abstract

Charitable trusts have played an important role in providing support to the down trodden classes in India. The working of Charitable Trusts becomes even more essential during times when crisis like pandemic hit humanity. In last few decades the foreign contributions are found as the most valuable leading support available to these charitable trusts. The Foreign Contribution (Regulation) Act, 2010 is a very crucial legislation regulating these contributions. On September 28, 2020, the Parliament has passed the Foreign Contribution (Regulation) Amendment Act, 2020 (Act No. 33 of 2020). The amendment has introduced many decisive changes to the FCRA. The amended Act controls individuals, organisations and businesses' receipt and the use of foreign contributions. Here, the term "foreign contribution" refers to the gift or transfer by a foreign source of any cash, security, or product (within a specific value range). The researchers have discussed the amendment made to the FCRA in 2020 and its futuristic impact on the Charitable Trusts especially during the pandemic.

Keywords: Amendment to FCRA, 2010; Charitable Trust; COVID 19 Pandemic; Foreign Contribution (Regulation) Act, 2010; Foreign Contributions.

Introduction

In India, non-profit organizations, charitable trusts, and the laws regulating the same, may be traced back to a wide range of religious beliefs and activities prevailing since immemorial time. The underprivileged in India have historically been helped by religious organizations such as Christian missionaries. As a result, charitable non-profit organizations began to form and flourish since British Rule. India's independence war saw a rise in the popularity of non-profit organizations. Those, who had the means to do so, formed charity organizations like schools and orphanages, and they made donations to keep them running. Due to increased wealth and prosperity brought on by the industrial revolution, the number of charitable trusts and non-profit organizations dedicated to social good grew significantly. Thousands of non-governmental organizations (hereinafter referred as NGOs) in India that perform wonderful job in reaching out to the downtrodden and assisting them are registered under the Foreign Contribution (Regulation) Act, 1976, which allowed them to accept foreign contributions to fund their work. To ensure that foreign donations do not jeopardize national security, the Foreign Contribution (Regulation) Act, 2010 (hereinafter referred as FCRA, 2010) has created a mechanism for supervising the organizations, institutions and individuals receiving foreign funds.

It has been alleged that the Amendment of 2020 to the FCRA may drastically affect our struggle with COVID 19 as it has potentials to prevent NGOs from receiving foreign contribution. Many new provisions added by way of this Amendment has increased complications in compliances and thereby creating difficulties in collecting and distributing the foreign contributions at grassroots level for purchasi006Eg lifesaving drugs and equipments. Against this background, it is necessary to understand what these amendments are and how they may pose challenges for the organizations receiving foreign contribution as a substantial financial source for their survivals.

The Context of Futuristic Approach

Recently, one US based organization, Global Peace Initiatives, approached Hon'ble Supreme Court of India challenging the expiry of the FCRA licenses of approximately 6,000 NGOs and requested the court to let these NGOs continue their licenses until further orders. It has background of Covid 19. However, the Apex Court declined to pass any interim order directing the government to extend the validity of such expired licenses. The Court opined that it could take up the pending cases (Noel Harper v. Union of India, Jeevan Jyothi Charitable Trust and others v. Union of India) on the validity of the amendments made to the FCRA in 2020 before making any conclusion about the request made. This requires a futuristic approach to resolve such issues immediately.

The Foreign Contribution (Regulation) Act, 2010

The FCRA is in charge of overseeing foreign donations to make sure they don't compromise national security. It was first enacted in 1976, and the currently applicable regulation came in existence in 2010. FCRA applies to all non-profit organizations that want to accept donations from overseas sources. Sec. 11 of FCRA, 2010 requires that every person shall accept foreign contribution only with the certificate of registration form the Central Government and only if it have a definite cultural, educational, economic, religious or social programmes. So, Insights Editor (2022) has argued that in India, all the NGOs expecting foreign contributions must be registered with the FCRA. The FCRA also provides that the original registration certificate is valid for five years and it can be further extended for a specified purpose and a specific period if all the standards of the law are met. If any person is not registered as required u/sec. 11 (1) of FCRA, 2010, the person can accept foreign contribution only after obtaining a prior permission of the Central Government and such prior permission will remain valid for a specific purpose and for contribution from the specific sources only.

The Central Government is empowered to conduct a summary inquiry and, during pending enquiry, to direct that such received contributions shall not be utilized or no further contribution to be received if the Central Government has reason to believe that there is violation of any provision of FCRA. It is also provided that the unutilized or un-received amount, if violation is proved, shall not be utilized or received. It can be utilized or received only after the prior permission of the Central Government. The Central Government is also empowered to notify in the official Gazette to specify the person or class of persons who shall obtain prior permission before accepting foreign contributions and the area or areas in which the foreign contribution shall be accepted or the purpose or purposes for which foreign contributions can be accepted or utilized or the source or sources from which the foreign contribution shall be accepted.

The foreign contributions for social, educational, religious, economic, and cultural programmes can be accepted by registered groups only. The compulsory filing of annual tax returns is also required mandatorily. India's Ministry of Home Affairs (MHA) has issued guidelines in 2015 that required non-governmental organizations (NGOs) to sign an undertaking that accepting foreign funding would not compromise India's sovereignty and integrity or harm cordial ties with any foreign state. To provide real-time access by security authorities, all such NGOs must have bank accounts with nationalized or privately owned institutions with core banking capabilities.

“Any acts damaging to the national interest” are prohibited under the FCRA, 2010, which limits access to foreign contributions for individuals, organizations, and corporations. To accept foreign money, NGOs in India has to apply first to the Central Government (Ministry of Home Affaires) for FCRA Certificate and then comply with onerous procedural regulations for reporting, disclosure, the transfer of cash, and the use of funding. Guidelines for the Act’s implementation were established under Section 48 of the FCRA 2010, and these FCRA Rules 2011 comply with that section.

In short, the charitable organizations are required to follow the FCRA, 2010, which governs how foreign donations are accepted and put to use. There is an attempt to guarantee that these donations do not harm national interests by passing the 1976 legislation. Every organization in the country hoping to collect donations from outside must comply with the law. For a period of five years, each of these organizations must be registered with the FCRA, which is renewable if they continue to abide by the standards set out. According to Sec. 2 (1) (h) of FCRA the term foreign contribution includes all the donations, deliveries and transfers made by foreign sources, any currency or foreign security. The articles given as a gift to a person for his personal use are excluded from the definition.

The FCRA Amendment, 2020

On September 28, 2020, in the midst of the corona virus epidemic, the Foreign Contribution (Amendment) Regulation Act, 2020 has modified the FCRA, 2010. The significant changes brought through the amendment have been discussed below. Prohibition to accept foreign contribution: The Act has prohibited certain persons to receive foreign contribution. It includes the editors and publishers of newspapers, election candidates, and members of Legislature at Union or State level, political parties and organizations as specified. The Amendment of 2020 has included the judges, public servants, government servant or employees of the corporation either controlled or owned by the government. Prohibition on the Transfer: The Amendment Act of 2020 regulates the transfer of foreign contributions received by any person, even if the foreign contribution is received after prior permission or registration certificate u/Sec. 11. The prohibition is u/Sec. 7 which provides that the foreign contribution cannot be transferred to any other person unless the person to whom it is to be transferred is also registered to receive foreign contributions or has obtained prior permission as required under FCRA, 2010 to receive any foreign contribution. It means one registered NGO can’t transfer its foreign contribution to another registered NGO if both the NGOs are not eligible to receive foreign contributions under FCRA, 2010. Hence, now one National level NGO cannot collaborate with local NGOs for efficient working at grassroots level, if it involves transfer of foreign contributions, unless the receiving NGOs are registered to receive foreign contribution or has obtained prior permission from the Ministry of Home Affairs for receiving that foreign contribution. In the course of time it will increase administrative cost of the National level NGO as it will have to develop its own network at grassroots level.

Establishment of a bank account with the State Bank of India in New Delhi: Previously, Sec. 17 of the FCRA, 2010 authorized the beneficiary of foreign contributions to receive them in an account created with any of the scheduled institutions. The Amendment Act of 2020 repealed the old Sec. 17 of the FCRA, and now, the new Sec. 17 requires that the foreign contribution shall be received in only one FCRA account in a branch of a scheduled bank as specified by the government. For that purpose the Government has specified the State Bank of India, New Delhi to open and maintain FCRA Account. It requires every NGO to receive the foreign contribution in only one single bank account, designated as a “FCRA account” in the State Bank of India at New, Delhi. It is to be noted that the FCRA, 2010 has allowed NGOS to register another bank account in any scheduled bank for retaining or utilizing the foreign contribution. It means every NGO has to maintain one FCRA account in the State Bank of India to receive foreign contribution and then after it can be transferred to any other bank account in a scheduled bank throughout India to use that contribution.

Limitations on the use of foreign contribution: The Amendment Act of 2020 requires all the NGOs to use the funds received for the specified purpose for which they were obtained. The Amendment has changed Sec. 8 of the Act by decreasing the administrative expenditure threshold from 50% to 20%. Previously, the beneficiary may utilize 50% of the foreign contribution to cover administrative expenditures such as salaries, wages, travel expenses, and costs associated with employing people. The Amendment has reduced it to 20% only. Freezing the foreign contribution: The FCRA, 2010 empowered the Central Government to conduct inquiry, on the basis of any information or report, to find out the alleged contraventions of the provisions of FCRA, 2010. The Amendment of 2020 has added a provision providing that the Government may restrict further use of unutilized foreign contribution, even if prior permission was given to receive such contribution, if the Government believes that any person has contravened the provisions of FCRA, 2010. This power can be exercised by the Central Government even during the summary inquiry, pending the final outcome of the inquiry.

Surrendering the Registration Certificate: The Amendment Act of 2020 has inserted Sec. 14A in FCRA, 2010 which provides for surrendering the registration certificate under this newly added provision, the Central Government may permit any person to surrender registration certificate obtained for receiving foreign contribution u/Sec. 11 of FCRA, 2010 This provision has paved a way for voluntary surrendering of registration certificate. Such surrender can be allowed if the Central Government is satisfied that the person surrendering certificate has not contravened any provision of the FCRA, 2010 and that the foreign contribution and the asset created out of it has been vested in the authority as per the norms of the Central Government. .

Suspension of certificate for more than 180 days: The FCRA, 2010 had a provision for suspension of certificate for a period not exceeding 180 days. Now the Amendment has added a provision for extended suspension for additional time which may be extended up to an additional 180 days. Aadhaar number as identification document: The Amendment has included Sec. 12A empowering the Central Government to require any person to give information about Aadhaar number or a copy of the passport or overseas citizen card of all office bearers, directors and other key personals as a proof of identification.

These are the major changes, among some other small changes, made by the Amendments in 2020 to the FCRA, 2010. These changes are challenged through many litigations and are pending before Hon’ble Supreme Court of India. So, the real and long lasting impact of these changes is not perfectly predictable today. However, following are some of the major situations and circumstances, required to be considered in these regard.

Impact of the Amendment on Charitable Trusts

The Amendment has introduced many “extremely vague and open to abuse” concepts to the FCRA, 2010. The concepts which were already declared as “vague and open to abuse” were again used by the government through this Amendment. While dealing with the FCRA Rules 2011, Hon’ble Supreme Court held that the NGOs having no connection with party politics or active politics have right to have foreign contribution and the scope of “political nature” shall not be expanded beyond the NGOs involved in “active politics” and by any means in the “party politics.” The Court found that the word “political interests” used in Rule 3(v) of the FCRA Rules 2011 was extremely “vague” and “open to abuse.” It also opined that the valid forms of “political actions,” such as bandhs and hartals, as defined in Rule 3(vi), are protected [under the Constitution of India] and that the FCRA cannot be utilized to deny an organization its constitutional right to receive foreign contributions.

The inclusion of public servants and government servant or employees, u/Sec. 3 of FCRA, 2010, in the provision prohibiting receipt of foreign contribution will affect them as they could not receive foreign contributions even for some valid reasons. Similarly, the smaller NGOs will be notably affected by the provisions made u/Sec. 7 prohibiting transfer of foreign contributions. The Amendment of 2020 has put restrictions which have shown a clear intention of the Central Government to make it more difficult for NGOs to provide their services at the grassroots level. Most of the time, the national level NGOs don’t have their own network at the grassroots levels and they depends on the network of local NGOs to reach people. The National level NGOs may receive foreign contribution and transfer it to the local level NGOs to carry on the charitable work efficiently. Under such circumstances, Sec. 7 of FCRA, 2010 will drastically affect the existence of some NGOs. Without this network, it would be nearly impossible for the majority of NGOs to continue and fulfill their mission and the local level smaller NGOs will face lack of sufficient funds.

Additionally, the FCRA Amendment of 2020 reduced the amount of administrative costs that may be allocated to foreign donations from 50% to 20%, while also increasing governmental control, restrictions, and certification procedures for NGOs. Reducing the percentage of administrative expenditures in order to ensure that “the precise aim of the contribution is met” is troubling. It was found (International Commission of Jurists, 2020a) affecting efficient working of NGOs, when the second wave of COVID-19 was killing more people than ever before in India, many NGOs took up the cause and diverted their focus away from their normal operations toward assisting those affected by the second wave. Other groups were required to contribute to the availability of essentials such as medical oxygen, ventilators, hospital beds, and medications. This specific amendment most emphatically did not take the gravity of the circumstance into account and more stringent requirements for registration were established in the FCRA Amendment Rules 2020.

An overwhelming issue with regard to the FCRA’s impact on NGO, as pointed out by the International Commission of Jurists, (2020b), is that the legislation is subject to abuse and arbitrary interpretation because of the FCRA’s vague and wide language. Organizations of a “political nature” and those engaged in actions contrary to “public interest,” “economic interest,” or “security” are barred from obtaining an FCRA license because of the restriction on receiving foreign funding for such organizations and those engaged in such activities. This has created rooms for misuse of powers and arbitrariness.

Discussion and Analysis

Prima facie the provisions of FCRA, 2010 and the Rules made there under are not in accordance with the India's obligation to the freedom of association under the international human rights law and the treaties to which India is a party. It is also notably imposing unreasonable restrictions on the exercise of freedom of speech and expression, freedom of association and right of participation in public affairs. It affects work of human rights defenders and NGOs working at International level with collaborations and supports of local NGOs in India.

The futuristic approach requires that the funding shall reach to the grassroots NGOs, most of which do the real work. But the provision about restriction on the transfer of funds to other persons under Sec. 7 will affect co-ordination and collaboration between different NGOs and prevent percolation of funding to the grassroots NGOs. It will also increase the administration cost of the large NGOs, if they themselves have to create network at the grassroots level. Again there is provision providing restriction on it. It is Sec. 8 which has reduced use of foreign contribution from 50% to 20%. The futuristic approach requires increasing the said limits from 50% to 60% or even more than that as too many expenses are covered under the administrative cost. With inflation, the administrative cost is increasing and hence the limit of foreign contribution to be used for administrative cost has to be increased and not to be decreased as it is done through the Amendment of 2020.

The futuristic approach requires that the accounts of the NGOs shall not get freezed for indefinite period on the basis of preliminary inquiry as provided under Sec. 11. Because, there is no time limit for the completion of enquiry and indefinitely suspending account on the grounds of suspicion is violation of the principles of natural justice. There can be recovery of amount, if in future, any NGO is found guilty of contravening any provision of the FCRA, 2010. The provision about inquiry and review before every renewal provided u/Sec. 16 is also not according to futuristic approach. Because it provides room for harassments and it is not necessary, specifically when there is provision about mandatory obligation of disclosure of receipts and expenses. This is not necessary specifically when there is provision about FCRA account to be maintained at State Bank of India, New Delhi Branch under amended Sec. 17 of FCRA, 2010.

Hence, we can safely conclude that the provisions added through Amendment of 2020 to the FCRA, 2010 are unnecessary and needs revision for better future of NGOs receiving foreign contributions. This is very true, specifically when there is no record to show that there has been large scale misappropriation or miss-management of the foreign contributions received till date. Due to such drastic laws the foreign contributions received in last few years have shown sharp decline. One research study (Bain and Company, 2019) in this regard has shown that there has been 40% reduction in a foreign contribution in the last few years. For example, in 2018, out of the total 70,000 Crores received from the private sources, only 13,000 Crores were received from the foreign sources. Similarly, the Government has been empowered under Section 9 to prevent any individual or organization from accepting donations from overseas if the funds will jeopardize India's sovereignty and integrity, the public interest, or the harmony of religious, racial, socioeconomic, linguistic, or regional groups. By themselves, these regulations ensure that no foreign element ever intervenes in the country's everyday activities through their gifts. So the Amendment of 2020 was not called for, at least during the COVID 19 pandemic.

Conclusion

The flaws mentioned in this research cast considerable doubt on the government's accountability and goals. Recently, in response to various petitions filed by NGOs in the Delhi High Court, the Ministry of Home Affairs has extended the deadline for opening of the FCRA account in the State Bank of India at New Delhi. However, taking such a measure in isolation will not solve India's current problems in receiving foreign contributions for the smooth working of the NGOs engaged in charitable purposes. Considering the gravity of the issue, the Government should reconsider whether these modifications will benefit the country and should take proactive efforts to decrease the obstacles in the working of the NGOs seeking foreign contribution by focusing on the futuristic approach as discussed in this research. It is illogical to create obstacles in the working of genuine organizations operating for decades for charitable purposes. There are many laws helping the Government to root out the NGOs engaged in antisocial activities. So the drastic provisions inserted by way of Amendment of 2020 are superfluous and redundant, especially during raging pandemic situations. The FCRA, 2010 before such Amendment of 2020 has sufficient measures authorizing the Central Government to control the foreign contribution if the Government suspects the NGOs of violating any provision of the Act.

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THERMODYNAMIC FUNCTIONS VIZ. ENTHALPY AND HEAT CAPACITY OF SUBSTITUTED PYRIDINE

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Abstract

The thermodynamic functions of 3-amino -4, 6-dimethyl-2-hydroxy pyridine have also been calculated by using IR and Raman frequencies at different temperature with the help of computer programming.

Introduction

N-Heterocyclic molecules like pyridine, pyrimidine, cytosine, uracil etc. and their derivatives are of immense importance as they play a central role in the structure and properties of the biologically important nucleic acids. It has been shown by Jesson et al [1] that pyridine molecule has planer structure in the ground state and quasi planar one in the excited state. Major part of the work on pyridine regarding the spectral studies was tabulated by Wilmshurst, Bernstein[2], Innesand co-workers [3]. Many workers [4] also studied the vibrational spectra of biologically important pyridine derivatives through the high complexity and low symmetry of these molecules have made the interpretation extremely difficult.

Several workers [6] have shown the investigations for few amino substituted pyridine and substituted benzonitriles which constitutes the basis of this discussion.

The objective of the investigations under study is to identify the IR and Raman frequencies corresponding to the substituents as well as to the ring fundamentals and their correlations with similar molecules.In view of the above discussion, the present chapter reports the vibrational spectra, ultraviolet spectra in different solvents and thermodynamic constants of the 3-amino-4, 6 – dimethyl-2- hydroxy pyridine is reported and discussed.

Experimental

The infrared spectra of 3-amino -4,6-dimethyl – 2-hydroxy pyridine known as 3,4,6,2-ADMHP is recorded region in the 400-4000 cm-1on Perkin Elmer Spectrophotometer model 52 using KBr pellet techniques. The statistically computed thermodynamic functions viz. enthalpy and heat capacity with absolute temperature are given in table 1. The variation of the enthalpy function and heat capacity with variation of absolute temperature is shown in fig 1 and 2.

Thermodynamic Functions

The computation of the thermodynamic viz. enthalpy function (Ho–Eoo)/T and heat capacity (Cpo) and appears to be one of the most important application of the study of IR and laser Raman spectra of the complex molecules. The data are obtained from the vibrational spectra [7], Tolmanand badger [8], first suggested that it is quite possible to calculate with accuracy the values of various thermodynamic quantities. This is of great practical importance particularly since the direct experimental measurement of these quantities is quite difficult and some time impossible. The values of thermodynamic functions calculate from the spectroscopic data are more accurate than the values obtained by the thermal measurements [9].

The various thermodynamic functions were computed at different temperature from 100-1500 K by taking the rigid rotor harmonic oscillator approximation for one mole of the perfect gas at one atmospheric pressure. These functions have been calculated by using standard expressions refined from time to time [10-12] by taking Y-axis perpendicular to the molecular plane and Z-axis to pass through the para positions. For determining the rotational contributions of the title molecule. For 3, 4, 6, 2-ADMHP standard structure parameters were used.

The symmetry number for the overall rotation has taken as 2 and the internal rotation as 2 for said molecules. The principal moment of inertia were found to be 0.5637 and 1.3993x 10-37 gm-cm2 for 3, 4, 6, 2-ADMHP. The calculated values of enthalpy function and heat capacity in Table 1 for the said molecule under investigations respectively.

The values of the entropy and other thermodynamic functions do not differ appreciably for the molecule which shows that the change in the position of the group attached with pyridine does not bring much change in their thermodynamic functions. Similar trend is reported from the observed fundamentals as shown in Table 1.

The graphical representations of enthalpy functions (Ho–Eoo)/T and heat capacity (Cpo) with absolute temperature in figure1 and 2 for the title molecule respectively. The thermodynamic functions calculated here are in good agreement with the trend reported in the literature [12-15].

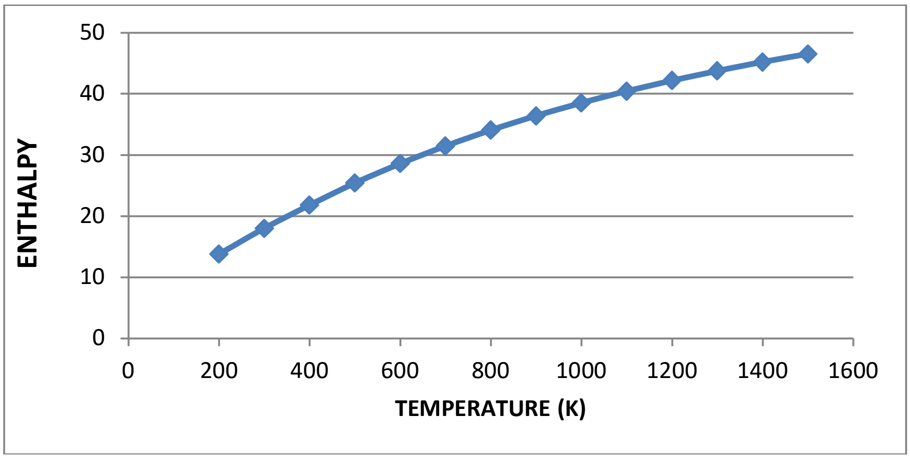

Figure 1: Variation of enthalpy function with absolute temperature

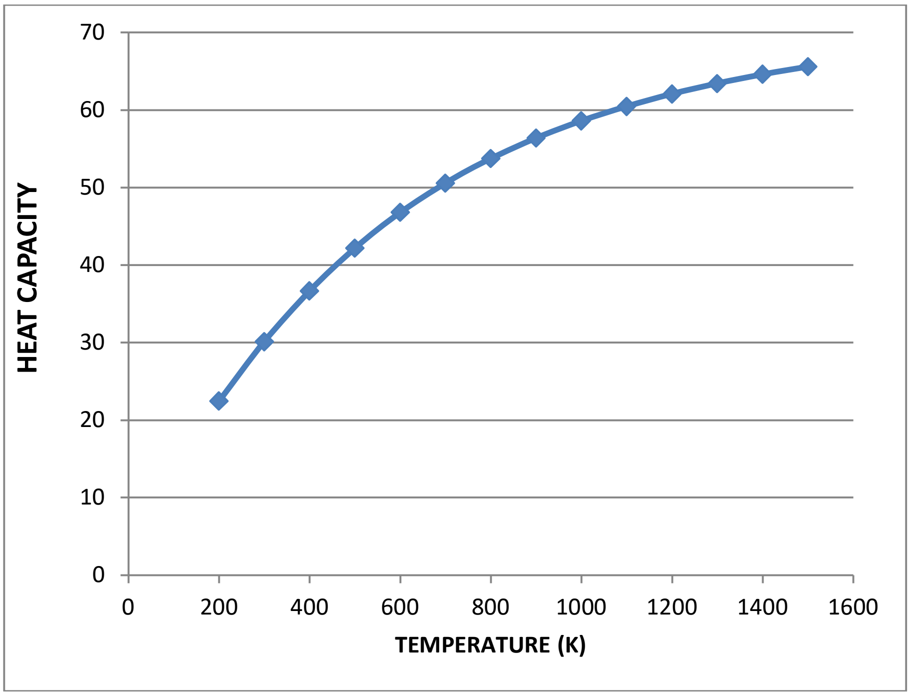

Figure 2: Variation of heat capacity with absolute temperature

TABLE 1
THERMODYNAMIC FUNCTIONS OF 3, 4, 6, 2-ADMHP
(CAL/MOLE-K)

TEMPERATURE(K)	**$(H^0 - E_0^0)/T$**	**C^0_P**
200	13.53	23.70
300	18.47	32.52
400	22.85	39.19
500	26.66	44.46
600	29.99	48.69
700	32.92	52.14
800	35.51	54.99
900	37.81	57.36
1000	39.86	59.34
1100	41.71	61.02
1200	43.38	62.44
1300	44.90	63.65
1400	46.27	64.69
1500	47.53	65.59

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REAL-WORLD VS SIMULATION - A STUDY TOWARDS THE DEVELOPMENT OF A PHOSPHATE ION SELECTIVE ELECTRODE (P-ISE)

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Phosphorus is a scarce and finite resource on the planet, and its non-gaseous environmental cycle makes access to non-mining means unavailable. At the same time, it is also one of the three most important (N, P, K) phytonutrients. It is added to agricultural soil by applying chemical fertilizer and spraying manure. However, when not completely consumed by crops and plants, it can be mobilized under reduced conditions and enter groundwater and surface water as leachate and / or runoff. To reduce the impact on this issue, research in this area is primarily focused on finding more optimal application rates (manure and chemical fertilizers) and efficient ways to recycle phosphorus. Accurate quantification of phosphate recovery can be achieved by performing a number of real-time, high spatial resolution soil measurements. However, there are currently no commercially available sensors that can measure soil phosphorus in real time on the go. The research described in this white paper is a preliminary attempt to solve this challenge.

The Academic And Education Analytics Of Student And Teacher Learning Process - An Empirical Study On Student Performance

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The main objective of educational institutions in India is to achieve the development of the student not only in knowledge but also in practical implementation of that knowledge. One of the ways to achieve the mentioned objective is to monitor the students continuously and adapting the various methodologies or training needs for different students with different levels of understanding. In higher education academic institutions for improving student performance and retention, most of them have adopted the academic analytics and learning analytics. Due to this pandemic situation, the educational institutions under different universities should adapt the use of digital platforms. As the virtual teaching and learning has been initiated completely in full fledged environment, it now became very easy to access the data of the learner. Hence, it made all the data collection an easy task and I am presenting the empirical study of the various articles, which have given their contribution towards the student learning and performance enhancement. I had discussed about the concept of big data analytics, learning analytics, academic analytics and education analytics in higher education, where the student learning, student performance evaluation and retention has been penetrated.

TOOLS FOR CONDUTING EFFECTIVE ONLINE LEARNING

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Online teaching and learning denote education that takes place over the Internet. An important number of colleges in India and abroad are switching from out-of-date face-to-face classes to entirely online, web-based courses. Online education, often mentioned as distance education or web-based education, is currently the latest, most popular form of distance education. It has, in recent times, become an essential part of many university curriculums. This paper delivers a brief overview of online learning and the selected communication tools for online teaching and learning.

CROWDFUNDING: A NEW FUND RAISING APPROACH TO STARTUP FOR BUSINESS

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Getting finance for business startup is most difficult and risk task for business creators. Finance in business is like blood, just as the human body is without blood, so is business without finance. There are many resources / ways to start a business. But in the beginning it should be clear how much money is needed and when. Financial needs vary depending on the business model and the size and product. So many people are struggling, or fail to generate funds, in due to absence of relationship with industrialists or bank due to lack of sound financial tract record or pledge. This paper is going to study to examine the new trend in financing; that is crowd funding, types and challenges of crowd funding, fund raising platforms, funding for new companies and new entities and how it is helpful to capital deficit units.

IMPACT OF E – SHOPPINGON RETAIL BUSINESS

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Retailers include of a large segment of the population and a larger population is dependent upon these retailers. But the introduction of online shopping with their attractive incentives and wide varieties has slapped on their face the fear of uncertainty and helplessness. This study looks into the various aspects about how retail businesses are being affected and also the various recovery mechanisms they are coming up with to counter those e-stores in their race of survival. This paper also undoes the effect upon the effectiveness of the various concerns due to increasing trend for online shopping.

SCHOLASTIC AND ENTHUSIASTIC IMPACTS OF ONLINE LEARNING DURING THE COVID-19 PANDEMIC ON STUDENTS

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While there has been an upsurge in transition to online learning taking place mostly in higher education, many countries around the world have had to leave their brick-and-mortar schools all of a sudden and necessarily turn to fully-online education since the outbreak of Corona virus pandemic (Covid-19). Foremost, there is a paucity of previous research regarding how tertiary institutions are trying to cope with keeping students engaged during COVID-19 pandemic and the closure of many tertiary institutions globally. The population was 656 students and then a sample of 357 students (87 males and 270 females) was taken using a simple random sampling technique. This study will help uncover critical areas and contribute to local literature on the subject, which in turn could be used by relevant authorities in improving their education initiatives. Teachers may realize the importance of undertaking studies in information technology and online modes as a means of up-skilling their teaching abilities. The finding of this study will rebound to the benefit of HE institutions by providing them important insights into ICT integrated teaching, enabling them to strengthen their programs to better prepare lectures to deal with the diverse emergencies of the COVID-19 pandemic.

RTE,2009: IMPLICATIONS IN INDIAN EDUCATION SYSTEM

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The importance of education cannot be denied in one’s life. It sustains the human values which contribute to the individual and collective well-being. It forms the basis for lifelong learning and inspires confidence to face challenges. It provides the skills to individuals to become more self reliant and aware of right opportunities. It also enhances the ability of individuals to act more responsible and more informed citizens and have a voice in politics and society, which is essential for sustaining democracy. It is essential for eradicating poverty and it allows people to be more productive and playing greater roles in economic life and earning a better living. The education is the key which allows people to move up in the world, seek better jobs, and ultimately succeed in their lives. So education is very important, and none should be deprived of it. The importance of primary education has been neglected by India since independence knowingly or unknowingly. However, Government of India now is willing to improve primary education by bringing legislation i.e. Right to Education. The paper tries to bring out the meaning of much awaited Right to Education (RTE) 2009, act and tries to bring out the critical appraisal of the Act after three years since its passage.

ROLE AND RELATIONSHIP BETWEEN MENTAL HEALTH AND FORGIVENESS

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Human nature as understood through the lenses of evolutionary biology, moral philosophy, and theology contain the capacity for evil and for good, for harming and for helping, for offending or reconciling. Forgiving may be the most difficult task in person lives but it is a universal phenomenon. Forgiveness has physical, mental, social and spiritual benefits as well. Good mental health can enhance one's life, while poor mental health can prevent someone from living an enriching life. Forgiveness or beat contrary feelings and judgment of a man or of causing irritation, included mental, enthusiastic and Behavioral frameworks, it implies that individual will be have no adverse feeling, judgment and behavior than the individual who forgive him. Forgiveness is a reaction that make possible to sustain relationships despite the mistakes, betrayal, or failure to meet the expectations. The purpose of present study was to ascertain the relationship of forgiveness with mental health. The reason of this problem can be done of the present study as the first step in connection with forgiveness and its relationship with Psychological variables such as mental health.

USE OF E-RESOURCES IN PARA-MEDICAL COLLEGES IN GULBARGA

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Electronic publishing is the process for creation of typeset quality documents containing text, designs, pictures, tables, equations etc. it is used to define the generation of any document that is in digitized structure. It uses new technologies enabling publishers to deliver documents and other contents rapidly and efficiently to consumers of information. In a word e-Resources are the resources published just in e-structure to achieve benefits of use and economy. E-publishing has played a noteworthy role in information industry, due to factors like economy, easy publishing and conveyance method, easy documenting and preserving just as accessing and retrieving, free progression of information utilizing computer networks, comfortable for resource sharing projects etc. Electronic resources are accepted by all information society, due to merits of e-Resources like ease in convenience, readability, reasonableness and accessibility.

ANALYSIS AND DESIGN OF STEEL STRUCTURAL ELEMENTS FOR AIRBUS A-380 HANGAR AS A P.E.B SYSTEM

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Design of any structure is defined as the process of doing calculations by taking various components weight and also lateral loads for the stability of the structure for getting optimum results and to get the nominal cost of any structure for its construction and execution. Structural elements are very much important for the design of any structure because they only carry compressive loads such as weight of roofing system, purlins, rafters, and other accessories etc. In this research work a unique steel structure has been designed with the help

of design software called staad-pro. The steel structure is designed for the maintenance of an aircraft named as airbus A-380 which is a wide body aircraft whose dimensions are noted as 73m(239.5 feets) in length, 79.8m(261.8 feets) wing span width, and 24.1m(79feets) in height. Thus in this research a steel structure as a pre-engineered building has been designed for the dimensions 120m in span width, 115m in length, and peak rafter height 30m from the floor finished level. In this research work after the quantity of steel for various members are obtained as for primary members 2143.86 MT, flange bracings consumed 60.86MT steel, sag rods 10.72MT, CHS/SHS taken 78.82MT, secondary members 133.50MT, sheeting including walls and roof consumed as 145.81MT, anchor bolts 13.24MT and for high strength grip bolts consumed 34.50 MT. Hence the total steel is estimated as 2621.31MT.

PREPARATION OF FORMULATION AND EVALUATION OF NON EFFERVESCENT GASTRORETENTIVE SOLID DOSAGE FORMS

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For decades an acute condition or chronic illness is being clinically treated through delivery of drugs to the patients in form of some pharmaceutical dosage forms like tablets, capsules, creams, liquids, ointments, aerosols, etc To attain and maintain the concentration of an administered drug within therapeutically effective range, it is often required to take drug dosage several times and this result in a fluctuating drug level in plasma Controlled or sustained drug delivery systems have been introduce to overwhelm the problem of fluctuating drug levels related with conventional dosage forms The FDDS are advantageous for drugs absorbed through the stomach and for drugs meant for local action in the stomach and treatment of peptic ulcer Acidic substances like aspirin cause irritation on the stomach wall when come in contact with it, Hence FDDS may be useful for the administration of aspirin and other similar drugs. Administration of prolongs release floating dosage forms, tablet or capsules, will result in dissolution of the drug in the gastric fluid. They dissolve in the gastric fluid would be available for absorption in the small intestine after emptying of the stomach contents. Drug will be fully absorbed from floating dosage forms if it remains in the solution form even at the alkaline pH of the intestine FDDS provides advantages such as the delivery of drugs with narrow absorption windows in the small intestinal region

URBAN ROAD INFRASTRUCTURE MAINTENANCE PLANNING WITH PRIORITIZATION USING ANALYTICAL HIERARCHY PROCESS

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The maintenance planning within the urban road infrastructure management is a complex problem from both the management and techno economic aspects. The focus of this research is on decision making processes related to the planning phase during management of urban road infrastructure projects. Priority analysis is a multi-criteria process that determines the best ranking list of candidate sections for maintenance based on several factors. In this paper, two methods for priority ranking of road maintenance, viz. Ranking based on subjective rating and Ranking based on economic indicator, are evaluated. The subjective ranking was done using maintenance priority index which is a function of road condition index, traffic volume factor, special factor and drainage factor. The second ranking method was based on economic indicator in which NPV/Cost ratio was calculated for each pavement section using the HDM software. The quality of roads as public goods should be maintained and improved time to time. In order to put the available funds on the right roads for the optimal results, roads should be prioritized. The subjective ranking was done using maintenance priority index which is a function of road condition index, traffic volume factor, special factor and drainage factor. The second ranking method was based on economic indicator the materials and method used are based on literature review. Discussion starts with the definition of local roads, the role of local road maintenance, and the definition of local road maintenance. The second part discusses the definition of prioritization, the objective of prioritization, and the roles of prioritization in road maintenance. The third part examines the common prioritization procedures conducted in planning process reflecting prioritization methods used in road maintenance prioritization.

AUDITING AND ACCOUNTING PERCEPTIONS OF INDIAN COMPANIES: WITH REFERENCE TO SUSTAINABILITY

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Audit analysis is a widely recognized practice for enhancing the efficiency of auditing services. In 1988 a daily quality peer examination by the American Institution of Accredited Public Accounting Companies (AICPA) was made mandatory (Alam et al., 2000). The federal government was under pressure to control the auditors more rigorously after the failure of major multinational firms in the US-Enron and WorldCom at the end of this 100th century. In 2002, the Sarbanes-Oxley Act (SOX) formed the Public Company Accounting Oversight Board (PCAOB) to evaluate the audits of government corporations.

The Financial Reporting Council (FRC) supports high-end business governance and reporting through the UK's autonomous regulator. The FRC establishes governance, accounting and auditing rules and practices, analyses the public interest study, and is empowered by competent accountants to prosecute wrongdoing. Although FRC has direct regulatory powers with respect to audit legislation, certain of FRC's roles do not include legislative funding, but are the product of strong support from UK professional bodies. In compliance with the requirements of the Companies Act 2006, FRC shall be sponsored by the audit profession.

"The PCAOB with a mandate to create audit standards and inspect and discipline the errant auditors has unleashed a regime of autonomous audit companies which until then have been self-regulated." When a non-profit corporation is under the oversight of the SEC, PCAOB accepts the Board's laws, standards and expenditure, and even appoints the five representatives and chairman of the Board. PCAOB PCAOB is mainly funded by public enterprises and dealers by means of the service payments.

Auditor's rules for public accountants; the frequent reviews of licensed public accounting companies for the purposes of conformity with the regulations; and the penalties for erring auditors were very successful in auditing public accountants in the United States by the issuance of various audit norm.

In India, the companies are embracing sustainability reporting concept as it helps them in strengthening reputation and brand. Stakeholders are informed about the sustainability report to through the company's website. However, these reports are not accessible very prominently and not every company makes an effort to communicate to their stakeholders about their sustainability performance. Thus, it becomes mandatory that the sustainability reports should be verified and audited by an independent auditor so as to ensure credibility and transparency.

This research will analyze Auditing and Accounting Perceptions of Indian Companies.

A COMPREHENSIVE REVIEW OF THE STATE-OF-THE-ART OF OPTIMAL ACTIVE AND REACTIVE POWER FLOW FROM VARIOUS PERSPECTIVES

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One of the maximum essential equipment in energy grid control and manage is most effective energy waft, a mathematical programming trouble that extends energy waft connections. The foremost goals of OPF, to say a few, are to meet device call for at the bottom viable cost, with the least quantity of pollution, and with the least quantity of voltage variation. The OPF can be divided into foremost categories, specifically most effective energetic energy waft and most effective reactive energy waft, as it has been on the center of energy device demanding situations for 1/2 of a century. The power flow is a certainly hard non-linear and nonconvex trouble; however, it receives even greater complicated whilst extra constraints and boundaries associated with actual energy structures are taken into account. Furthermore, with trendy energy networks, energy device operators impose in addition regulations at the trouble.

As a result, the OPF trouble receives an increasing number of complicated, doubtlessly worsening the scenario from a mathematical and computational viewpoint. As a result, figuring out the only techniques for fixing diverse varieties of OPF issues is critical. Despite the truth that numerous mathematical-primarily based totally procedures were used to clear up the trouble over the years, there are positive drawbacks that limit them from being an everyday solution for extraordinary variations of the OPF trouble. Many lecturers have proposed new methods, including heuristic algorithms, to clear up such difficulties.

These present-day algorithms were within side the limelight for greater than a decade due to the fact that they show a extensive diploma of comfort in managing more than a few optimization issues, irrespective of their complexity. This observe provides an in-intensity exam of the maximum latest makes use of heuristic-primarily based totally optimization algorithms to deal with diverse variations of the power flow issue. In accumulation, an intensive exam of extraordinary procedures from numerous views is provided. Index Terms - Optimal energy flow, Active Power Flow, Reactive Power Flow, heuristic algorithms

EDUCATION ANALYTICS BASED ON MACHINE LEARNING AND STATISTICAL MODE

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Education is at the heart of the national public agenda in a growing number of countries. Decision-makers need to consider more systematically the role of universities as instruments of economic development and social mobility, making it imperative important to ground higher education policies carefully on evidence about what works. Similarly, at the institutional level, universities must learn to guide their transformative efforts with a more thorough analysis of their strengths and weaknesses and a deeper understanding of the factors behind the results of successful universities. This introductory article shows how the lessons of experience can help understand what works and what does not work in higher education policy under various conditions and circumstances, in order to increase the probability of success and avoid repeating the mistakes of others. Use of computers in education is now ubiquitous. Students have access to course media through a variety of devices including PCs, tablets, and smart phones. The data generated by online learning platforms have the potential to change the way we teach and learn. In this brief, we explore the role of analytics in teaching and learning. In particular, how learning analytics can lead to educational process innovation. We will explore history, current state, tools, privacy issues, case studies, and future potential for analytics-based education. This study collects and summarizes information on the use of learning analytics. It identifies how learning analytics has been used in the higher education sector, and the expected benefits for higher education institutions. Empirical research and case studies on learning analytics were collected, and the details of the studies were categorized, including their objectives, approaches, and major outcomes.

BIG DATA PROCESSING USING MACHINE LEARNING ANALYTICS

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'Big Data' is a term that defines the huge volume of data that is growing exponentially. Machine Learning is used to train machines by feeding them datasets and making algorithms that enable machines in problem-solving and decision making. Machine learning is a method of data analysis that automates analytical model building. It is a branch of artificial intelligence based on the idea that systems can learn from data, identify patterns and make decisions with minimal human intervention. Machine learning is the process in which machine uses the data provided by big data and then try to respond accurately accordingly thus leading to improve business operations, service quality, customer relationships, and more. Machine learning gets data from big data and learns more data they have at their disposal.

THE ROLE OF ENGLISH CURRICULUM IN DEVELOPING EMPLOYABILITY SKILLS OF UNDERGRADUATE STUDENTS: A TEACHER'S PERSPECTIVE

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Careers and the world of work have witnessed a sea change in the recent years. The business environment today is marked with rapid and volatile changes. Globalization, technological breakthroughs and intense competition have forced widespread organizational transformations. These far reaching changes have influenced virtually all aspects of the functioning of organizations, including the management of human resource. Standing at the verge of the beginning of their career, the university graduates of today are confronted with the much challenging and demanding job market. The new world of work demands such knowledge, skills and other vital attributes that were not required from a traditional employee. The traditional job market has undergone a radical change. English is fast changing in its role with the changing times and needs. It has travelled a long way from the language of colonization, artistic expression, knowledge acquisition & production, research, and now employment. Many graduates in India are found to be unemployable due to their poor employability skills. This study is mainly conducted to understand the importance of adopting English curriculum in colleges for enhancing employability skills in undergraduate students. This study is survey based approach in which questionnaire was distributed to 250 teachers where only 200 revert back. Frequency, percentage and pie charts have used for analyzing data.

UNDERSTANDING THE USE OF INFORMATION TECHNOLOGY FOR LEARNING OF STUDENTS WITH HEARING IMPAIRMENT

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ICT in curriculum is a strong force for accelerating educational modernization. Students with disabilities will benefit from the many advantages of utilizing ICT in the classroom as well. ICT could include features and resources that may assist students with disabilities. Individuals who are deaf or hard of hearing fall under the group of students who need special education. The hearing disabled was classified using a variety of criteria. Individuals of hearing loss have differing perceptions from someone that can understand which puts them at risk of misinterpreting expression. As a result, students with hearing impairments can find it challenging to attend lecture material that demands a high level of language comprehension. The aim of this paper was to investigate how students with hearing disabilities in deaf schools use and perceive technology for communication and learning.

ULTRASTRUCTURAL DEFORMATIONS INDUCED BY 10% EC CYPERMETHRIN ON THE SCALES OF CYPRINUS CARPIO

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Chronic toxicity test under sublethal dose (0.44µg/l) of cypermethrin (CYP) was performed to study the scales of fresh water fish, Cyprinus carpio for 45 days. CYP is widely used insecticide due to its low toxicity for birds and mammals but it is highly toxic for non target organisms including fish. Cyprinus carpio has been selected as our fish model as it is third most important fish species of India, regarded as vulnerable to extinction by IUCN. Scale under control group (maintained with distilled water) showed regular morphology whereas the cypermethrin exposed scales were noticed with severe alterations in their microstructures. Exposure of cypermethrin for 15 days revealed depletion of calcium from dorsal surface of scale, displacement of lepidonts and curled intercirculi spaces. The level of anomalies was increased on the 45th day of exposure which represents complete deterioration of scale with damaged focus, uprooted lepidonts, perforation in the tubercles with breaked circuli along with complete loss of lepidonts.

ANALYZING THE RELATIONSHIPS BETWEEN ACHIEVEMENT MOTIVATION, PERSONALITY FACTORS AND FAMILY ENVIRONMENT

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In present day age of the way of life individual have been changed from various perspectives. These impacts additionally appear in the way of life of adolescents. These are confronting numerous mentally and physical issues throughout their life. The instructors and guardians likewise worry with the adolescent's issues. They show helping mentality towards the issues of adolescents and huge number of juveniles adapt to this stage as a result of their backings. In any case a few adolescents discover trouble in adapting to this stage. Family support is a significant factor in the present change of adolescents. On the off chance that the guardians are filling in as an inspiration factor in taking care of adolescent's issues, the modification of pre-adult with mental, physical and scholarly and vocation is better. In this way there is relationship between family environment and achievement motivation of adolescents. At the point when family environment advances achievement motivation, at that point it likewise happens constructive outcomes on personality factors. It appears that achievement motivation is essentially relies upon family environment and personality factors. This reality remembers analyst intend to concentrate how achievement motivation corresponds with family environment and personality factor.

FACTORS RESPONSIBLE FOR THE FAILURE IN ACADEMIC ACHIEVEMENT OF HEARING IMPAIRED CHILDREN IN INCLUSIVE EDUCATION

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Inclusion is a worldwide movement today. Inclusive education gained momentum since the World Conference on Special Needs Education held in1994. At the same time 'inclusion' has been the focus of researchers in the recent past. It is noticed that there is a difficulty for a child with special need in learning but this is not to a problem within the child, but to the school system. Therefore to know the progress of inclusive education at the elementary level in the last few decades, the researcher in this study attempted to explores the barriers for successful implementation of inclusive education in primary schools of Ranga Reddy district. Descriptive survey method is adopted for the present study. In which interview was scheduled for 187 teachers from 10 primary schools for collecting primary data. Frequency, percentage analysis methods were used for evaluation the data. The data is represented in tabular and graphical format. Findings indicates that teachers facing problems in teaching children with hearing impairment which turns in bad academic achievement for such children. Practically, this study is beneficial in terms of having better understanding about the implementation of the inclusive education & its challenges.

RAPID, SIMULTANEOUS ESTIMATION OF LLOD AND LLOQFOR DETERMINATION OF RIBVARIN, IDOXURIDINE, VALACICLOVIRAND NITAZOXANIDEUSING LC-MS/MS

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Dr. A.Lakshmana Rao, Research Supervisor, Career Point University, Kota Rajasthan

The context of pharmaceutical analysis plays an important role in the quality assurance and quality control of bulk drug samples as well as pharmaceutical formulations. Drugs introduced into the market has been increasing at a paid rate. These drugs may be either new entities or partial structural modifications of the existing drugs and which are included in one or few pharmacopoeias, because of several reasons. Under these conditions, standards and analytical procedures for these drugs may not be available in official or may be inaccessible. Hence it becomes necessary to develop newer analytical methods for such drugs. Chromatography is the most powerful technique available for the resolution of these mixtures. The features that distinguish chromatography from most other chemical methods of separation is, that two mutually immiscible phases are brought into contact, one phase is stationary and other is mobile. Among different chromatographic methods, high performance liquid chromatography (HPLC) offers a greater variety of stationary phases, which there by allows selective interactions and more possibilities for separation. The separating column being the heart of chromatography provides separation of ionic compounds, organic compounds, liable naturally occurring products, polymeric and high molecular weight poly functional compounds.

ADVANCES IN MACHINE LEARNING FOR CYBER SECURITY USING TENSOR FLOW DATA MODEL

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Cyber Crime is a crime which involves the use of digital technologies in commission of offence, directed to computing and communication technologies. The universal approach of network like internet at all levels of network needs to recover from committing illegal activity in all over the world and to stop the criminal nature by protecting unlawful activity by enforcing different level of firewall setting within its offline control for every nation in order to monitor and prevent crimes carried out in cyberspace. Network security controls are used to prevent the access of hackers in networks which includes firewall, virtual private networks and encryption algorithms.
In this research work we are describing cyber security aspects using tensor flow data model as knows as KF model (Tensor flow model) represent for detecting of various cyber security issues along with machine learning approach. Critical infrastructure, business operations, bank operations, military operations, and communication systems are totally dependent on computer systems that control almost all aspects of life. The global network includes faxes, cellular phones, satellites, and more than 650 million people connected to the Internet. With this scenario, every year the larger software corporations in the world, such as Microsoft, SUN, Oracle, and Linux Distributors, release a new version of their operating systems, service packs, databases, and desktop and server applications for all those platforms. The motivation behind the present work was the realization that with the increasing traffic and increasing complexity of attacks, none of the present-day stand-alone intrusion detection systems can meet the high demands for a very high detection rate and an extremely low false alarm rate. In view of the enormous computing power available with the present-day processors, combining multiple Intrusion detection system to obtain best-of-breed solutions has been attempted earlier.

PERFORMANCE OF TOP 10 MUTUAL FUNDS WITH THE VIEW POINT OF BROKERS AND FUND MANAGERS TOWARDS INDIAN MUTUAL FUND INDUSTRY

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The mutual fund sector has grown satisfactorily within the past decade. From the period when it had been experienced that a cost savings oriented institution such as the device trust of India has to be started during the early 1960's, the business continues to grow tremendously in the past ten years. In reality, the whole nature of the market has totally not only in quantitative factors. The mutual fund sector nowadays proffers a really broad range of selections for investment to the prospective investors. The business continues to grow in stature to such an extent it today functions as a moderately solid counter force on the overseas institutional investors in the stock markets during periods of high volatility that is the hall mark of the sustained intermediate bull runs in the stock markets.

RURAL MARKETS – OPPORTUNITIES AND CHALLENGES FOR FMCG SECTOR AFTER COVID19 – A REVIEW

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Abstract

Rural marketing is the new mantra as for as the business is concerned, especially after the Covid 19 era. In India, there are millions of villages available. Now with the 4G broadband mobile connectivity and satellite televisions, we can say the majority of the rural areas are well connected. This gives boom for the marketers to take their products to the rural markets from where they can expect year on year growth in their companies' turnovers. Because the markets consist of metropolitan / cosmopolitan cities, tier 1, tier 2, and tier 3 towns are almost saturated and the competition is neck to neck there. Marketers must try to get their due share in these markets to sustain their business because here the paying capacity of the people is more. At the same time, if they want to grow their business consistently means, rural marketing is a boom for them. Industries like FMCG, Automobile, Pharmaceutical, Telecom, FMCD, etc. have a very good scope in the rural markets. Covid 19 gave a good opportunity for marketers to switch to digital marketing in a very short period. Not only the youth population but also people up to the age group of sixty-five can be very easily reached by this new digital medium. The pandemic was quickly made use of by these marketers because people, particularly in the rural markets started spending more time in the digital world during this period. So there is no second thought that rural marketing is a boom after Covid 19 for the marketers.

Key Words – Rural marketing, covid19, pandemic, digital marketing, FMCG, market growth

Introduction

According to the National Commission on Agriculture, "Rural marketing is a process which starts with a decision to produce a saleable farm commodity and it involves all the aspects of market structure or system, both functional and institutional, based on technical and economic considerations, and includes pre-and post-harvest operations, assembling, grading, storage, transportation, and distribution.

Gone are the days when marketers had the view that the rural market deserves low-quality products – which is completely different from the products made for urban markets, the rural population is mostly illiterate, high priced products cannot be sold, etc. In the twenty-first century, rural markets are well connected with urban areas. Moreover, with the various Government efforts, the income of the rural population is increasing steadfastly. The literacy rate is increasing fast in rural areas. Projects like the "SarvaAbhiyanSiksha" from the Central Government help in improving the literacy rates even in the micro rural pockets. Rural markets deserve products at par with their urban counterparts now.

The objective of the Research

The basic objective of this research is to delve into the rural marketing by the companies and to find out how the covid19 pandemic has opened an array of hopes for the marketers to go rural. Many industries like the hospitality industry have been worst affected by the pandemic. Whereas industries like Fast Moving Consumer Goods (FMCG), Telecom, and Pharmaceuticals have gained much making use of the covid19 pandemic. This research tries its best to highlight how the rural areas are still untouched by major marketers and the opportunities available for them to divert their attention towards the rural and semi-urban markets. It highlights the mammoth growth of the new age media and the factors like the mobile data penetration into the rural area thereby showing clearly the new opportunities available for them.

Scope of the Study

This research paper was initiated to show the companies that if they want to improve on their market share they must go rural. Because the covid19 pandemic has thrown open wide opportunities for them. This is the objective of this research paper. At the same time, companies have their limitations while spreading their marketing strategies to the rural areas like understanding the rural population's likings, distribution challenges, communicating in the local languages, etc.

Review of Literature

According to Regina Mihindukulasuriya in the print.in,3 June 2021 "Moving at a growth pace over 3x faster than urban India, rural areas will likely force many changes in how the internet is accessed and the digital ecosystem at large."

India's rural internet user base is growing over three times faster and is quickly catching up to surpass the urban user base, according to a 3 June report released by Internet and Mobile Association of India (IAMAI) and consulting firm Kantar.

"While internet users grew by 4% in urban India reaching 323 million users in 2020, digital adoption continues to be propelled by rural India — registering a 13% growth in internet users over the past year," the report stated.

The Fast Moving Consumer Goods (FMCG) sector that almost always found favor in rural regions took note. Mr.Nadia Chauhan, Joint Managing Director and Chief Marketing Officer of Parle Agro, affirmed the beverage company has always had a pan-India strategy rather than focusing on either rural or urban but also mentioned that rural India has always been on its mind.
Mr.Mohit Joshi, Chief Executive Officer of Havas Media Group India sees the pandemic as a mere bump that cannot eclipse the potential of rural India. He adds that there is no doubt the future lies in the rural markets.

"They are becoming more and more promising, and with the right investment in education, infrastructure, women empowerment, financial schemes, and technology, they are bound to be more pivotal to the growth of our economy."
DDB Mudra's Strategy Head, Anand Murty, says rural consumer sentiment is leading the charge after the second wave.

He says: "While rural consumers aren't yet bursting with optimism about current economic conditions, they are looking more confident about the future and expecting an improvement in the financial and business environment."

Mr.SharadVarshney, National Planning Head at Dialogue Factory, Group 'M' says, "With the pandemic accelerating digital adoption, rural Indians are also increasingly relying on digital services for their day-to-day activities, while major e-commerce retail giants are expanding their distribution and deliveries in small towns or at taluk headquarters,”

Rural marketing enthusiast and YES Securities’ Marketing Head, Mr.AmitBhandare added, “All in all, the second wave ended up strengthening rural market fundamentals, amid other conducive factors like good monsoons, adequate water levels across reservoirs from last year’s decent rainfall, higher crop harvests, better minimum support prices, and growing non-farm incomes,”

"Rural has been a good engine for FMCG for the last few quarters, and it continues to be resilient. Hopefully, we see a good monsoon and this will augur well for the rural economy, Hindustan UniLiver CFO Mr.Ritesh Tiwari said while talking to media virtually post Q1 results.

Methodology of the Research

This is descriptive research. All data used here are secondary and are sourced through various news articles, internet data, companies’ websites, World Bank data, etc. No primary research was conducted in the field.

The Growth of Digital Media – Blessings in Disguise

A general projection says that by 2030 India will have a billion digital users. A new survey finds that responses to Covid 19 have fastened the adoption of digital technologies by several years – and it is going to stay for a longer period. The average share of customer interactions through digital mode was 19% during May 2018, but during July 2020 it touched to 53%. This exponential growth of digital media across the globe, including the rural markets has helped marketers to reach out to the rural masses very successfully.

With companies allocating more resources for the adoption of digital technology to reach out to the rural markets, the return on investments also has become crucial. So aggressive marketing to penetrate the rural markets has become the order of the day.

The Role of 4G Mobile Internet in the Rural Marketing Promotion

According to a recent survey, there are around 1.20 billion mobile connections and 470 million phone internet users in India. This is the world’s second-largest internet market. Out of which rural India registered a 45% growth in the monthly active internet users in 2019 – 20 and around 304 million internet users.
This 4G mobile internet penetration is giving a good mode of marketing to the rural masses by the marketers. The COVID-19 pandemic and the sufferings it has wrought have caused a shift in mindset. For the marketing world, it redefined consumer sentiment in many ways. Speaking in general, the challenges in rural India remains the same as ever, but what has changed a lot are the different ways a marketer can now view addressing them.

Research Strategist Ms.Shraddha Ganesh shares how digital behavior is being redefined in rural India. It is fast becoming a way of life and she cites the example of WhatsApp which reportedly has 309 million Indian users – the bulk from Tier 2 and 3 cities.

Why FMCG giants are spreading their nets fast to rural markets?

In India, the rural markets share in the Fast Moving Consumer Goods (FMCG) sector is nearly 40% and while analyzing the demand patterns in the rural markets, it indicates that it has already overtaken the urban markets over last year. So the FMCG companies have lately woken up to this fact and now started concentrating on the rural markets with no compromise on quality and brand names which are at par with the urban markets.

Nestle India, the common household name in India and the world, is planning to reach out to nearly one lakh fifty thousand micro interiors by the end of 2024. The company has taken some decisive steps in the last two-to-three years to enhance its rural footprint says Mr.Suresh Narayanan, Chief Executive Officer, Nestle India Ltd. If we compare this planning reach of the company with 2017, it is around 150% more and around 75% more compared with 2019.

According to Mr.Sanjay Mishra, Chief Operating Officer – India Sales and Chief Executive Officer – New Business, Marico - another FMCG giant, it has decided to double its distributors in the rural markets and eying to strengthen its rural distribution network as a whole to improve its market share from the rural areas.

Biscuit maker Britannia Industries Limited added more distributors in rural markets after the corona virus lockdown-led disruptions hit trade. Between March and December 2020, the number of rural preferred dealers, as the company calls them, increased from 19,000 to 23,000.

Before the Covid 19 pandemic, the growth in rural markets was very stagnant because weak monsoons and lower incomes affected consumers' willingness to spend more. The shift in consumption has come on the back of the reverse migration and spending by the Ministry of Rural Development, Government of India on key initiatives like the Mahatma Gandhi National Rural Employment Guarantee Act 2005 (MGNREGA).

On the growth of marketing in rural areas, Peter Jacob, Director – Strategy, Go Rural India Pvt. Ltd, says, "The hinterlands in India have more than 6, 50,000 towns with a population of 850 million. The telecommunication expansion in the last decade has been extraordinary and the data and information access is similar to that in any other part of the country.

The rising income in horticulture has prompted buying power adding to a better way of life compared to what was before. This has driven an increment in the market size of rural areas. Rural shoppers are additionally looking for high-quality products and price is not such a big concern."

Echoing Jacob's views, Mr.BiswabaranChakrabarti, President, Rural Marketing Association of India (RMAI), says, "It will be an extremely difficult task to put a value tag to rural marketing segment. But 70% population of the country contributing to about 50% of buying is a huge pie of consumption. Delivering them the right product at the right place and the right price lies in the hands of rural marketers."

Traditional media such as Outdoor Advertising, TV, and Print still play a vital role in establishing brand awareness. But today, the emerging media, digital marketing has become an important mode in the media plan for almost all the brands operating in the rural markets. Digital marketing has also expanded its horizons in the rural market. With the increase in smart phone penetration and internet access, more videos and content are being developed for consumption by rural customers. Return on Investment based campaigns is on the rise.

The rural marketplace has been evolving at a constant pace over the last few years and is now overtaking the urban market. ‘Go rural’ is the marketer’s new slogan. Indian marketers as well as multinationals, such as Colgate-Palmolive, Godrej, and Hindustan Lever have focused on rural markets. Thus, looking at the future endeavors, which rural markets have to offer to the marketers, “It can be said that the future is very promising for those who can understand the dynamics of rural markets,” concludes Jacob.

Women Self Help Groups – Role in supporting Governments and their Own during Pandemic
“The women’s movement that started as a leap of faith some 15 years ago has proved to be an invaluable resource in these difficult times. Our partnership with the Government of India in building social capital among the rural poor has paid off in spades,” said Ms.Gayatri Acharya, who leads the World Bank’s $750 million support for India’s National Rural Livelihoods Mission. NRLM is India’s flagship program to reduce poverty by mobilizing poor rural women into self-help groups and building community institutions for the poor.

A group which consists of around 12 to 20 members who are in the age group of 18 to 60 and are residing in the same locality can organize themselves and form a ‘Self Help Group’. Because of the good patronage extended by various Governments, Banks, and other financial institutions these self-help groups are performing well.

They are being trained regularly by various Government agencies and departments in the manufacturing of innumerable small-scale businesses. Various subsidies extended by the Governments, liberal financial assistance from banks, and other financial institutions come as a big support for the self-help groups in starting and successfully running entrepreneurship.

During the beginning of the pandemic, India faced a severe shortage of Personal Protective Equipment (PPE) kits and face masks. The women’s self-help groups came forward instantly to support the Government and the private hospitals by producing these items on a war footing.

Over the past two years, nearly 20000 self-help groups across the twenty-seven Indian States have produced approximately twenty million masks, one lakh liters of sanitizers, and 50,000 liters of hand wash. This noble work not only helped the society overcome the shortage of these products, but it also helped these women entrepreneurs to earn livelihoods for millions of women folks across the country, mainly the rural area. And in turn, these activities helped the rural economy to boom even during this Covid 19 pandemic days.

According to Mr.Junaid Ahmed, World Bank Country Director in India, "Women at the center of development has been an important story in South Asia. In these extraordinary times, when we are all united in our fight against the Covid 19 virus, these women’s groups are playing a critical role"

Women's Self Help Groups are being supported by the Government of India's National Rural Livelihoods Mission (NRLM) which is co-financed by the World Bank. And in turn, NRLM has multi-fold increased the SHG entrepreneurship style across India’s 28 States and 6 Union Territories of the country, including more than 67 million women.

These women's self-help group members have so far saved a whopping Rs.11000 crores and leveraged a further Rs.4000 crores from commercial banks.

Finding of the Study

The finding of the study has indicated that 'go rural' is going to be the new normal for the marketers to improve upon their profitability and growth track. The Government of India's mission of 'Digital India' helps further the rural market growth because the Central and various State Governments have taken various investments in the digital area connecting the rural areas. This gives an excellent opportunity for the marketers to turn their strategies towards the rural markets. So they must concentrate on the rural markets for rapid growth in the coming days.

Conclusion

The rural market after Covid 19 is certainly a boom for the marketers. Because nearly two-thirds of the Indian population lives in rural areas and the rise in digital penetration and other factors like the various Government schemes, the role played by the women-dominated self-help groups, etc. propels the growth of the market buying power. In the rural markets, especially for Micro, Small, and Medium Enterprises (MSME), the availability of digital media during these pandemic days is a great boon.

Because digital media is very easy to adopt and also it is very economical, the agricultural sector needs seeds, fertilizers, pesticides, and also tractors and other farm equipment are picking up very fast post covid19 because of the good monsoon which prevails across the country. This sector is like a mother to all sectors. So if this sector sees overall growth, it will have a positive impact over other sectors like FMCG, FMCD, automobile, telecom, etc. So, to conclude certainly covid19 is a boom for rural marketing.

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STUDY ON CHALLENGES AND DEVELOPING A SUCCESSFUL PPP SCENARIO IN INDIA

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India is a developed world with rapidly developing infrastructure. The infrastructure has to be established, which necessitates an injection of funds. The government is short of funds for long-term growth. Public-private partnerships are exploding all over the place. According to the Government of India, a Public Private Partnership (PPP) project is one that is focused on a long-term arrangement or concession deal between a government or regulatory authority on the one hand and a private sector corporation on the other, for the delivery of infrastructure services in exchange for user fees. In a Public-Private Partnership, the public entity identifies the results it requires from the initiative. The private sector is in charge of the project's planning, construction, execution, and maintenance, as well as meeting the public agency's production requirements. The challenges of designing a competitive PPP scenario in India are examined in this article.

STUDY ON SUCCESS AND MOTIVATIONAL FACTORS FOR ENTREPRENEURS IN MSMES

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For the past few years, the growth of entrepreneurship has been seen as a focus area in development policy in many countries, especially India. Paper, communications, engineering, electrical, textile and metal manufacturing, constructing, food processing, teaching, and artisanship are only a few of the small to medium-sized micro-enterprises that young entrepreneurs are involved in. Internationally, the MSME sector was regarded as the driving force behind economic growth. Given the increased demand on land and rising unemployment as a consequence of net population development, the need for strong growth in the MSME sector has assumed critical importance. The changing economy has provided favorable conditions for the area's manufacturing and economic development. More entrepreneurs are needed in the area to take advantage of new market opportunities and help micro, tiny, and medium-sized companies develop. The success and motivational factors for entrepreneurs in MSMEs are discussed in this article.

REVIEWED STUDY ON ASSISTIVE TECHNOLOGIES USAGE FOR VISUALLY IMPAIRED STUDENTS

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With the right instruction and basic visual assistance, children with any degree of visual disability will learn to read text. This will encourage them to enter regular schools and integrate into society, which would support them for the rest of their lives. Despite this, many visually disabled students are enrolled in blind schools and are only taught Braille. Rapid technical advancements in the ‘modern world’ necessitate a rethinking of technology used for personal and educational purposes. For disabled persons, technological advancements are important. Environmental progress has resulted in more comfortable housing, safer highways, and poison-avoidance environments, both of which have resulted in a substantial reduction in youth accident and disability. The AP, as well as the device and service provision associated with these items, are all included in AT. This paper examines recent research on the usage of Assistive Technology for visually disabled students.

DISEASE PREDICTION MODEL USING CLUSTERING CLASSIFICATION TECHNIQUES FOR DIABETES MODE IN DATA MINING: REVIEW PAPER.

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People are the most composite living beings on this globe. It is difficult to imagine how billions of minuscule parts, everyone with its own personality, cooperate in an arranged way for the benefit of the all-out being. A framework is an association of different organs masterminded together with the goal that they can complete complex capacities for the body. Body capacities are the physiological or mental elements of body frameworks. Endurance is the body's most significant desire and it relies upon the body's looking after homeostasis. Homeostasis is a circumstance of relative consistency of body's inner climate and it relies upon the body's doing numerous activities in an organized way constantly. Its significant activities or capacities are reacting to changes in the body's current circumstance, trading materials between the climate and cells, utilizing food sources, and incorporating the entirety of the body's assorted activities. In the event that there is any change in the homeostasis illnesses set in [1]. A sickness is an unusual circumstance influencing any piece of the body. Infections are generally grouped into transferable and non-transmittable illness.

USE OF YOGA AS A TOOL FOR BETTERMENT OF PHYSICAL AND MENTAL HEALTH OF SCHOOL CHILDREN

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As a matter of fact, yoga is a way of connecting a person to the greater community and to the global consciousness. While yoga has its roots in India, where it has been practiced for thousands of years. As we live in an age of information, it was important for this research to fill in any knowledge gaps concerning yoga's relationship to mental health issues. In terms of emotional and physical well-being, people who practiced yoga and those who did not were compared to each other. A randomized, double-blind, controlled trial examining the impact of a school yoga programme included qualitative observational research as well. Students were given surveys after completing a yearlong Yoga curriculum to gain feedback. A total of 500 kids between the ages of 9 and 15 were included in the research. Their parents had to sign a permission document before they could communicate with one other. This article summarizes the available evidence on the favorable benefits of yoga therapies on mental and physical health by focusing on review papers. Taking these studies together, it seems that yoga may have health advantages in a variety of areas, but additional study is required to prove this across the board.

MALWARE DETECTION AND ANALYSIS USING MACHINE LEARNING

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Malware is one of the biggest challenges to the modern environment and is continues to develop in volume and sophistication. Malware is intended to inflict harm to a device or network and is typically used to carry out illicit or unapproved operations that may be used to spy on or profit from financial capital. Incorporated computing networks such as Internet of Things (IoT) computers, medical devices, and environmental and industrial applications have also begun to suffer from ransom ware assaults. Many new forms of malware are difficult and all have the potential to alter code and behaviour. There must be a wider range of strategies used to cope with the variety of malware instead of depending on conventional security methods, typical utilizing signature-based technologies. The malware families' variants share traditional behavioural characteristics that are static or interactive. Static analysis generally applies to techniques for the study without conducting content of malicious data, while dynamic analysis takes into account behavioral dimensions of malicious files while conducting activities such as information stream detection, feature call surveillance, and dynamic binary instrumentation. Machine learning algorithms may use such static and behavioural instruments to model the changing configuration of modern malware so that more sophisticated, signature-based approaches cannot readily be used to identify malware assaults.

IOT BASED HEALTH CARE MONITORING SYSTEMS USING SYSTEMATIC LEARNING SYSTEMS

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Internet of things has been a consistent performer in the commercial market as well as the healthcare market, it has become a daily part of life for most of the current generation and there is no wonder to say that it will remain consistent with the generations to come. There might be multiple reasons for the IOT paradigm throughout its journey can be assumed to depend on the development in the fields of wearable sensor network (WSN), hardware industry, cognitive or machine learning and so forth. The national income is very strongly tied to national healthcare expenditure which can be significantly controlled with the usage of IOT use cases in healthcare. These research questions are addressed using a systematic literature review focusing on Cognitive learning i.e. systematic learning systems, IOT use cases and healthcare. The review will concentrate on the peer-reviewed scholarly publications and grey literature over the last decade to uncover the emerging applications of cognitive learning in IOT based healthcare.

SIMULTANEOUS QUANTIFICATION OF NEVIRAPINE, LAMIVUDINE AND ZIDOVUDINE IN TABLET DOSAGE FORMS BY GRADIENT RP-HPLC METHOD

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An accurate, sensitive, precise, rapid and isocratic reversed-phase HPLC, (RP-HPLC) method for simultaneous estimation of Nevirapine, Lamivudine and Zidovudine in the bulk drug and in Pharmaceutical fixed dosage forms has been developed and validated. The best separation was achieved on a 250 mm × 4.6 mm i.d., 5-µm particle size of Inertsil ODS 3V-RP C18 column with acetonitrile as the organic modifier and Dipotassium hydrogen phosphate [0.02M] in water with pH 2.5 adjusted with orthophosphoric acid (0.1% v/v) in the gradient mode of elution as mobile phase at a flow rate of 1.0 mL min^{-1}. UV detection was at 230 nm. Retention times were found to be 2.425 min. for Nevirapine, 8.196 min. for Lamivudine and 11.68 min for Zidovudine. Response was a linear function of concentration over the range of 20-240 mcg/mL for Nevirapine, 15-180 mcg/mL for Lamivudine and 30-360 mcg/mL Zidovudine with correlation coefficient of around 0.9998. The percentage assay Nevirapine, Lamivudine and Zidovudine were found 99.72, 99.52 and 99.64 respectively. The limit of detection (LOD) for Nevirapine, Lamivudine and Zidovudine were found to be 0.02 µg/mL, 0.1 µg/mL and 0.15 µg/mL respectively. The limit of quantification (LOQ) for Nevirapine, Lamivudine and Zidovudine were found to be 0.06 µg/mL, 0.3 µg/mL and 0.45 µg/mL respectively. The recipients present in the formulation did not interfere with the assay. The method is suitable for application in quality-control laboratories, because it is simple and rapid with good accuracy and precision.

NATURAL LANGUAGE PROCESSING METHODS ON BIG DATA TO ASSESS SENTIMENTAL TREND IN BUSINESS

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Business analytics rely heavily on information obtained from a variety of sources. Traditionally, doctors ask patients to fill out a questionnaire. This forms the basis for diagnosing the condition of social networks. However, users can access many data sources, including patient records, from a variety of media. Natural Language Processing (NLP) allows researchers to collect and analyse this data in order to understand the basic meaning of these scriptures. The amount of sentiment analysis applied to many other areas is highly dependent on the techniques used in NLP. This paper describes the various general theories underlying the NLP discipline and the methods that can be used to gather user feedback from e media. These emotions can be removed over a period of time to minimize errors due to data entry and other stressors. It also describes some uses of sentiment analysis and how to apply NLP to business.

SYNTHESIS, CHARACTERIZATION AND ANTIMICROBIAL EVALUATION OF NOVEL BENZIMIDAZOLE-THIOSEMICARBAZONE HYBRIDS

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Background: Benzimidazole is a renowned N-based heterocyclic moiety that influenced the researchers to descry variant pharmacologically active lead molecules in drug discovery through structural and combinatorial chemistry. Method: Extended literature avowed the indisputable antimicrobial properties of thiosemicarbazones that stimulated us to the current exploration for the synthesis of novelbenzimidazole-thiosemicarbazone(5a-c)hybridsfrom the condensationof corresponding 4-substituted-O-phenylenediamines (1a-c)with 2-hydroxy acetic acid (2)to 1-(substituted-1H-benzimidazol-yl) methanol(3a-c)that are oxidizedusing green and advanced TEMPO/co-oxidant system to the corresponding aldehydes(4a-c) followed by the condensation with various thiosemicarbazides. Results: Fifteen novel benzimidazole-thiosemicarbazone(5a1-5- c1-5) were synthesized in adequate yields and characterization of the molecules was done by detailed spectral analysis using advanced analytical support. The titled compounds were screened for antibacterial and antifungal activities. Results proclaimed that all the synthesized compounds were exhibiting antimicrobial properties. Compound5b1 and 5b3were contended to bear potent antimicrobial properties against the given bacterial and fungal strains.

AN ANALYTICAL STUDY ON PHYSICAL AND FINANCIAL PERFORMANCE OF STATE ROAD TRANSPORT UNDERTAKINGS IN INDIA

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Abstract

A affordable and easy method of transportation for all social strata, it saves fuel and cuts down on traffic congestion as well. It is critical to the country's growth and social cohesion. The State Road Transport Undertakings (SRTUs) are one such method of public transportation in India (SRTUs). SRTUs rise to the top of the country's list of institutions. In order to properly serve the public, the health and efficiency of SRTUs are critical. Additionally, SRTUs provide discounted services, such as free or discounted bus tickets for students and police/jail staff, as well as discounted fares for older people and the disabled. As SRTUs have a significant social and economic impact on Punjab, the state with the greatest road connectivity in India, this research examines the current situation of SRTUs. This research compares the 19-20 financial year's physical and financial performance of India's 56 reporting State Road Transport Undertakings to the previous year's performance.

Keywords: Physical performance, financial performance, State Road Transport Undertakings, India, etc.

Introduction

Cities in developing nations are seeing an unprecedented surge in demand for mobility services, which has placed enormous strain on urban transportation infrastructure and services. Several budgetary and structural restrictions have made it difficult to increase the supply of public transportation services, and as a result, these services have fallen short of meeting the requirements of the metropolitan population. When it comes to developing countries, India isn't any different. Only 65 of the 7935 cities and towns in the United States with a population of 377 million or more (as of 2011) have government-provided public transportation, such as buses and trains. Almost everywhere else in the nation, people must rely on non-motorized transportation, personal automobiles, and unofficial public transportation to get about. There is a growing dependency on personal mobility alternatives and informal public transportation services to satisfy the mobility demands of the people in many places, even when public transportation is present. As a means of transporting people from one location to another, public road transportation is critical to the growth of the country's economy. The State Transport Undertakings provide this service (STUs). As a result of the industry's prominence, STUs throughout the nation were subjected to performance audits on a horizontal scale. An all-India picture is now possible thanks to this Compendium of findings from audits conducted by the Commercial States Wing, which was published in the States Audit Reports. The best and worst performing STUs under different operating factors, as well as all India averages, have been provided in order to emphasize the challenges involved.

The Roadways

There is relatively little information available on the financial performance and financial needs of private sector passenger road transportation. The Central Institute of Road Transport, Pune, India, regularly monitors the performance of State Road Transport Undertakings in India when it comes to Public Passenger Road Transportation. On the basis of this Institute's performance picture, the total fixed assets of State Transport Undertakings as of 31.03.97 are estimated to be in the range of Rs.61.00 billion. Long-term funds of Rs.39.34 billion are utilized to finance fixed assets, while short-term funds of Rs.21.67 billion are also employed. This is not a wise use of money. For the time being, around 38 percent of fixed assets are financed by government capital, while long-term loans make up 12 percent. Debentures (2%), the Industrial Development Bank of India under the bills discounting programme (35%), the Life Insurance Corporation of India's plan distribution of loans (30%), and Commercial Bank Loans (5%) comprise the long-term loans (33 percent).

Funding Options Available For Land Passenger Transport in India

It is also possible to raise revenue by charging passengers when new or improved services are introduced. Taxes on non-users who gain from the development and upgrading of transportation options are justifiable in addition to surcharges for users. Taxes such as pay roll tax, an additional charge on private car road tax and a surcharge on property tax may all be imposed as a sort of levy. Indian land passenger transportation is regarded as public utility because of its high initial capital investment and critical service to the common man. It is imperative that the federal and state governments, as well as the local municipalities, step up to fulfill the financial needs, since private money is unlikely to be attracted to such long-term infrastructure projects in a developing nation.

An effective institutional structure with a widespread commitment to execute is required for any of the financial possibilities to generate new resources. To plan and implement capital-intensive projects in both highways and railways, integrated transportation planning is needed. It is critical that transportation plans be developed in concert and that the accompanying infrastructure projects be implemented. Commercial land development by railroads and roads may also provide substantial money for capital finance. Commercial exploitation of railway land alone is anticipated to produce $400 million in revenue. A major source of financing for future passenger transportation projects and the sustainability of the

current system is fare box income. According to the rise in input prices, the passenger fee should be able to be changed on a regular basis. Commercial exploitation of railroads and road transportation is necessary to complement this fare box earnings, as noted before. As a result, such infrastructure projects need to be enticing to private investors via various options, such as BOOT (Build Own Transfer), BOT (Build, Operate, and Transfer), etc. In order to get the project off the ground, any necessary changes to the Industrial Policy Resolution and other laws will have to be enacted. It is possible to change the Railways Act to enable private company to run commercial services on the BOOT concept and to establish the passenger prices on commercial lines without obtaining prior permission from the Government. Projects funded by the BOOT programme will also be eligible for a number of tax and financial incentives. In all BOOT projects, the risk of depreciation of the Indian rupee in relation to foreign currency borrowings must be taken into account in the project cost.
It is necessary to draw on the equity contributions of various sectors to finance passenger rail and road transportation projects. Promoters, governments, contractors constructing projects and providing equipment, developers of real estate, and private investors like Indian banks and other financial institutions will all contribute to this effort in various ways. When sponsored by the government, public offerings for capital projects may also garner a solid response from Indian investors.

Debt financing must be explored, even if it is restricted. These restrictions are a result of the lack of a successful track record, the absence of marketable assets during the development phase, and the significant initial risk associated with recruiting senior lenders such as the World Bank and the Asian Development Bank (ADB). The Indian setting necessitates the selection of debt instruments that qualify for tax exemptions. Debt securities, such as Deep Discount Bonds, may be sold to the general public with large tax advantages.

The participation and cooperation of both the federal and state governments is crucial for any form of financing initiative. The bulk of this assistance will come in the form of expedited completion of the many processes and formalities that must be completed before a BOOT project can begin. This kind of project must be classified as a matter of national significance by the government, and every concession and amenity feasible must be made available.

Historical evolution of State Road Transport Undertakings in India

Prior to the Road Transport Corporation Act (RTCA) of 1950, India's road passengers were transported by private operators. "Even if private operators were first thought to be competent, it became commonly accepted that the services supplied by the government were superior." Thus, the RTCA of 1950 allowed the State Transport Corporations to exert monopolistic control over major market sectors, rising several times over the following three decades and accounting for approximately 55% of the entire bus market. Politicization of the STUs that arose led to a rise in prices, as they were increasingly exploited to generate jobs and provide support for special interest organisations. Motor Vehicle Act of 1988 liberalised access into the private sector, which changed policy direction. Following the passage of the Motor Vehicle Act of 1988, the system for issuing permits was liberalised and the reserve of stage permits for State Transport Corporations was eliminated in 1994 by means of an amendment. While several states in eastern India depend on private operators, their proportion of the Indian bus fleet has dropped to only 8 percent, making the STUs less and less important. Only in the past ten years has formal bus contracting begun to take hold in India, and it's only now beginning to spread.

Growth of the Public Sector in Passenger Bus Transport

The growth of the public sector in passenger bus transport as evidenced over the years is given in the table below:

Table 1: Growth of SRTUs

Indicators	2019-20	2018-19	2017-18	2016-17	2015-16
STUs Number	62(56) *	47*	54	52	63
Number of Buses held	1,49,095	1,42,855	1,35,000	1,31,000	1,15,000
Total Employment (lakhs)	7.4	7.6	7.0	7.0	7.4
Passenger kilometers per unit of labour			773	831	587
Passenger traffic handled (Billion passenger kms BPKm)	566	570	541	582	434
% of total buses in the country	8	8	7	8	18

Source: Profile and performance of STUs, CIRT: various publications *: Number of SRTUs examined in the Report

Physical & Financial Performance of SRTUS

5.1 Combined Physical performance of SRTU's
The combined physical performance of the reporting 56 SRTU's during 2018-19and 2019-20is summarized in Table 2.

Table 2: Combined physical performance of 56 SRTU's - 2015-16 & 2016-17

Item	2019-20	2018-19	% Age increase /decrease
Fleet Operated (Number)	1,33,770	1,32,753	0.77
Fleet Held (Number)	1,49,095	1,47,348	1.19
Passenger km Offered (in Crore)	81,88 6	81,740	0.18
Fleet Utilisation (%)	89.72	90.09	-0.41
Occupancy Ratio (%)	69.13	69.79	-0.95
Passenger km Performed (in Crore)	56,605	57,04 7	-0.77
Staff/Bus Ratio	4.97	5.14	-3.31
Staff Strength (Number)	7,40,831	7,57,161	-2.16
Vehicle Productivity (bus-kms/Bus/Day)	306.84	306.53	0.10
Staff Productivity (bus- kms/Staff/Day)	61.75	59.65	3.52

According to the 56 reported SRTUs, the number of 1,49,095 buses registered a 1.19 percent rise over the previous year. Fleet utilisation declined from 90.09 percent to 89.72 percent in

2019-20, indicating an increase in downtime for buses, even as the number of buses rose. There has been a 2.16 percent fall in staff strength, with the staff/bus ratio decreasing from 5.14 to 4.97 in 2019-20. Over the previous year, productivity among employees increased by 3.52 percent.

5.2 Combined Financial Performance of 56 SRTU's

The combined financial performance of the 56 reporting SRTU's during 2018-19and 2019-20 is summarized in Table 3.

Table 3: Combined financial performance of 56 SRTU's - 2015-16 & 2016-17

Item	**2019-20**	**2018-19**	**% Age increase /decrease**
Total Loss (Rs. in crore)	-13,956.76	-11,256.28	23.99
Total Revenue (Rs. in crore)	55,821.95	54,747.69	1.96
traffic earnings as % age of Total Revenue	81.02	82.25	
of which total traffic earnings	45,226.91	45,032.60	0.43
Total cost (Rs. in crore)	69,778.71	66,003.96	5.72
Staff cost as % age of Total cost	44.58	44.41	
of which staff cost	31,109.86	29,312.54	6.13

There was a 1.96 percent rise in the overall income of the 56 reporting SRTUs from Rs 54,747.69 crore in 2018-19 to Rs 55,821.95 crore in 2019-20. Between 2018-19 and 2019-20, there was an overall 5.72 percent rise in the aggregate total cost of the 56 reported SRTU's. At Rs.13956.77 crore in 2019-20, the cumulative net loss of the 56 SRTUs was 24 percent more than in the previous year.

Conclusion

Because rate increases have not kept pace with rising expenditures, it is clear that the costs of loss producing SRTUs are substantially larger than their revenues. In addition, private bus companies compete with public bus companies, and the government mandates that public buses run on routes that aren't profitable. "In order to cross-subsidize their operations, SRTUs need route simplification on a constant basis." For better fleet performance, vehicle technology must be improved and the fleet makeup must be changed by purchasing/hiring buses. The revenue and cost structure of SRTUs, as well as the physical and operational efficiency characteristics underpinning each SRTU, determines SRTU profits and losses. Physical characteristics that influence the performance of SRTUs include the size of the fleet, its vintage, the fraction of overaged fleet, the strength of the workforce, and more.

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EFFECT OF PARENT CONCRETE ON THE PERFORMANCE OF RECYCLED AGGREGATE CONCRETE: NOVEL APPROACH

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Concrete is essential for any infrastructure advancement. One of the genuine problem cracks in concrete, which is going to diminish the concrete life. To support development activities, it is basic to discover options into the self- healing of cracks. On the contrary side, the rate of maintenance is increasing step by step, while the issue of serviceability and safety is also extending a direct result of the life of humans at risk. India is one of the main producers of concrete in the world and huge amounts of repairing work were created. In the substitution of conventional repairing technique, the self-healing through bacteria can be used. Plus, calcium lactate (calcium sources) in concrete also may be used. The present investigation completed the work on concrete generation utilizing bacteria Bacillus Substilis and calcium lactate The usage of nonureolytic bacteria in the improvement of infrastructure holds a high ability to diminish environmental pollution. This can add to the financial generation of concrete and simultaneously help lessens the issue of maintenance work. This experimental investigation is taken up to explore the possibility of adding bacteria (Bacillus Subtilis) and calcium lactate also utilized in concrete. The study is conducted into two phases. The initial phase aims to investigate the effect of compressive strength, flexural strength, setting time, and workability due to the utilization of bacteria (Bacillus Subtilis) and calcium lactate. The subsequent phase aims to find out the self- healing of cracks in which bacteria utilized in different percentages, of cement content, up to 0.60%.

A STUDY ON MENTAL HEALTH OF THE SECONDARY SCHOOL STUDENTS IN RELATION TO THEIR FAMILY ENVIRONMENT, CLASSROOM CLIMATE AND LEARNING STYLES

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Learning is among the most crucial human things that are beneficial in development of individual's external and internal potentials. Education opens the door of advancement of intellectual, social, spiritual, cultural civilization and modernization. In other words it's a great key of all round development of specific and thereby nation. Highly knowledgeable people of every nation are property for national development. What this means is that quality education is crucial for higher advancement of any nation. Quality of education is normally assessed on the foundation of academic achievement or academic performance of pupils. Academic achievement can serve as a major criterion to be able to determine student's true capabilities and potentials. It's directly regarding condition of individual along with society and thus there by tax revenues of central government and state of the nation. Due to value of academic achievement of citizen, every nation of the planet would like to create the educational program of theirs and therefore educational quality of people. Schools are place of structured and formal training system. Every school wants that its pupils really should do their best to discover what they're expected to find out

INVESTIGATION OF ANTIOXIDANT AND ANTIMICROBIAL ACTIVITY OF BARK EXTRACT OF MUNTINGIA CALABURA

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Abstract

Bioactive compound found in medicinal plants are used to treat a variety of human ailments and serve a vital part in healing. M. calabura L. is a species of Muntingia. (M. calabura, Elaeocarpaceae) has long been utilized to treat a variety of pain-related issues. The goal of this study is to investigate at the phytochemicals, antioxidants, and antibacterial capabilities of M. calabura bark. By using the soxhletion extraction, the dried bark of M. calabura was successively extracted with n-hexane, ethyl acetate, and methanol solvents and the solvents from the extracts were evaporated under vacuum. The well-known test procedure was used to determine the qualitative analysis of various phytochemical elements as well as the quantitative analysis of total phenolic, flavonoids, and alkaloid content. The antioxidant activity of ethyl acetate and methanolic extracts bark was measured in vitro using the DPPH (2,2-diphenyl-1-picrylhydrazyl) model. The presence of numerous phytoconstituents in each extract was discovered through preliminary phytochemical analysis. To determine antimicrobial activity, a well diffusion method was used to test an ethyl acetate extract of M. calabura (bark) against three different strains, and it showed considerable inhibitory action against all of them. The present study concluded that the all the bark of M. calabura is a rich source of secondary phytoconstituents which impart significant antioxidant potential. The findings of the present study will be helpful to phytochemists, pharmacologists and pharmaceutical industries.

KEYWORDS: Antioxidant activity, antimicrobial study, Medicinal plants, Muntingia calabura, Phytochemical.

Introduction

Currently, the focus of study has shifted to finding novel natural antioxidants, particularly those derived from plants. Plants have always been a rich source of medicines, and there has lately been a lot of focus on developing novel therapeutic molecules based on medicinal plants. Medicinal plants are now preferred above pharmaceutical medications by many people [1]. Antioxidants are important because they may reduce oxidative stress, which is one of the factors that can harm biological molecules [2].

M. calabura belongs to the Elaeocarpaceae family, and it is a Philippine medicinal plant that is extensively dispersed over the world. M. calabura is also known in Latin America as the Jamaican Cherry Tree and as the capulin or capuli. M. calabura was grown in gardens and along the roadside in Southern Taiwan for both culinary and aesthetic uses. Medicinal applications for several portions of the M. calabura plant have been recorded. Flowers can be used as an antibacterial and to relieve stomach pains in traditional medicine.
The infusion of the leaves can be consumed as a tea-like beverage. It may be used to cure a cold as well as a headache. Because the fruit is delicious, it is commonly consumed by youngsters. It may also be baked into tarts or turned into jam. M. calabura has nutritional value, and a number of flavonoids and phenolic chemicals have been extracted from various parts of the plant, with spectroscopic studies elucidating their structures. M. calabura leaves

may contain antibacterial [3]. The cytotoxic effects of 8-hydroxy-7, 3, 4, 5-tetramethoxyflavone and 8, 4-dihydroxy-7, 3, 5-trimethoxyflavone were tested against A549 and HT-29 cells, respectively [4, 5], free radical scavenging [6], antinociceptive, antipyretic, anti-inflammatory [7], and anti-staphylococcal [8] properties. Internal Hg movement was possible, soil contamination was reduced and fruits may be utilised as a carbon source for glutamic acids [9]. The goal of this study was to conduct phytochemical screening and establish the relationship between total phenolic content and antioxidant activity of various solvent extracts from M. calabura bark using the DPPH test.

Materials and Methods

Plant material

The plant M. calabura was collected from B. R. Nahata College of Pharmacy, Mandsaur (M.P.) in the month of November, 2019 and was identified and authenticated from Department of Botany, Career College Bhopal, under voucher specimen number Bot./2019020. The bark sample were separated and washed with sterile distilled water to remove the adhering dust particles and other unwanted materials. The bark was air dried under room temperature. The dried plant samples were cut and grinded to make it in powder form and pass through 30 mesh SS screen fitted. The powdered samples were stored in clean, dry and sterile container for further use.

Chemical reagents

All the chemicals used in this study were obtained from Hi Media Laboratories Pvt. Ltd. Mumbai, India), SD Fine- Chem. Ltd. (Mumbai, India) and SRL Pvt. Ltd. (Mumbai, India).All the chemicals used in this study were of analytical grade. Quercetin and gallic acid was kindly provided by Scan Research Laboratories, Bhopal (India).

Extraction of plant material

For the extraction of extract from shade dried and powdered bark, the following process was used.

Extraction by Soxhletion Method

The soxhletion technique was used to extract 52.8 gram of powdered M. calabura bark using several solvents (n-hexane, ethyl acetate, and methanol). The extracts were evaporated at temperatures higher than their boiling points. Finally, the dried extracts' % yields were determined.

Qualitative phytochemical analysis of plant extract

The preliminary phytochemical examination of the M. calabura bark extract was performed using established procedures [10]. The extract was examined for phenolic chemicals, carbohydrates, flavonoids, glycosides, saponins, alkaloids, lipids or fixed oils, protein and amino acids, and tannins, among other active principles.

Total phenol determination

Parkhe et al [11] developed a technique for determining total phenolic content. 1 ml Folin Ciocalteau reagent (previously diluted with distilled water 1:10 v/v) and 1 ml (7.5g/l) sodium carbonate were combined with 2 ml extracts or standards. The mixture was allowed to sit at room temperature for 15 minutes. A UV/visible spectrophotometer were used to measure the colour generated at 765 nm. The total phenolic content was determined using the gallic acid standard graph, and the findings were represented in milligram per 100 milligram of gallic acid.

Total flavonoids determination

Parkhe et al [11] developed a technique for determining total flavonoid content. 1 mL of 2% AlCl3 methanolic solution was added to 3 mL of each extract or standard and allowed to stand at room temperature for 15 minutes; the absorbance of the reaction mixture was measured at 420 nm with a UV/visible spectrophotometer. The flavonoid content was determined using a standard graph of quercetin and represented as quercetin equivalent (mg/100mg).

Total alkaloids content estimation

The extract (1 mg) was diluted in methanol, then filtered after adding 1 ml of 2 N HCl. 5 ml of bromocresol green solution and 5 ml of phosphate buffer were added to this solution in a separating funnel. The mixture was vigorously agitated with 1, 2, 3, and 4 mL chloroform before being collected in a 10-mL volumetric flask and chloroform diluted to volume. The same procedure was used to generate a series of atropine reference standard solutions (40, 60, 80, 100, and 120 g/ml). An UV/Visible spectrophotometer was used to measure the absorbance of the test and standard solutions against the reagent blank at 470 nm. The total alkaloid concentration was measured in milligram of AE per 100 milligram of extract.

Antioxidant activity

DPPH free radical scavenging assay

The activity of DPPH scavenging was determined using a modified technique [12]. The spectrophotometer was used to test the DPPH scavenging activity. The stock solution (6 mg in 100 mL methanol) was produced to give an initial absorbance of 1.5 mL in 1.5 mL methanol. After 15 minutes, there was a decrease in absorbance in the presence of sample extract at various concentrations (10-100 g/ml). 1.5 ml of DPPH and 1.5 ml of varying concentrations of the test sample were placed in a succession of volumetric flasks, and the final volume was adjusted to 3 ml using methanol. Three test samples were collected and processed in the same way. Finally, the average was calculated. For each concentration, the absorbance at zero time was measured. After 15 minutes at 517 nm, the absorbance of DPPH with varied concentrations showed a final reduction. The following equation was used to compute the % inhibition of the free radical DPPH:

% inhibition = [(absorbance of control - absorbance of sample) / absorbance of control] × 100%.

IC50 was computed based on the proportion of DPPH radicals scavenged, even though the activity is represented as a 50 percent inhibitory concentration (IC50). The stronger the antioxidant activity, the lower the IC50 value.

Antimicrobial activity

Using the conventional protocol of Bauer et al., [13], the antibacterial activity of bark extracts produced from M. calabura was determined using the well diffusion method. Ciprofloxacin IP grade and fluconazole were employed in the normal preparation. Three gram positive bacteria, Streptococcus mutans, Bacillus subtilis, and Staphylococcus aureus, three gram negative bacteria, Salmonella bongori, Klebsiella pneumonia, and Escherichia coli, and three fungi, Aspergillus niger, Candida albicans and Aspergillus flavus, were used to test antimicrobial activity. In antibiogram investigations, three concentrations were used: 25, 50, and 100 mg/ml for extract. Its most important characteristic is the quick placement of wells containing antibiotics on the surfaces of agar following inoculation with the organism to be examined. Inoculums made from undiluted overnight broth cultures should never be utilised. After a 24-hour incubation period at 37°C, the plates were evaluated for obvious zones of inhibition surrounding the wells impregnated with a specific drug concentration. The diameter of each well's zone of inhibition was measured.

Results and Discussion

Table 1 shows the percentage yield of various extracts of M. calabura bark in n-hexane, ethyl acetate, and methanol, with yields of 2.36 percent, 5.21 percent, and 6.45 percent, respectively.
Table 2 shows the results of phytochemical screening of sequentially extracted M. calabura bark extracts. The phytochemical screening findings revealed that the phytochemical makeup of various solvents was mainly comparable (n- Hexane, ethyl acetate, and methanol). However, physiological and biosynthetic activities occurring inside the plant are responsible for the lack of certain phytochemicals in one area of the plant sample and their presence in another.

Table 3 summarizes the total flavonoid, phenolic, and alkaloid contents of M. calabura bark in n-hexane, ethyl acetate, and methanol. The total phenolic content in ethyl acetate and methanol bark extracts of M. calabura was determined to be 1.074 mg/100mg and 0.859 mg/100mg extract, respectively, according to quantitative analysis. Bark ethyl acetate extract had a total alkaloid concentration of 0.694 mg/100 mg. Table 4 shows the concentrations of ethyl acetate and methanol extracts of different sections of M. calabura required to block 50% of DPPH. Ethyl acetate extract and Methanol bark extract had variable DPPH activity, with 52.13 and 77.10 g/ml for ethyl acetate and methanol extract, respectively. M. calabura bark was tested for antibacterial efficacy against sensitive microorganisms in this study.

Fresh pure 100 percent extracts were produced from chosen plants and diluted to concentrations of 100, 50, and 25 mg/ml before being delivered to the sensitive organism through the agar well diffusion technique. The experiment's findings were summarized in tables 5 and 6, which clearly demonstrated the antimicrobial activity of M. calabura extracts.

Table 1: % Yield (W/W) of M. calabura

S. No.	Extract	% Yield bark extract
1.	n- Hexane	2.36
2.	Ethyl acetate	5.21
3.	Methanol	6.45

Table 2: Result of phytochemical screening of M. calabura (Bark)

S. No.	Constituents	n- Hexane extract	Ethyl acetate extract	Methanol extract
1.	**Alkaloids** Hager's Test:	-ve	+ve	-ve
2.	**Glycosides** Legal's Test:	-ve	-ve	-ve
3.	**Flavonoids** Lead acetate Test:	+ve	+ve	+ve
4.	**Diterpenes** Copper acetate Test:	-ve	-ve	+ve
5.	**Phenol** Ferric Chloride Test:	-ve	+ve	+ve
6.	**Proteins** Xanthoproteic Test:	-ve	+ve	+ve
7.	**Carbohydrate** Fehling's Test:	-ve	+ve	+ve
8.	**Saponins** Froth Test:	-ve	+ve	+ve

Table 3: Estimation of total Phenol, flavonoids and alkaloid content of M. calabura bark extract

Extract	Total phenol content (mg/ 100 mg of dried extract)	Total flavonoids content (mg/ 100 mg of dried extract)	total alkaloid content (mg/ 100 mg of dried extract)
n- Hexane	-	0.456	-
Ethyl acetate	1.074	0.947	0.694
Methanol	0.859	0.725	-

Table 4: % Inhibition of ascorbic acid and bark extract of M. calabura using DPPH method

% Inhibition (Bark)

		% Inhibition (Bark)		
1	10	44.65	26.85	18.45
2	20	48.62	39.51	21.68
3	40	65.34	47.49	34.22
4	60	69.65	54.66	41.43
5	80	77.41	61.75	51.47
6	100	84.13	68.64	60.59
IC 50		17.68	52.13	77.10

Table 5: Results of sensitivity of ethyl acetate bark extract of M. calabura

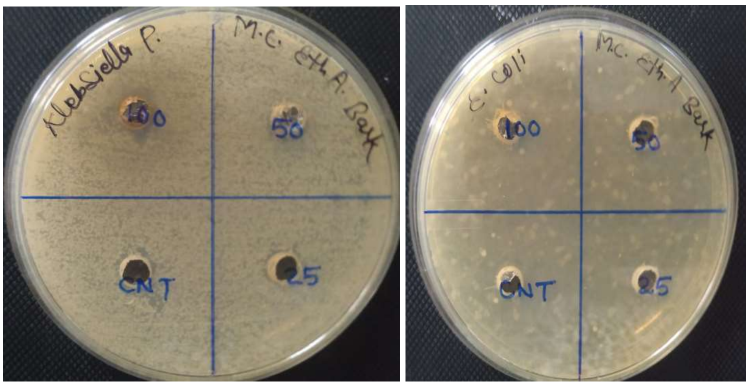
S. No.	Microbes Codes	Microbes	Bark extract
1.	Bact-1	Streptococcus mutans	No
2.	Bact-2	Bacillus subtilis	No
3.	Bact-3	Staphylococcus aureus	No
4.	Bact-4	Salmonella bongori	No
5.	Bact-5	Klebsiella pneumoniae	Yes
6.	Bact-6	Escherichia coli	Yes
7.	Fungus-1	Aspergillus niger	No
8.	Fungus-2	Candida albicans	Yes
9.	Fungus-3	Aspergillus flavus	No

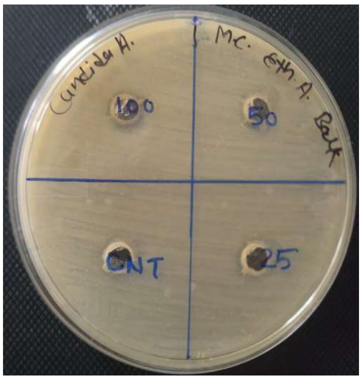
Table 6: Antimicrobial activity of bark ethyl acetate extract of M. calabura against selected microbes

S. No.	Name of microbes	Zone of inhibition		
		Bark ethyl acetate extract		
		25mg/ml	50 mg/ml	100mg/ml
1.	Klebsiella pneumoniae	8±0.25	10±0.20	11±0.25
2.	Escherichia coli	8±0.10	9±0.14	11±0.25
3.	Candida albicans	6±0.15	7±0.22	8±0.32

Photoplates of antimicrobial activity of bark ethyl acetate extract of M. calabura against selected microbes

Figure 1: Photoplates of antimicrobial activity of bark ethyl acetate extract of M. calabura against selected microbes





Conclusion

The antibacterial and antioxidant capabilities of M. calabura bark may be extrapolated from the given results. These qualities are due to a range of phytochemicals found in this plant extract, including alkaloids, phenols, flavonoids, and diterpines. The ethyl acetate extract has a good antibacterial and antifungal activity against the microorganisms tested. In methanol extracts, the plant showed excellent antioxidant activity. The significant antioxidant activity of the extract shows that ethyl acetate bark extracts might be employed as a natural antioxidant source. More study is needed to understand the mechanisms behind these plant extract activities, which, based on our findings, might open up a new window in the hunt for novel bioactive drug lead components in these plant extracts.

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FORECASTING STOCK MARKET RETURNS USING ARTIFICIAL NEURAL NETWORKS

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Abstract

A stock market is an inventory and derivatives trading platform at a negotiated price. The stock market is driven by supply and demand of shares. One of the most developing industries is in every nation stock market. Predicting and analyzing stock market data is an important part of today's economy. The prediction of stock performance is one of the most difficult problems in time series data analysis. The stock market process is clearly quite unpredictable, therefore it is greatly influenced by various variables. This has become a major undertaking in business and finance. There are numerous kinds of algorithms used to predict/foresee. Machine learning algorithms have been extensively utilized in recent decades to forecast financial time series. Although automated trading systems using artificial intelligence (AI) have become a popular subject, few instances utilize the established technique developed for the building of automatic trading systems by traders in stocks. This article examines stock market returns using artificial neural networks.

Keywords: Forecasting Stock, Market Returns, Artificial Neural Networks, Machine Learning, etc.

Introduction

Predictability of stock returns is one of investors' most significant concerns. Many writers try to explain the cross-section of inventory returns, utilizing different variables such as the income-price relationship, business size and inventory price momentum and the effectiveness of these components. Conversely, investors themselves must determine how returns may be processed and forecast, including selection and weighting of these variables. Many individuals now have an indirect or direct connection to this industry. Knowing market trends is thus important. Thus, individuals are interested in predicting stock price with the growth of the stock market. However, given the dynamic nature and the ability to alter stock prices rapidly, the forecast of the stock price is a difficult job. Most stock markets are a non-parametric, non-linear, noisy and determinist system of chaos.

As the technology increases, stock traders are using intelligent trading systems rather than fundamental analyzes to forecast stock prices to enable them take quick investments. One of the traders' primary objectives is to anticipate the stock price so that they may sell it or purchase the stock before the price increases. The efficient market hypothesis says that stock prices cannot be predicted and stocks act at random. The expertise of an experienced trader for forecasting the stock price appears to be extremely tough to replace. However, with a considerable number of data and technical advances available, we can now develop a suitable prediction algorithm, whose findings may enhance profits for traders or investment companies.
The accuracy of an algorithm is thus directly proportional to the benefits that the program makes. During the last several decades, price swings have been predicted for stock markets via different artificial intelligence techniques.

According to the effective market theory, stock prices are quickly adjusted to new information as it becomes public knowledge, such that stock market movements cannot be predicted. However, a great deal of research is now being undertaken on the application of neural networks to stock markets and points out that a forecasting of stock market shifts is feasible since future information is not efficient in past price changes in stock markets.

Artificial Neural Network for Stock Market Results Prediction

The Artificial Neural Network is a method which has been extensively investigated and used for applications in engineering and scientific areas for different objectives, from control systems to artificial intelligence. Its generalizing capabilities have attracted not just praise from the engineering and scientific disciplines, but also interest in the implementation of ANN by finance scholars and practitioners over recent years. "The three areas that are extensively explored in the fields of finances are bankruptcy prediction, debt risk assessment and security market applications." The findings have been positive, since ANN has greater generalization capability than traditional statistical techniques or benchmarks.

With such extensive study and demonstrated ANN's capacity in the field of security market application and the increasing significance of the role of equities securities in Singapore, the project has encouraged the conceptual development in its use of ANN in stock selection. With its demonstrated generalization capacity, the ANN can deduce the features of the performing stocks from past trends. The success of stocks reflects their profitability and the quality of the underlying company's management. The ANN is therefore utilized as a tool to identify the complex links between stock performance and associated financial and technical factors.

Review of Literature

Qi & Zhang, (2008) investigated the best modeling of trend time series using Neural Network. They used four different approaches, i.e., raw data, raw data with a time index, de-trending and differencing for modeling various trend patterns and concluded Neural Network gives better results.

Artificial neural networks have been extensively utilized because of their varied character to resolve various issues. Yodele et al. (2012), proposed a hybrid technique to forecast future stock prices to enhance current approaches, i.e., a mixture of variables from fundamental and technical analysis of the stock market indicators; Y Kara & A Boyacioglu (2011) examined stock market price index movement utilizing two Artificial Neural Network and Vector Machine Support models (SVM). They evaluated the performance of the two models and found that the ANN models had a substantially superior average performance than the SVM model.

Prasaddas, and Padhy, (2012)Machine learning methods such as Artificial neural networks (ANNs), support vector regression (SVR), genetic algorithms (GA) and hybrid models were extensively utilized in recent decades to forecast financial time series. Moreover, the time series issue includes dynamic time-warping (DTW), which is frequent in the stock market and manages scaling and shifting. The newly established DTW Network is an algorithm contender for data processing in financial time series.

Dharmaraja Selvamuthu, Vineet Kumar and Abhishek Mishra (2019)The support vector machine (SVM), support vector regression (SVR) and back propagation network are the most popular methods for the predicting of time series (BPNN). In this post we utilize neural networks based on three distinct learning algorithms, namely: Levenberg-Marquardt, Scaled Conjugate Gradient and Bavarian Regularization for prediction on the stock market. All three methods offer 99.9 percent accuracy using tick data. The accuracy of the data collected during the next 15 minutes decreases to 96.2 percent, 97.0 percent, and 98.9 percent for LM, SCG and Bayesian regularization, respectively.

Research Methodology

This is the back-propagation network. BP network. It is a multi-layer forward network, learning via a minimal average square error. It may be used in the fields of linguistic integration, identification and adaption, etc.

The BP network is half-controlled learning. First of all, the artificial neural network must acquire a precise criteria for learning so that it works. Electronic Learning tips may be mentioned as follows. If the results of the network are incorrect, the network should scale down the probability of producing the same error next time via learning. This project utilizes data processing techniques to examine previous market share statistics to forecast the required values more correctly.

Algorithm:
Accept input sample

Perform its weighted summation.

Apply it to input layer neurons.

Process all inputs at each neuron by transfer function to get individual.

Hidden layer and repeat 1,2,3,4 steps pass it as an input to all neurons of for hidden layer neurons.

Pass output of hidden layer neurons to all output layers and repeat 1,2,3,4 steps to get final output.

Display the final output.

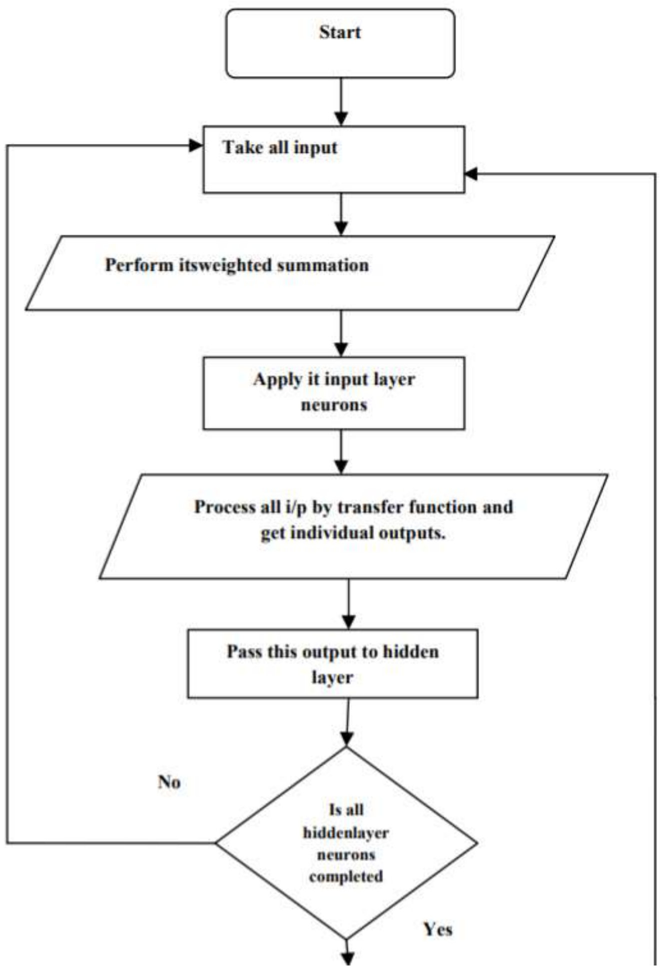

Figure 1: BP Algorithm Flowchart

Mathematical Model

Error calculation:

Calculating Root Mean Square,

Let RMS is denoted as Root Mean Square,

E is denoted as Error of difference between actual value and predicted value GE means Global Error.

E=√GE/size

Updating, error value,

GE+=Δ*Δ

Where, delta=expected value-actual value

Activation function:

Sigmoid

Result=1/(1+G^(-d))

Tan hyperbolic:

Result=e^d*2.0-1.0/e^d 2.0 +1.0

IV. RESULTS AND DISCUSSIONS

Testing was performed on different companies and results obtained were quite satisfactory. We are showing the Table of actual and predicted price results of companies. From the table prediction accuracy is good.

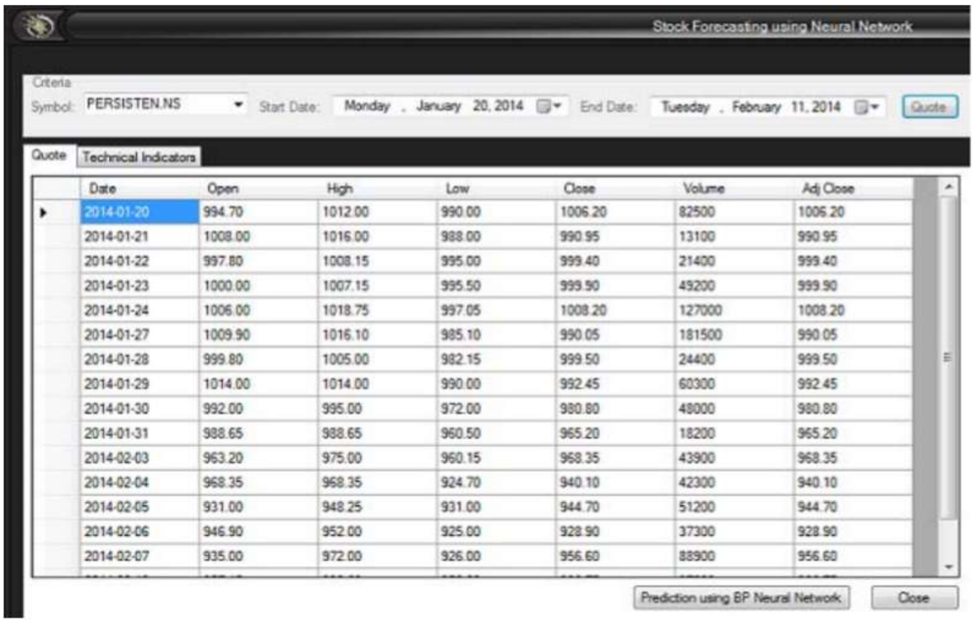

Figure 2: Showing the past stock price

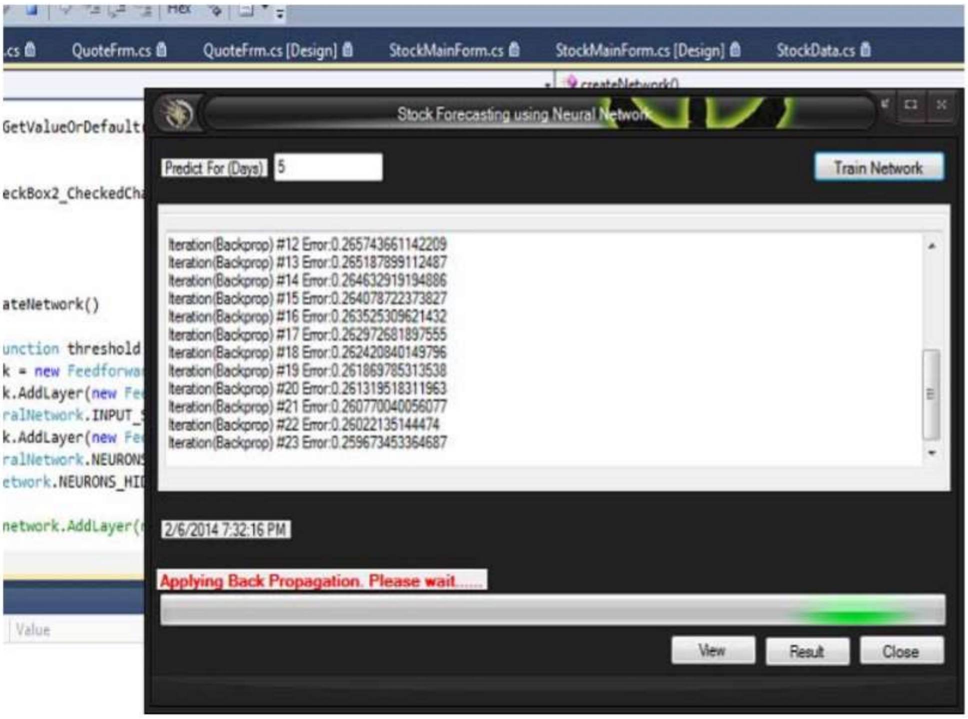

Figure 3: showing the process of algorithm

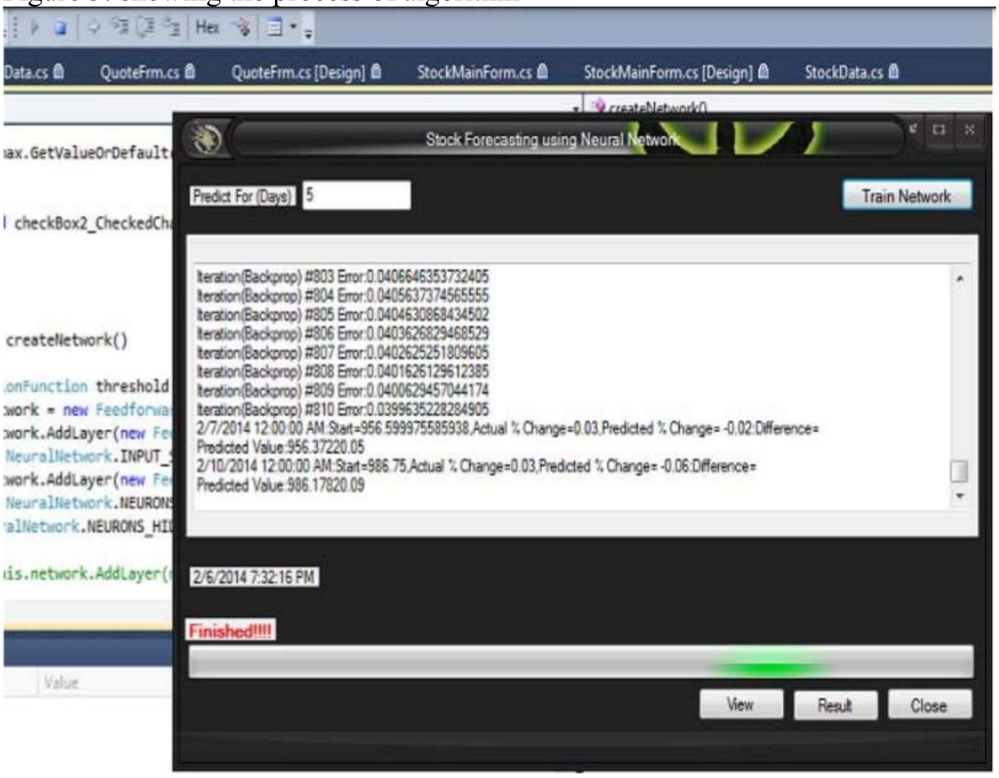

Figure 4: showing the actual price and predicted price

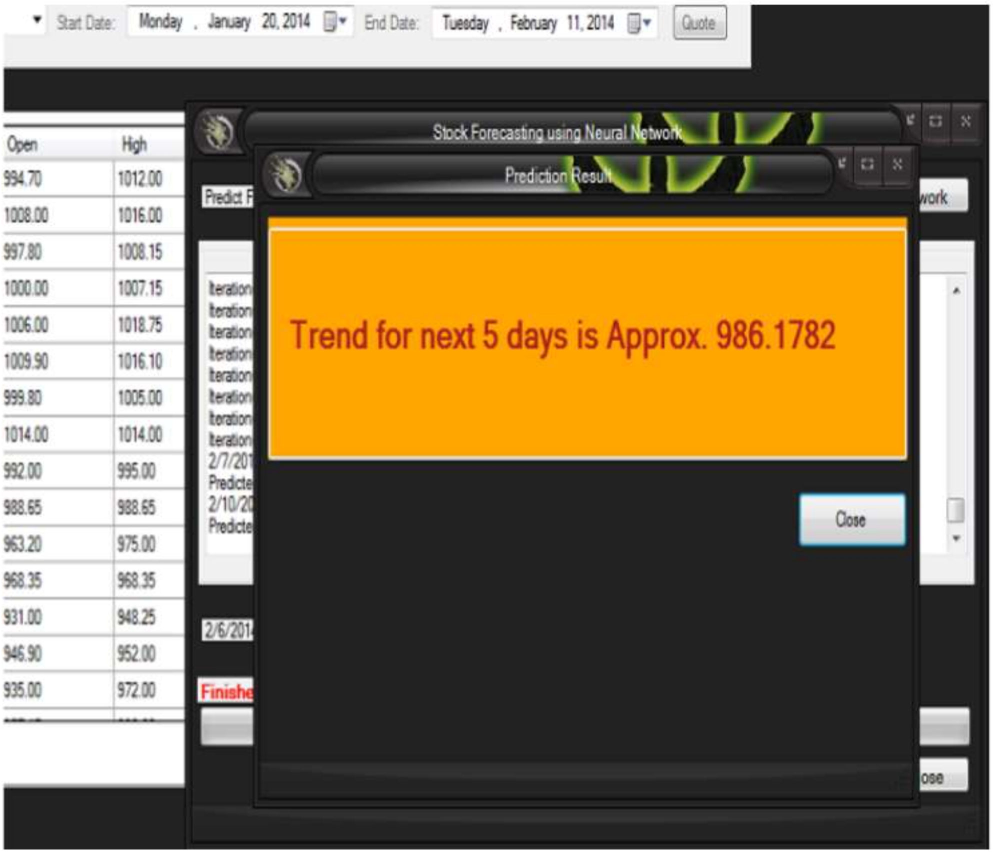

Figure 5: showing the Actual prediction result of next 5 days

Conclusion

The major difficulties in the stock market nowadays are predicting stock outcomes. The stock price data provides a time series of financial data that is harder to forecast owing to its dynamic features. A broad variety of difficult issues have been modeled using artificial intelligence systems such as artificial neural networks (ANN), Fuzzy inference system (FIS) and adaptive neuro-fuzzy inference system (ANFIS). "ANN shows higher prediction performance than traditional statistical techniques such as discriminatory analysis and logistic regression. In this article we attempted to summarize the use for stock market outcomes of the Artificial Neural Networks (ANN)." ANN have shown a high degree of accuracy in an effective and generic approach to pattern recognition, classification, grouping and, in particular, time series prediction. Their performance is nonetheless not always acceptable. Return propagation method is the ideal algorithm to employ in the feed forward neural network because it minimizes an error in gradual descent between the actual output and the intended output.

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MEASUREMENT OF REFRACTIVE INDEX OF MIXTURES OF LIQUID CRYSTAL

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Abstract

In case of liquid crystal mixture, we have studied thermo optical properties as a function of temperature. The main feature of optical phenomena in liquid crystal causes due to thermo optical and phase transition procedure. Thermal effect is similar as in other materials. While the phase transition is the characteristic property which we find in liquid crystalline phases. The nonlinearity occurs due the reorientation effect in case of nematic phase that results to many other effects also which are not observed in any other type of nonlinearity. It can easily modified either by external electric or by magnetic fields. The nonlinearity depends on polarization of light within a wide range. It is independent of wavelength of light. It has slow response time which could be fasten by special optimization of the system.

Introduction

In liquid crystal, order is very important which is affected by number of microscopic properties like magnetic susceptibility, dielectric constant, refractive index and viscosity etc. Different direction of polarized rays shows different refractive index. Many experimental setup shows the anisotropy of nematics which arises due to the tendency of the rod like molecules in the fluid to align their long axis which are parallel to the director. Here, the director is shown by the symbol n ̂; the rod shaped molecules are represented by the short lines [1-3].

The director lies along the Z-axis of fixed rectangular coordinate system. When all the molecules are completely aligned with n ̂ for all permissible value of angle φ = 0 and<Cos2θ> = 1. On the other hand, when the molecules are randomly distributed in all possible directions, all the values of φ are equally likely and <Cos2 θ> = ½.

In general, in any order – disorder problem, the order parameter is always taken asone in case of perfectly ordered phase and vanishes for completely disordered phase. Examination of the average data as given above indicates that the proper order data for the nematic sample is given as under

$$\langle P2\rangle = \tfrac{1}{2}(3\mathrm{Cos}2\ \theta - 1) \ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Obviously, <P2> = 0 for the disorder isotropic phase and <P2> = 1 for totally ordered nematic phase. The notation <P2> is used for the order parameter because we identify the particular combination in the equation (1) to be the second order Legendre polynomial, given as under,

$$P2\ (\mathrm{Cos}\ \theta) = \tfrac{1}{2}(3\mathrm{Cos}2\ \theta - 1)$$

In some cases, the symbol S is used in place of <P2>. The values of <P2> are between 0 and 1 which describes degrees of ordering intermediate between totally isotropic and ordered. It is the task of order-disorder to determine the temperature dependence of <P2> [3-8].

Birefringence in Liquid Crystals

It has been observed that liquid crystals are birefringent. It is because of their anisotropic nature. It means they show double refraction i.e. having two refractive indices. It is characterized by the difference of refractive indices for the ordinary and extraordinary rays. As we know the refractive index is the ratio of the light speed in vacuum to that in the material. In present case, the refractive index for the velocities of a wave travelling parallel to the director is given by $n_e = c/v_{ll}$ whereas the refractive index for the velocities of a wave travelling perpendicular to the director is given by $n_o = c/v_{\perp}$. The maximum value for the birefringence n = ne - no . The condition ne> no specifies a positive uniaxial material, hence that nematic liquid crystals lies in this category. For complex nematic crystals, the value of no is approximately 1.5 and the maximum difference of refractive indices (i.e. n) ranges between 0.05 to 0.5. The birefringence of liquid crystal mixture plays a significant role in twisted nematic (TN) mode. This parameter is much sensitive in multiplexed display units where it should be matched with thickness of the liquid crystal layer by the following relation :

$d. \Delta n = 2\lambda$

where λ is the wavelength of visible light in the range 0.4 to 0.7μm, d is the cell spacing.
The relation $d. \Delta n < 2\lambda$ leads to the color whereas the relation $d. \Delta n > 2\lambda$ leads to the narrow viewing angle mainly in multiplexed displays. Attempts have been made by many workers, to use low birefringence material and use the relation $d. \Delta n = \sqrt{(3\lambda/4)}$ for high level multiplexed displays. Normally for direct drive displays, matching is not very critically assured and relation $d. \Delta n \geq 2\lambda$.

Low birefringence materials having high positive dielectric anisotropy and order parameter are required for dye phase change type display unit [9].

Wavelength Dependent of Refractive Index

In normal dispersion, "The refractive index increases as the wavelength of the light decreases." It means the slope of the curve is greater at shorter wavelengths. Also we can say that the dispersion increases as the wavelength of the light used decreases. That's the region for the violet end of the spectrum by prism is spread out on a larger scale than the red end of the spectrum by the prism [10].

Measurement of Refractive Index : In the present paper, we are reporting the results of the measurements taken of extraordinary refractive index (ne), ordinary refractive index (no) in an isotropic phase of a liquid crystal sample E48 in terms of temperature by using Abbe refract meter by using a monochromatic light source. From the experimental data, we have calculated different useful parameters e.g. birefringence, normalized polarizabilities (α_e/α, α_o/α) and order parameter S [11-12].

Results and Discussions

Vuks gave a semi-empirical relation that relates the refractive indices and the molecular polarizabilities in case of anisotropic materials.

$$\frac{n_{e,o}^2-1}{\langle n^2\rangle+2}=\frac{4\pi}{3}N\alpha_{e,o} \quad \ldots\ldots\ldots\ldots\ldots (2)$$

Where no andneare the refractive indices for ordinary and extra ordinary ray respectively, $\alpha_{e,o}$ are the corresponding molecular polarizabilities and N is the number of molecules per unit volume, and $\langle n^2\rangle$ is given by the following relation :

$$\langle n^2\rangle = (n_e^2 + 2n_o^2)/3 \quad \ldots\ldots\ldots\ldots\ldots (3)$$

In equation(2), ne and noare coupled together such that the relation between the refractive indices and the corresponding molecular polarizabilities is not evident. To reveal this relationship, we should decouple ne from noby solving equation (2). Substituting the value of $\langle n2 \rangle$ fromequation (3)inequation (2) and separating ne and n0, we have

$$n_e = \left(1 + \frac{4\pi N\alpha_e}{1 - \frac{4\pi}{3} N\langle\alpha\rangle}\right)^{1/2} \ldots\ldots\ldots\ldots\ldots(4)$$

$$n_0 = \left(1 + \frac{4\pi N\alpha_e}{1 - \frac{4\pi}{3} N\langle\alpha\rangle}\right)^{1/2} \ldots\ldots\ldots\ldots\ldots(5)$$

Where $\langle\alpha\rangle$ is average polarizability of the liquid crystal molecules which is given by the following relation :

$$\langle\alpha\rangle = (\alpha_e + 2\alpha_0)/3$$

And birefringence of the liquid crystal sample is given by Δn=ne– no. Now by using above equation's we have the following relation :

$$\Delta n \approx \frac{\sqrt{2}\,\pi N S(y_e - y_0)}{1 - \frac{4}{3}\pi N\langle\alpha\rangle} \ldots\ldots\ldots\ldots(6)$$

However, the average refractive index $\langle n \rangle$ of liquid crystal is defined as

$$\langle n \rangle = (n_e + 2n_0)/3 \ldots\ldots\ldots\ldots (7)$$

On putting the values of the neand no in above equation, we drive

$$\langle n \rangle = \frac{3\sqrt{2}}{4} + \frac{\sqrt{2}\,\pi N\langle\alpha\rangle}{1 - \frac{4}{3}\pi N\langle\alpha\rangle} \ldots\ldots\ldots\ldots(8)$$

Putting the values of Δn fromequation (6) and that of $\langle n \rangle$ from equation (7) in equation (4)and(5), then the refractive indices have the following simple expression

$$n_e = \langle n \rangle + \frac{2}{3}\Delta n \ldots\ldots\ldots\ldots\ldots(9)$$

$$n_0 = \langle n \rangle - \frac{1}{3}\Delta n \ldots\ldots\ldots\ldots\ldots(10)$$

Order Parameter (Direct Extrapolation Method) :

The calculation of microscopic order parameter in the liquid crystal sample by optical birefringence's is done by using Vuks direct extrapolation method. The refractive indices ne and nohave been analyzed by the method of Haller and Horn, this method uses Vuks relation.

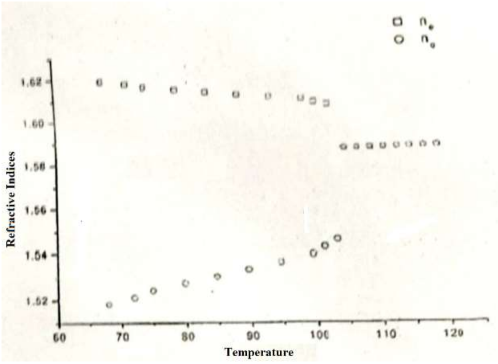
$$S(\delta\alpha/\alpha) = \frac{3(n_e^2 - n_o^2)}{(n_e^2 + 2n_o^2 - 3)} \ldots\ldots\ldots\ldots(11)$$

Here, $\delta\alpha(=\alpha_e - \alpha_1)$ is the anisotropy of polarizability and α is mean molecular polarizability.The logarithmic of the R.H.S. of above equation is plotted against log(T/TC) and the straight line so obtained is extrapolated to T=00K. The intercept at T=00K where S=1 led to the scaling factor $\delta\alpha/\alpha$ in equation (11), we can obtain the value of order parameter at various temperatures.

Figure shows, after clearing point the birefringence becomes zero. The ordinary refractive indices (no) increases slightly while the extraordinary refractive index decreases sharply with increases in temperature the SmA to isotropic point i.e. at 104°C refractive index values changes and becomes almost constant.

It is in accordance with the results obtained by others on different samples. The reason for this kind of behavior is due to birefringent nature of liquid crystal phase. As we increase the temperature, the molecular ordering decreases and this birefringent nature becomes less significant and after the isotropic temperature, the □n vanished and the sample behave like any ordinary organic liquid.

Figure : Variation of Refractive indices with temperature



Conclusion

Some liquid crystal phases are relatively recent discoveries and are more rarely encountered. Although such novel liquid crystal phases can usually be identified by optical microscopy accordingly, just as the field of liquid crystals draws on the expertise of scientists from many disciplines, the identification of mesophases requires a wide range of techniques to identify and classify fully the different structure of the various mesophases.

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INTEGRATED HYDROLOGICAL AND HYDROGEOLOGICAL STUDIES OF ARTIFICIAL RAINWATER HARVESTING STRUCTURES FOR AUGMENTATION OF GROUNDWATER IN NAGARKURNOOL DISTRICT, TELANGANA STATE, INDIA

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Among the natural resources, water is the most basic element in nature, next to air for sustenance of life and is essential for normal and healthy growth of life. Intensive use of natural resources and increasing global population also put a great pressure on water. For domestic supply purposes, the percent of groundwater use has increased to more than 40% on a worldwide basis. Several researchers throughout the world have carried out hydrological and hydro- geological studies in different areas and theories are developed . Nagarkurnool is a district in the southern region of the Indian state of Telangana. The annual rainfall is lowest and due to different rock types, the ground water is less. Out of total water resources, 90% of drinking and irrigation water is from groundwater resources in parts of Nagarkurnool district. Previously a very little work has been carried out in the present study area which is mostly under-developed region in the drought-prone part of the district. The main aim and objective of the present investigation is to explore the feasibility of groundwater resources with special emphasis on groundwater resources by applying all possible integrated methods like geological, geo-morphological and hydrological methods, with a view to suggest some constructive and practical harvesting methods for overall development and management of groundwater resources.

A STUDY ON IMPLEMENTATION AND IMPLICATION OF CROP INSURANCE IN RANGA REDDY DISTRICT, TELANGANA STATE

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Since ages, agriculture has been a culture of growing crops for the livelihood of human beings. In this process of evolution, man has developed from a hunter to growing the food crops for his hunger needs. With changes in time, Agriculture has become the main occupation of humans. Along with Agriculture, humans have developed in various fields for supporting their lives like cattle rearing, poultry, carpentry, blacksmith, pottery etc. Growing crop is prone to a variety of risks caused by drought, frost, flood and disease etc. To cover the risk which may occur in the future due to the above reasons, there is always a need for provision. The only mechanism available to safeguard the product risk in agriculture is crop insurance. It provides recovery of loss or damage for growing crops. In agricultural sector the role of crop insurance is extremely important and supporting in increasing the flow of institutional credit. Crop insurance provides and solves the issues and problems of collateral security requirements by bank while granting and extending the loans. In any case of crop failure, bank will get the payment directly from the insurance companies. Crop Insurance, thus promotes flow of institutional credit to the agriculture sector and makes the farmer to adopt new modes of technology.

Psychological Testing and Its Role in Employee Retention: HR Perspective

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Abstract

Psychological testing has become since the last decades of scientific management and personnel selection a powerful and institutionalized instrument that was largely applied.

Universities, managers, engineers, psychologists, and government officials recognized the importance of using scientific methods and tools to manage human resources and the economics of business. Industrial and organizational psychologists emerged as the preeminent players in the development and dissemination of these tools and the evaluation of the tools' real and perceived effectiveness. This article reviews the criteria of adequate tests, faking in psychometric tests, and evaluation of the usefulness of psychometric tests particularly in personnel selection.

Introduction

Smith and Smith (2005: 187) have defined tests as "carefully chosen, systematic, standardized procedures for evoking a sample of responses from a candidate, which are evaluated in a quantifiable, fair and consistent way." Psychometric tests refer to all techniques that have been created for measuring a feature of psychological functioning. These tests are derived from the psychometric model of human behaviour (Malim and Birch, 1998). According to this model, "all behaviour is explicable in terms of factors of ability, personality, motivation and state or mood together with the situation in which individuals find themselves" (Kline, 1992: 101).

Psychometric tests may be divided into three main categories. First, those measuring psychological characteristics, such as ability tests, personality tests, aptitude tests, and motivational tests (Malim and Birch, 1998; Smith and Smith; 2005). Second, those using different methods of measurement, for example in group versus individual tests, direct versus indirect ones, and typical versus maximal performance tests (Abbas, 1996; Fincham and Rhodes, 2005; Smith and Smith; 2005).

Third, those measuring the qualifications of the user at four levels, ranging from very simple tests requiring minimal skills and knowledge, to specialised, intricate tests requiring long and specific training (Smith and Smith; 2005).

Cooper (2002) has argued that psychometric tests play a role in psychology, since theories of personality can be tested if individual differences can be measured precisely. Most modern models of individual difference are based on a psychometric method called "factor analysis," as discussed later in this chapter. Many psychometric tests are used in applied psychology, in educational, occupational, and clinical settings.

First, educational psychologists may use such tests to assess students' achievements, to identify learning difficulties, to predict future performances of pupils and teachers, and so on (Abbas, 1996; Hambleton and Oakland, 2004). Second, tests can be used in clinical settings for prognosis and to assess treatment needs and progress (Abbas, 1996; Malim and Birch, 1998). Third, psychometric tests can be used in organisations for personnel selection by making hypotheses about the ways people act and function, and to predict how they will behave in the future (Farag, 2007; Kaczmarek and Packer, 1997). Thus, psychometric tests may contribute to industrial/occupational psychology by providing organisations with data useful for employee selection and promotion, and for the determination and evaluation of training programs (Abbas, 1996; Essawi, 2003; Gatewood and Field, 2001; Hambleton and Oakland, 2004).

Criteria of Adequate Tests

First of all, measuring instruments should be sensitive enough to be used to distinguish individuals' performance (Coolican, 2004; Malim and Birch, 1998). Insensitive measuring instruments will result in little or no variance, and candidates will be seen to have the same or similar scores. With insensitive measuring devices, it is very difficult to identify significant relationships, and therefore they should not be used, particularly for purposes of personnel selection (Smith and Smith; 2005). In addition, according to Cooper (2002), there are three main criteria for adequate psychometric tests including unidimensionality, reliability, and validity. First, unidimensionality refers to the fact that measuring tests should only assess one aspect of an individual or one underlying dimension at a time (i.e., these instruments should only measure one construct or dimension) (Cooper, 2002). "A construct is a theoretical representation of the underlying trait, concept, attribute, process, and/or structure that the test is designed to measure" (Ackerman et al., 2005: 38). For example, if a test were designed to measure the Conscientiousness dimension, it would be unidimensional if it measured this trait alone.

Second, reliability shows that the items of a psychometric test are consistent with each other and that the test can give constant results over time. Different results would mean that the test was inaccurate and that it was contaminated by error (Asskar, et al., 1992; Coolican, 2004; Malim and Birch, 1998; Smith and Smith; 2005). Kaczmarek and Packer (1997) have pointed out that unreliable tests should not be used for employee selection since they measure errors and unrelated variables rather than the variables that are supposed to be measured. There are a number of procedures for determining the reliability of a psychometric test. One common method is test-retest reliability, which is examined by applying the same instrument to the same group of respondents at two different points in time (in general two weeks to one month is the accepted interval for retesting). A high correlation between the two scores indicates the stability of the test (Abdel-Khalek, 1996; DeVon, et al., 2007). The problems with this method are: (a) the time between the first and the second test is important since if the time is too long, significant changes may have happened to the respondents, or if it is too short respondents may remember their original responses; and (b) it is sometimes difficult and inconvenient to contact subjects twice (Asskar, etal., 1992; Cooper, 2002; Ozer, 1999; Smith and Smith; 2005).

Another technique for determining a test's reliability is parallel-forms reliability. According to this method, two versions of a measure are administered to a sample of subjects, and then the correlation between the two forms is computed. If the correlation between the two scores is high, this shows a high reliability of the measurement (Abbas, 1996; Ewen, 1998; Kaczmarek and Packer, 1997; Ozer, 1999).
This technique also has some disadvantages such: respondents may become fatigued as a result of long tests, which may underestimate reliability; reliability may be overestimated because of poor administration or environment; it has a high cost and requires extra effort; and it is difficult to be sure that the two versions are actually parallel (Smith and Smith; 2005).

The coefficient of internal consistency is another type of test reliability. This indicates that the items of a test are measuring the same construct. Split-half reliability is one method applied to estimate the internal consistency of a test (Coolican, 2004; Farag, 2007; Kaczmarek and Packer, 1997). In this method the items of a measurement are divided into two comparable halves and the responses of each half are correlated. A strong relationship between the two scores indicates that the test is homogeneous; a weaker relationship indicates that the items of the measurement are not homogeneous (Essawi, 2003; Ewen, 1998).

Although split-half reliability avoids the disadvantages of the previous methods, it has one main problem, namely its length. In other words, reliability is related to the length of the test, and therefore, this method will probably underestimate reliability (Asskar, et al., 1992; Mischel, 1999; Smith and Smith; 2005). In addition to the split-half method, there are several other techniques for estimating the internal consistency of a test, such as Kuder-Richardson's Formula 20, and Cronbach's Coefficient Alpha, probably the most widely used index of internal consistency (see Kaplan and Saccuzzo, 2005; Smith and Smith; 2005). Overall, according to Gatewood and Field (2001), if a psychometric test is to be applied in an organisational setting, particularly for purposes of personnel selection, its reliability coefficient should be no lower than .85 which means that 85% of the test score is accurate and the other 15% may be caused by an error. This is important since the validity of a measurement depends on its reliability; it is also important for making accurate assessments and decisions about applicants seeking employment.

Third, validity is one of the most important criteria for adequate psychometric tests. Validity shows that the instrument is testing what it claims to be measuring. There are four main methods for examining whether or not a test is valid (Coolican, 2004; Cooper, 2002; Malim and Birch, 1998; Ozer, 1999). First, face validity refers to whether a test's items appear to be relevant to the test's purpose. While face validity is considered to be the weakest form of test validity since it is so subjective, face validity is important for tests used in organisational settings for a number of reasons, such as: if the items of the measurement seem irrelevant to its aims (e.g., selection and promotion) respondents may become irritated and complain about its meaning and usefulness, which in turn may lead to litigation; and perceived face validity is also essential for managers to believe that a test is appropriate (or related to workers' tasks) and thus support its applicability in their organisation (Gatewood and Field, 2001; Hammond, 2000). Second, content validity refers to whether or not a test contains items that relate to the evaluated characteristic, and whether or not such items are significant, meaningful and not too complicated for the test-taker (Hammond, 2000; Kaplan and Saccuzzo, 2005). A third type of validity is construct validity. Construct validity determines whether or not an instrument provides a correct and valid measure of a specific feature (Farag, 2007).

The final and the most important element is a criterion-related validity that relates to evidence of a correlation between the attributes in a measuring instrument with its performance on some other variable. There are two forms of criterion-related validity. First, concurrent validity is confirmed when scores on a test are correlated to a related criterion at the same point in time. This method, nonetheless, has some practical difficulties include: (a) test-takers may be less motivated since they are already working; (b) job experience can influence test-takers; and (c) the restriction of range is liable to lower the apparent validity, as will be discussed in Study Three later in this thesis. Second, predictive validity requires a longitudinal design, but it is a more helpful type of criterion-related validity. Predictive validity is determined by examining the relationship between test scores and performance criteria, which are measured a period time after the tests have been administered (Asskar, et al., 1992; Coolican, 2004; DeVon, et al., 2007; Ewen, 1998; Kaczmarek and Packer, 1997).

Although predictive criterion-related validity is by far the preferred method of test validation when using psychological tests for employee selection (Abdel-Khalek, 1996; Kaczmarek and Packer, 1997; Smith and Smith; 2005), it also suffers because it requires organisations to employ all applicants involved in the test regardless of their results; and the long time between the test and the collection of data may present another difficulty (Cooper, 2002; Kaczmarek and Packer, 1997; Smith and Smith, 2005). In the current research, however, both methods were used to test the validity of personality traits, cognitive ability, and EI in predicting a number of police work-related behaviours.

Finally, norms represent other important criteria for test evaluation because raw scores on their own are of limited value, since they show little information about test-takers (McKenna, 2006; Smith and Smith, 2005). Norming a measure involves collecting the distribution of test scores in a particular society to provide a suitable frame of reference for understanding the test scores. Norms, therefore, can be used to make comparisons between an individual's score and the scores obtained by an appropriate reference group (Farag, 2007; Kaczmarek and Packer, 1997). Test-takers should be compared with norms based on a sample (larger than 400 is required), which is representative of their community in terms of gender, age, education, and social background (Abbas, 1996; Kaczmarek and Packer, 1997). Therefore, the current research used measures that have been validated within Arabic-speaking contexts, and the data was collected from a large sample.

Faking in Psychometric Tests

Test-takers' faked responses represent one of the central issues that may affect the validity of psychometric tests. Distortion of responses may produce measurement errors that reduce the validity coefficient and lead to incorrect decision-making (Gatewood and Field, 2001; Griffith, et al., 2007; Sandal, et al., 2005). Robie, Brown and Beaty (2007: 490) define faking as "a conscious attempt to manipulate one's responses to create a positive impression." Faking can take two main forms: (a) "faking-good," or presenting oneself in a more positive, impressive light; and (b) "faking-bad," or presenting oneself in a more psychologically troubled or worse light (Abdel-Khalek, 1996; Furnham, 1990; Viswesvaran and Ones, 1999).

A considerable number of studies have been conducted on faking in psychometric tests, particularly with personality inventories (Rothstein and Goffin, 2006). Most research has attempted to answer four major questions; (a) Can people fake personality inventories?; (b) Do people fake?; (c) Does faking affect the criterion validity of personality questionnaire results?; and (d) What can be done to prevent or reduce faking and its effects? (Rees and Metcalfe, 2003; Robie, et al., 2007).

First, regarding whether or not personality inventories are capable of being distorted, a number of studies (Alliger and Dwight, 2000; Furnham, 2005; Rees and Metcalfe, 2003; Sandal, et al., 2005; Viswesvaran and Ones, 1999) strongly support the notion that many personality tests are highly susceptible to a range of response biases, such as faking, extremity, social desirability, and acquiescence. For example, in a meta-analysis of faking abilities, Viswesvaran and Ones (1999) found that participants were able to change their responses by almost half a standard deviation. Similar results were reported by Alliger and Dwight (2000), who found that respondents were able to increase their personality-based integrity scores by a quarter to one half a standard deviation. These results may show that personality measures are susceptible to faking, but in general are only moderately vulnerable to distortion which may support the use of personality measures for personnel selection.

Second, earlier research examining the issue of whether or not people fake personality measures has not provided confident results (Griffith, et al., 2007). Some studies (Griffith, et al., 2007) have found evidence of faking on personality inventories. For example, a recent meta-analysis of faking in personality tests by job applicants has shown that applicants appear to purposely inflate their responses on personality measures and to score significantly higher than non-applicants on four of the Big Five dimensions, namely Conscientiousness, Emotional Stability, Extraversion, and Openness (Birkeland, et al., 2006). Nonetheless, one study (Rees and Metcalfe, 2003) found in an investigation about faking that 65% of participants (n = 190) indicated that they would not "fake-good" in a personality questionnaire when applying for a job. Smith and Smith (2005) have pointed out that there are three major causes of faking behaviour including: the desire to achieve personal gain, such as getting a job; social desirability; and response sets encouraging people to answer yes or no to all questions. In general, research on the issue of job applicants faking personality or EI tests is scarce, and available results have been based on lab studies, mainly with students sample-acting as if they were applying for a desired position, and thus further studies on this subject are necessary (Ones, et al., 2007). Based on this information, faking on personality measures may be less of a concern in a selection situation.

Third, there is little agreement on the issue of whether or not faking has a negative impact on the usefulness of psychometric tests, particularly those measuring personality in a selection context (Griffith, et al., 2007). On one hand, several studies (Rosse, et al., 1998; Rothstein and Goffin, 2006) have strongly supported the view that the validity of a self-reported personality measurement is affected by faking sets. Other researchers, on the other hand, have reported that faking does not have a serious negative impact on the validity of personality tests, and thus does not cause problems in personnel selection (Dalen, et al., 2001; Fincham and Rhodes, 2005; Hough, et al., 1990; Ones, et al., 1996). For instance, one study (n = 713) has found that applicant response distortion increases personality scale means by approximately 0.075 standard deviation units, which is in practice unlikely to generate a huge change in selection decisions (Ellingson, et al., 2007). This finding suggests that faking would make little difference in the applicants' scores, which may have limited or no impact in selection decisions. In other words, faking does not largely damage the criterion-related or construct validity of personality scores in applied settings (Ones, et al., 2007; Sandal, et al., 2005).

Related information has been provided by Hogan, et al. (2007), who studied a large sample of actual job applicants (n = 5,266) who completed a five-factor model personality test twice over the course of six months as a part of a job selection process. They found that: 5.2% of the sample enhanced their scores on any scale on the second occasion; scale scores were a likely to change in negative directions as positive ones; only three applicants changed scores on all five scales beyond a 95% confidence threshold; the construct validity of the personality scales were not damaged across the two administration times; and for the small number of applicants whose scores changed beyond the standard error of measurement, these changes were systematic and predictable using measurements of social skill, social desirability, and integrity. Such findings, based entirely on processes that employers actually use for personnel selection, clearly show that faking self-report measurements of personality is not a major problem in real-world selection settings.

Finally, according to Abdel-Khalek (1996) and others (Birkeland, et al., 2006; Rothstein and Goffin, 2006), there are several methods that can be used to prevent or reduce faking on personality inventories. First, tests can include validity scales designed to detect abnormal responses such as social desirability, or lie detectors (Coolican, 2004; Reid-Seiser and Fritzsche, 2001). Another technique to reduce faking is by writing test items that are difficult to distort, such as forcing respondents to repeatedly make choices between equally desirable personality descriptors (see Hirsh and Peterson, 2008); developing forced-choice measures of personality may have the potential to simply not allow an applicant to give excessively positive views of him or herself (Birkeland, et al., 2006). Personality tests that have subtle items also are less susceptible to intentional distortion because individuals will find it difficult to determine the more positive answer (Ellingson, et al., 2007; Ganem, 2007; Viswesvaran and Ones, 1999). Furthermore, warning participants that faking could be identified may play a significant part in preventing faking (Ganem, 2007; McFarland, 2003; Robie, et al., 2007). Finally, faking on personality tests has been also found to be less of a concern when these tests are used along with other valid predictors that are less susceptible to distortion, such as cognitive ability tests (Converse, et al., 2009).

Evaluation of the Usefulness of Psychometric Tests

Using psychometric tests at work for employee selection has its strengths and weaknesses. On one hand, psychometric tests have a number of advantages which make them useful and helpful in such contexts: (a) they provide organisations with numeric information, which makes it easy to compare people by using the same criteria; (b) these tests are mostly fair, since they play a key role in eliminating favouritism and corruption; (c) several of these tests can save time and money, since they are easy to use and explain their results; (d) because they can cover many dimensions of personality and ability, many tests are more likely to be comprehensive in comparing between individuals characteristics; (e) they may play a role in promoting equal opportunities amongst applicants; and (f) numerous psychometric tests are valid, reliable, and sensitive enough to distinguish between individuals since they are empirically based on theoretical foundations (Abdel-Khalek, 1996; Farag, 2007; Furnham, 2005; Malim and Birch, 1998; McKenna, 2006).

On the other hand, among the main disadvantages of applying psychometric tests at work are that some of these measures are susceptible to faking; and the validity of some tests in predicting workplace behaviour, particularly job performance, is questionable (Cooper, 2002; Furnham, 2005; McKenna, 2006).

There are, however, a number of responses to these disadvantages. First, regarding the problem of faking, it has been shown that this is not a major concern, because some available data has found faking to have low negative effects on criterion-related or construct validity of personality scores in applied settings.

Additionally, faking, particularly “faking-good,” can only occur with self-reported tests, and thus does not affect cognitive ability and certain EI tests based on performance-based approaches. Moreover, as some investigators (Farag, 2007; Hogan, et al., 2007; Ones, et al., 2007) have concluded in regard to the issue of faking: (a) although some self-reported psychometric tests are susceptible to faking, this does not mean that people distort their response in actual settings; (b) even if some individuals fake personality tests, this does not largely harm the tests’ validity; and (c) faking can be identified, controlled, and reduced thorough a range of different techniques as previously reported. Second, although the validity of some psychometric tests at work may be low, a number of studies and meta-analyses provide strong evidence for the validity of cognitive ability and personality traits (such as the Big Five) in predicting various workplace criteria (for example, job performance, training performance, job stress, and CWB).

Taken together, it is clear that psychometric tests are valuable for employers, particularly in the processes of employee selection and training. Goodstein and Lanyon, (1999: 318) have reported that "personality assessment is a vigorous and successful aspect of psychologists' contributions to the workplace.” For instance, a survey of 959 organisations from 20 different countries found that personality measures were found to be the most popular technique in employee selection (Ryan, et al., 1999).

Pre-employment psychological assessments, particularly measurements of personality and cognitive ability, were also widely used in police organisations, because of their validity in predicting key work outcomes such as job performance and deviant behaviours (Hughes, 2003; Weiss, et al., 2008). To summarise, research has shown that personality traits and general cognitive ability are important in determining how a person act and reacts within his or her working environment. These measurements assist organisations to utilise information collected during the hiring process in the most valuable ways, in order to select the best possible candidates. Psychometric testing is one instrument within the pre-employment selection procedure that could provide valid, efficient, and reliable predictors of high performance, and thus it has become one of the fastest-growing methods utilised to select effectual personnel within organisations (Carrigan, 2007).

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Impact Of Emotional Intelligence And Spiritual Intelligence On Leadership Effectiveness- A Study Related To Corporate Sectors

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Abstract

Leadership is described as the heart of every organization and it is a process of leading followers/team. To get better outcome from the employees and to achieve the organizational goals, the leader should be able to understand the pulse of the employees and his or her own. The present research will focus on two vital parameters that are spirituality and emotional intelligence. The present research proposes to study the role of spirituality and emotional Intelligence in the development of effective leadership through extensive literature review. Emotional Intelligence includes self- awareness, empathy, self- motivation, emotional stability, managing relationships, integrity, sociability, of spirituality and emotional Intelligence in the development of effective leadership through extensive literature review. Emotional Intelligence includes self- awareness, empathy, self- motivation, emotional stability, managing relationships, integrity, sociability warmth and optimism on the part of the leader reflecting it onto the followers and spirituality comprises the values, attitudes, and behaviors that are reflecting compassion, vision, hope, commitment, satisfaction and happiness that are necessary to intrinsically motivate one and others.

Keywords: Spirituality, Emotional Intelligence, Empathy, Sociability, Values, Compassion, Commitment, Satisfaction and Happiness.

Introduction

Our World to days as more civilized societies with ever expanding population, having diversity in racial polarization, creed and gender One common thread or feature in all thesepeopleisthateveryonehasfeelingsandemotions,andemotionsengenderemotionalintelligence. We, being humans also known as social animal, are superior over other living creatures- we can think, feel and rationalize. Because of that we are being deceived by behaviors, traits, perceptions, mindset patterns and attitudes. All these call for some kind ofsetorderwhereonecanactandinteractwithoneanotherinwaysthatarenotrepulsive, butin harmony and with the decorum that portrays one to be civilized. Leadership is a dynamic process of relationships building between individuals and groups. The constant nourishing of individuals is at the core of effective leadership. Organization now emphasizes the need for leaders to take on roles of facilitating, coordinating and orchestrating the work behavior ofothers.Effectiveleadersimproveperformancebyassumingalevelofcompetenceandbuildingupon existing strengths.

A paradigm shift of Indian economy started with the introduction of economic reforms in the early 1990's. Due to opening up of Indian economy through Liberalization, Privatization and Globalization, and thrust towards Information Technology.

Concept of Emotional Intelligence:

Before explaining the meaning of Emotional Intelligence, it is essential to understand the term "Emotion". It relates to ability to check or judge the other's attitudes or other's actions. There can be a number of emotions like anger, sorrow, fear, gratification, surprise, love,repulsion,shameetc.Aleader'scapabilitytobalancetheemotionswiththereasontomaximize long-term happiness i.e. capacity of effectively identifying and managing one'sownemotionsandthoseofothersmaybecalledasemotionalawarenessoremotionalmanagementofskills.

Emotional intelligence helps human constructs stronger relationships with family and society to do well at work, and accomplish our professional and personal goals. Emotional intelligence is something which gives a person a competitive edge.

Some researchers propose that emotional intelligence can be learned and strengthened, while others claim it is a nine born characteristic. It is the capacity to distinguish, utilize, comprehend, and deal with your feelings in positive and productive ways. It's about perceiving your own emotional state and the emotional conditions of others.

Definition of emotional intelligence:

In the opinion of Daniel Goleman (1995) "Emotional Intelligence as being able to motivate oneself and persist in the face of frustrations; to control impulses and delay gratification; toregulateone'smoodandkeepdistressfromswampingtheabilitytothink;toempathizeand to hope."

Peter Salovey and John Mayer (1990) defined Emotional Intelligence as "the sub set of social intelligence that involves the ability to monitor one's own and other's feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions."

Cooper and Sawaf (1997) outline Emotional Intelligence as "the ability to sense, understand and effectively apply the power of and acumen of emotions as a source of human energy, information, trust, creativity and influence.

Spiritual Intelligence:

Robert Emmons (2000) defines spiritual intelligence as "the modify use of spiritual information to ease everyday problem solving and goal achievement."
SinghG.(2008) defined spiritual intelligence as" an in born or natural capacity of thinking and ability to understand of spiritual fact and to guide the everyday behavior by spiritual beliefs".

Definition of Spiritual intelligence:

Frances Vaughan (2002) defined as "Spiritual intelligence is related with the inner life of mind and spirit and its relationship to being in the world."

Cindy Wigglesworth defines spiritual intelligence as "the capacity to act with experience or knowledge and pity, while maintaining inner and outer peace, regardless of the circumstances."

The four quadrants of spiritual intelligence are defined as:

Multiple belief systems/ Divine Self
Universal Consciousness
Divine Self/ Self Discipline
Spiritual Presence/Community building.

Concept of Leadership:

Leadership is a process whereby an individual influence a group of individuals to achieve a common goal. Leadership is the ability to influence individuals or groups toward the achievement of goals. It is a process where a leader influences the direction of a unit in achieving its objective. Leaders need the ability to absorb and comprehend a lot of information and get to the heart of issues quickly and make decisions.
Leadership has been described as “a method of social impact in which one person can enroll the benefit and support of others in the completion of a common task”

Definition of Leadership:

Burns (1978) comments that, "Leadership is one of the most observed and least understood phenomena on earth."

Relationship of Emotional and Spiritual Intelligence:

EI and SI support organizational principles, ethical values and all organizational decisions. The need for all leaders to have EI with spiritual strength and lead with more meaningful behavior or the importance of the relationship between emotional and spiritual intelligence and the efficiency of leaders.

EI and SI are interrelated and strengthen each other. Spirituality growth enhances emotional awareness. This in turn impacts the competence of managing and controlling emotions, which further reinforces spiritual development. Thus, EI level affect one’s use of SI. Spiritual knowledge facilitates understanding reason and emotion. Many elements of both emotional and spiritual intelligence are common.

Spirituality develops the intrapersonal and interpersonal competences that are the components of Emotional Intelligence.

This is the belief in current scenario that the corporate world is more into materialistic, commercial and strictly profit oriented values, whereas it is important to acknowledge spiritual and ethical aspects being equally important while conducting business.

Discussion and Conclusion:

The present review was conducted to analyze whether spirituality and emotional intelligence make a manager an effective leader. Effective leaders make a better organization and create an inclusive culture. Leadership is the process of social influence as the behavior of the leader affects the followers' behavior to a great extent. Leader is the member of the group or organization who plays an important role in influencing the behavior of the members of the group or organization. Success of the organization depends on its leaders as they have facilitative, innovative, inspiring vision and empower people to transform the vision into reality. Among all the important traits of leaders which take organization to greater heights, emotional quotient and spiritual quotient play a pivotal role.

The characteristic manifest of high EI encompass self- awareness, empathy, self- motivation, emotional stability, managing relationships, integrity, sociability, warmth and optimism on the part of the leader reflecting it onto the followers and spiritual leadership comprises the values, attitudes, and behaviors that are reflecting compassion, vision, hope, commitment, satisfaction and happiness that are necessary to intrinsically motivate oneself and others. Ample research has been conducted to understand the reflects that for any organization to grow and develop the level of EI of the managers / leaders matters a lot as EI is an important indicator of personal and professional success.

The earlier study where data from more than 30 different behaviors from banking, mining, geology, sales and health care industries documented that a number of emotional intelligence competencies, qualities such as, achievement drive, developing others, adaptability, influence and self- confidence distinguished top performers from average ones.

Another study which supports the fact how EI is an important indicator of general wellbeing of the employees shows a significant correlation between Emotional Intelligence and general wellbeing and both in turn contribute to employee behavior which is critical to job performance. There is growing evidence that spiritual practices are associated with better health and wellbeing at personal front; and a better organizational culture, organizational effectiveness and productivity at professional front as our personal translates onto our professional. Seeing the vital role these spiritual practices play in our personality and behavior, the studies were analyzed to emphasize the role spirituality plays in the development of an effective leader.

The review reflects that for any organization to grow and develop the level of spirituality of the manager / leader plays a dynamic role as it improves the culture of the organization. It is an important indicator of personal growth as mentioned "Spirituality is concerned with those qualities of the human spirit-such as love and compassion, patience tolerance, forgiveness, contentment, a sense of responsibility, a sense of Wholeness and harmony which bring happiness to both self and others" When one has the high spirituality quotient it will reflect on the professional front also Appreciative Inquiry was conducted on a group of senior managers of a reputed educational institute to gain an insight and discuss the feasibility and implication of the research.

An assumption was made that the managers who are high on spirituality may have high level of emotional intelligence also as these two parameters are very important factors of a stable and balanced personality. A true and effective leader is that who is happy with his own self and makes others also happy and gives them opportunities to grow as he is happy and satisfied with his own growth. He is in “I am OK, you are OK” life position.

Leaders with high levels of emotional intelligence positively apply social skills to influence others, create strong relationships with clients and employees, and are effective motivators by controlling their emotions and understanding their weaknesses In today’s world successful leaders are those who provide emotional quotient, will also be ranked high on their spirituality index also, as these two parameters are very important factors of a stable and balanced personality.

A true and effective leader is that who is happy with his own self and makes others also happy and gives them opportunities to grow as he is happy and satisfied with his own growth. He is in “I am OK, you are OK” life position.

Leadership qualities reflected by an effective leader are those which are the outcome of spirituality and high emotional intelligence. The 7% of leadership success is attributable to intellect; 93% of success comes from trust, integrity, authenticity, honesty, creativity, presence and resilience.

Leaders with high levels of emotional intelligence positively apply social skills to influence others, create strong relationships with clients and employees, and are effective motivators by controlling their emotions and understanding their weaknesses In today’s world successful leaders are those who provide opportunity and training to everyone to develop to the next level. It was clearly demonstrated that developmental style is the most desirable style and it is associated with creation of empowerment, growth, learning, morale and satisfaction on part of the employees.

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STABILIZATION OF PAVEMENT SUBGRADE BY USING FLYASHREINFORCED WITH BITUMEN COATED CHICKEN MESH

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The design of a flexible pavement is majorly dependent on the characteristics of soil sub grade which acts as the base for the entire payment structure. So, great care is to be taken in the performance and design analysis of pavement construction. The expansive soils are very rich in percentage of silt and clay the soil sub grade is to be stabilized or compacted before laying a flexible pavement. Stabilization for this type of soils can be achieved by replacing sub grade soil with other material. The current utilization of fly ash is about 55%, which is an industrial waste. The fly ash can be properly utilized by replacing it in sub grade along with bitumen coated chicken mesh at different percentages and different layers of chicken mesh placement. Implementation of additional reinforcement in the form of bitumen coated chicken mesh improves the California bearing ratio to a better extent. In this study, samples of fly ash impacted to its maximum dry density at the finest moisture content it is adopted with and without chicken mesh layers in the CBR mould. Chicken mesh sheets equal to the plan dimensions of CBR mould it is placed in the preparations of 1,2,3,4 layers and later chicken mesh is placed in all layers. CBR values are evaluated in the laboratory and the maximum value of CBR at 15% replacement of fly ash with bitumen coated chicken mesh at four layers is exhibiting high strength properties.

STUDY AND ANALYSIS OF IMPACT OF BIGDATA ON SOCIAL MEDIA

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Abstract: The development of online web-based media administrations has made a subjective jump and carried significant changes to different parts of human, social, scholarly, and public activity. These critical big information feeders have further changed the organizations processes by setting up merged and straightforward discoursed among organizations and their clients. Thusly, dissecting the progression of social information content is vital to upgrade strategic approaches, to increase brand mindfulness, to foster experiences on track markets, to recognize and distinguish positive and negative client feelings, and so on, accordingly accomplishing the expected added esteem. This research presents an outline of Social Big Data term and definition and analysis of social media platform and its effects with big data.

Understanding the Impact of Family Counseling On Dysfunctional Families' Spiritual Intelligence And Self-Differentiation

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Family is like a human body where every part is affected by the other. Being the centerpiece in the Indian society, it feels great to have a family and at times a huge challenge. The family members, youth, couple, adults, all have some good and bad experiences in a family. But the personal and relational difficulties lead to opportunities for developing a wide variety of psychological problems like mental and physical illness, family conflicts, cultural adjustments, ageing, eating disorder, divorce, trauma thereby creating demands for family therapy. Thus, the current review attempts to highlight the concept of family therapy. The present paper also focus on goals and need of family therapy with its major emphasis on how family therapy helps in supporting and better understanding each other's view, enabling individuals to explore, express and experience emotions, working on strengthening relationships. There are potential barriers and cultural issues in providing the services. Thus, there is a strong call for involvement of family in providing therapies and mental health services in order to get solutions beyond any constraints. The present study is descriptive in nature in which 500 couples are considered as a sample size. Data is collected with the help of some pre-defined questionnaire. There were so many statistical techniques were applied on collected data to get desired results.

A DESCRIPTIVE STUDY ON SUDHA MURTHY'S NOVELS: DOLLAR BAHU, MAHASHWETA, HOUSE OF CARDS AND GENTLY FALLS THE BAKULA

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Indian writers in English have created the best significant contribution to the area of the novel. Ever after the publication of Bakimchandra Chetterjee's Rajmohan's Wife, Indian novel has grown significantly in bulk, maturity and variety and it's marked difference from Raja Rao to still the 20th century writers most problems in the writings of theirs like political, sexual, economic, social, racial, communal and gender issues domestic violence as well as gender issue nonetheless the subject of theirs. Today male's life is actually dominated by Economical, cash constrain everything. House is the place of love, affection, sharing and sacrifice with the members of family but at this point the turn of its to the place of fulfilling unworthy expectations of other's it leads to misunderstanding, suppression, violence and depressions in the relationship of theirs.

ASSESSING THE ROLE OF ARTIFICIAL INTELLIGENCE IN CYBER THREATS IN BANKS

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The advancements in information technology (IT) have made cyberspace an attractive target for thieves. Because of this, cyber infrastructures are very susceptible to attacks. Rather than relying on physical equipment and human involvement to keep an eye on and defend these infrastructures, we need advanced cyber security systems capable of detecting a broad range of threats in real time, as well as making quick and informed choices. The detection and prevention of cybercrime have benefited greatly from many bio-inspired computer techniques of Artificial Intelligence. The application of artificial intelligence (AI) is becoming more common in financial organizations, including banks. Banking operations are made more efficient using AI technology, and customer contact and experience are improved as well. This study concludes that artificial intelligence is important in the banking industry. Information AI informs banks and other financial organizations about cyber-attacks and the costs of resolving them. Artificial intelligence methods can detect a wide range of fraud and data breach problems. This study examines how artificial intelligence plays a role in bank-related cyber risks.

SIGNIFICANCE OF FINANCIAL INCLUSION ON ECONOMIC DEVELOPMENT OF INDIA

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Financial inclusion is regarded as a critical facilitator of economic progress and has thus been prioritized by the majority of developing countries. The challenge in serving financial services lies in the lack of a systematic data of financial inclusion in our country. Financial innovations can expand major frontiers for the financial access. India represents a paradoxical dynamic economy, with its high growth followed by a fast expanding rich and middle-class population, come citizens on one hand and lack of minimum income with other basic facilities for a large chunk of the population on the other. This research investigation deals with changes in the Indian economy, including the development process, policies, programs, reforms, etc. adapted over time in India and the impact of it on the Indian economy under both positive and negative aspects. The study also establishes the relationship between FI and monetary policy of India and thereby evaluates the effectiveness of monetary policy on FII. The research shows that the initiatives are implemented but they are still in the direction of successful results. Thus, through this research work, we have described the importance of inclusive growth strategy in the development process, policies, programs, reforms, etc. in India. It is observed in this study that measures to be adopted for the successful implementation of inclusive growth strategy heading towards all-round economic development of the Indian economy.

E-COMMERCE AND M-COMMERCE: GLOBAL SCENARIO AS A TRENDING PERSPECTIVE-A STUDY

Dr. N. Ramanuja Naraharisetti, G.VenkataPurna,

The study examines and identifies the impact E-Commerce and M-Commerce and its global trends on international trade. The study has been concentrated on the online shopping and the percentage of sales that have increased as a result of the change in business activities through online shopping platforms. As digitalization has increased in India and all over the world, the purchasing capacity of the customers has also increased along with the ease of doing business, which also has improved. An analysis has been made on the impact of increased Internet sources and the resultant increase in the usage of m- commerce and also the transactional level of the e-commerce industry. The transformation of traditional business activities has been changed to online platforms. This resulted in an increase in the scope of business entities to encompass increased and elaborate business functions and luring customers from around the world through international trade. This success has been associated with the increased use of mobile devices and to the technical applications which have been promoting online businesses primarily and with the help of Omni channels and improved logistics for a competitive world. The maintenance of customer friendly interface, easy problem-solving mechanisms and attempts at educating the customers in the perspective of online proforma will enable the business growth to reach a higher range.

RESOLVING THE WORK-LIFE ISSUES FOR IMPROVING EMPLOYEE ENGAGEMENT AND COMMITMENT

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Throughout the years there has been a developing enthusiasm for the Fields of Work life balance and Employee Engagement activated basically because of conspicuous changes in the financial arrangement over the timeframe. The social set up is likewise transforming from the joint family arrangement to nuclear family, which requests equivalent consideration regarding the family commitments and work. So as to deal with the work pressure and family pressure harmony is required and the equivalent can be attempted accessible by endeavors from both employer and employee. In perspective on extension in the open doors for the ability work constrains it is required by the employers to go that additional mile for taking different initiatives empowering negligible work-family struggle in the lives of employees. Both the ideas work life balance and employee engagement have nearly been for 1 ½ decade now and results from different research have demonstrated past sensible uncertainty that Work life balance factors are being considered by employees while choosing to work for a specific organization. Presently we have grants for the best employer classification in different Industry fragments being given by different experts, news office, industry affiliations, scholastic body, Government which shows the ramifications of marking as a best employer. Business pioneers of the world know about the way that keeping their groups connected with can mean distinction between business achievement and disappointment.

AN OVERVIEW ON THE CHALLENGES AND ROLE OF TEACHERS OF INCLUSIVE EDUCATION FOR DISABLE STUDENTS

Venkateshwarlu Chukka, Research Scholar, Career Point University, Kota, Rajasthan

Due to international commitments to the education of children with disabilities, India has seen significant legislative changes and a rise in the number of children enrolled who had previously been excluded from the formal education system there. People's perception of disability and the acknowledgment of disabled people's rights have changed dramatically throughout the world. For the protection of people with disabilities' rights, India enacts the 'Right of Persons with Disabilities Act, 2016'. However, the social history of people with disabilities in India shows that despite many legal protections and regulatory frameworks, they continue to suffer several disadvantages. The implementation of inclusive education is seen as being impossible without the involvement of educators and administrators. For this reason, they are considered lynchpins in the process of integrating students with impairments into normal classrooms. This will be impossible unless people practice and develop attitudes toward inclusive education. An outline of the difficulties and responsibilities of inclusive education instructors for children with disabilities is provided in this article.

DESCRIPTIVE RESEARCH ON ADAPTABILITY FROM TRADITIONAL EDUCATION TO ONLINE EDUCATION IN INDIA

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Corona Virus, commonly known as Covid-19, is a fatal and contagious illness that has had a significant impact on the world economy. This catastrophe has also rocked the education industry, and this dread is likely to spread across the world's education system. Many schools and institutions were forced to shut temporarily because of the Covid-19 epidemic. Several regions are impacted globally, and there is concern that the current semester, as well as future semesters, may be lost. In-person instruction has been phased out in a number of schools, colleges, and universities. According to the experts, it is unlikely that regular teaching will resume very soon. Because social distance is so prevalent at this point, learning chances will suffer as a result. Educational institutions are scrambling to come up with solutions to this difficult scenario. These situations highlight the need of scenario planning for academic institutions. This is a scenario that requires compassion and cooperation. Our students, professors, academic staff, communities, societies, and the country as a whole all need to be protected and saved

ROLE OF HOCKEY INDIA LEAGUE IN PERFORMANCE OF HARYANA HOCKEY PLAYER

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Abstract

The conducted study was a humble attempt to study the views and expectations of Haryana Hockey players regarding the Hockey India League. A graphic strategy has been utilized for this exploration. A sample of 30 players was selected with the help of a purposive sampling method from the players who participated in the HIL Tournament. A self-prepared questionnaire was used for the purpose of this investigation. The percentage method was used to analyze the data. The findings of the study were: (i) The study shows that the entirely players participated in the study give their answer in yes which is 100%. Therefore the conclusion is that each and every player get fame after participated in HIL. (ii) The result shows that every player says yes (96.67%) except only (3.33%) who is not aware about his fitness. Therefore we can conclude that more of every player get aware about their fitness after participated in HIL.(iii) The study convey that 28 of 30 testee give answer in yes (93.3%) and only (6.67%) that they were not aware about their skill performance. Therefore the conclusion is that the awareness about skill performance of players increases after participated in HIL . Hence we can say that every player get fame after participated in HIL and the get aware about their physical fitness and skill performance.

Key Words: Hockey India League, Haryana, Hockey Players.

Introduction

Hockey India League (HIL)

Hockey India League (HIL) was founded in the year 2013 as part of Hockey India's attempt ten get an International Hockey Federation (FIH)) sanctioned league after the un-sanctioned and non-Hockey India tournament, the World Hockey Series held in the year 2012. The 1st season occurred in the year 2013 with five teams. The league was organized by "Hockey India," the governing body for the sport in India. The HIL, along with the "Indian Premier League (IPL), Indian Super League (ISL), and Pro Kabaddi League (PKL)," is considered one of the major sports leagues in the country India. The HIL consists of six-teams, with the regular season lasting two months from January to February, with each team playing ten games.

At the end of the season, the top four teams move into the play-offs, where the championship decides the Hockey India League (HIL) champion. Since the beginning, the HIL had proven to be a financial success for hockey India, which was in financial disarray before the league began. In the year 2015, it was reported that the hockey federation earned a profit from the HIL and television revenues. The most recent winners of the Hockey India League in Kalinga lancers, who the tournaments in the year 2017 Ranchi Rhinos, Delhi wave riders, Ranchi Rays, and Punjab worriers have also won the league.

Performance of Players in Hockey India League (HIL)

The HIL began in the year 2013 has also seen some success. The infrastructure has been the most OK class. There have been two seasons so far. There have been hockey players from different countries, namely England, South Africa, New Zealand, Australia, Malaysia, Holland. The Indian hockey players have learned and gained experience from foreign hockey players. Mainly, the penalty corner conversion skill of Indian hockey players has improved. Current local players from India like Mandeep Singh, Manpreet Singh have improved their skills and got a nod in the national team squad. The standard of endurance of Indian hockey players is also improving. Moreover, their exposure is proving beneficial for the Indian

Hockey team. There is a range to get fresh talents identified with seven teams in the competition. There is a requirement to expand the HIL to different states to benefit the most.

Aim

To study the Role of Hockey India League in Performance of Haryana Hockey Player.

Objectives of the Study

1. To find out that the Haryana hockey players in India get fame after participating in HIL.
2. To find out the Haryana hockey players get aware about their fitness after becoming HIL players.
3. To find out that how much Haryana hockey players aware about their skill performance after HIL players.

Hypothesis of the Study

1. The Haryana hockey players get fame after becoming HIL players
2. The Haryana hockey players thinks that after becoming an HIL player they are more aware about their fitness
3. The Haryana hockey players before HIL was more aware about their skill performance

Method of the Study

Method for research depends on the chose issue nature. In this exploration, quantitative and subjective methodology has been utilized. A graphic strategy has been utilized for this exploration.

Selection of Sample

A sample of 30 hockey players was selected with the help of purposive sampling method from the players who had participated in HIL tournament.

Source of Data

The Hockey India League players who belong to Haryana and represented various teams of the Hockey India League Tournaments were the source of data for the present work of the research.

Used Tools for the Investigation

Self-prepared questionnaire was used for purpose of this investigation.

Statistical Technique

Percentage method was used to analyze the data.

Data Analysis and Interpretations

Table 1: Did you get fame after becoming HIL player?

Group	Responses	Frequency	Percentage
Players	Yes	30	100
	No	00	00
	Total	30	100

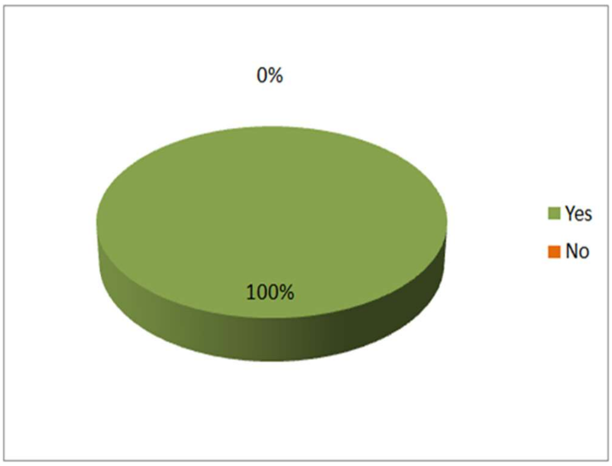

Table no.1 portrays the percentage distribution of players participated in the survey that participation in HIL make them famous. All the subjects participated in the study given their answer in "yes" which consists of 100 % affirmation. Therefore, we canconclude that the players get recognition in his area after becoming HIL player.

Table 2: Do you become more aware about your fitness after becoming the HIL player?

Group	Responses	Frequency	Percentage
Players	Yes	29	96.66
	No	1	3.33
	Total	30	100

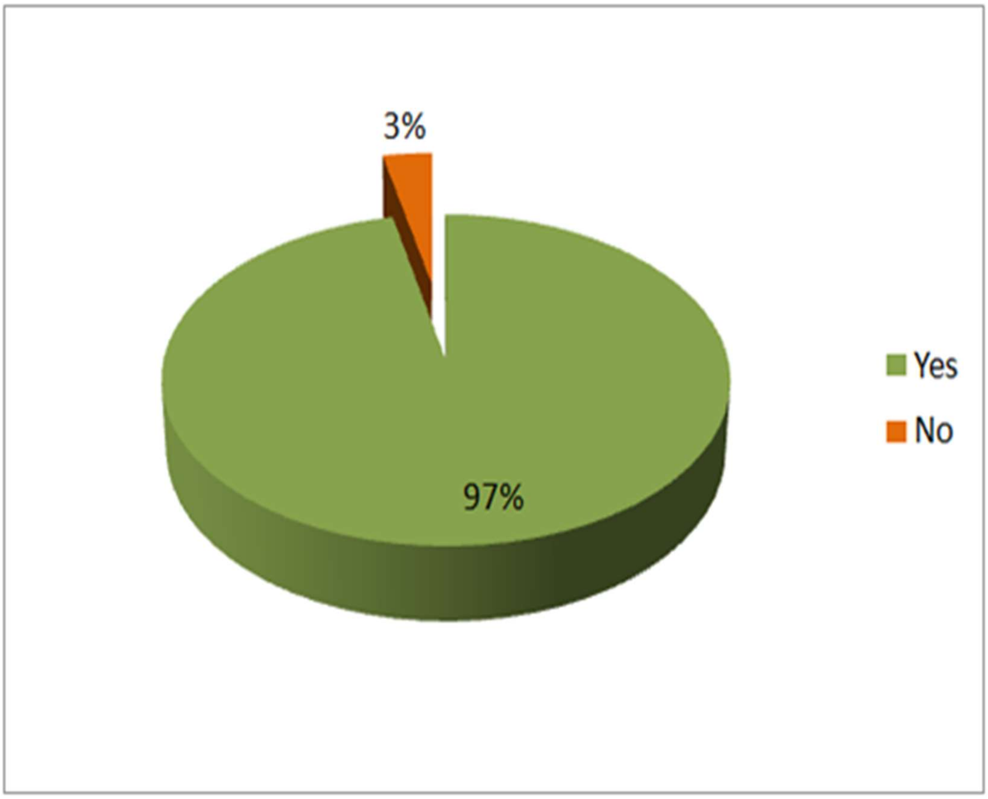

Table no. 2 reveals the percentage distribution of players participated in the Survey about their awareness about fitness after becoming the HIL player. An overwhelming majority (97%) of the players responded “Yes”, while only 1 (3%) respondent responded “No”. Therefore, we can conclude that HIL force the participants to be more physical fit. So that their performance can be enhanced.

Table 3: Were you become more aware about your skill performance before becoming the HIL player?

Group	Responses	Frequency	Percentage
Players	Yes	28	93.33
	No	2	6.66
	Total	30	100

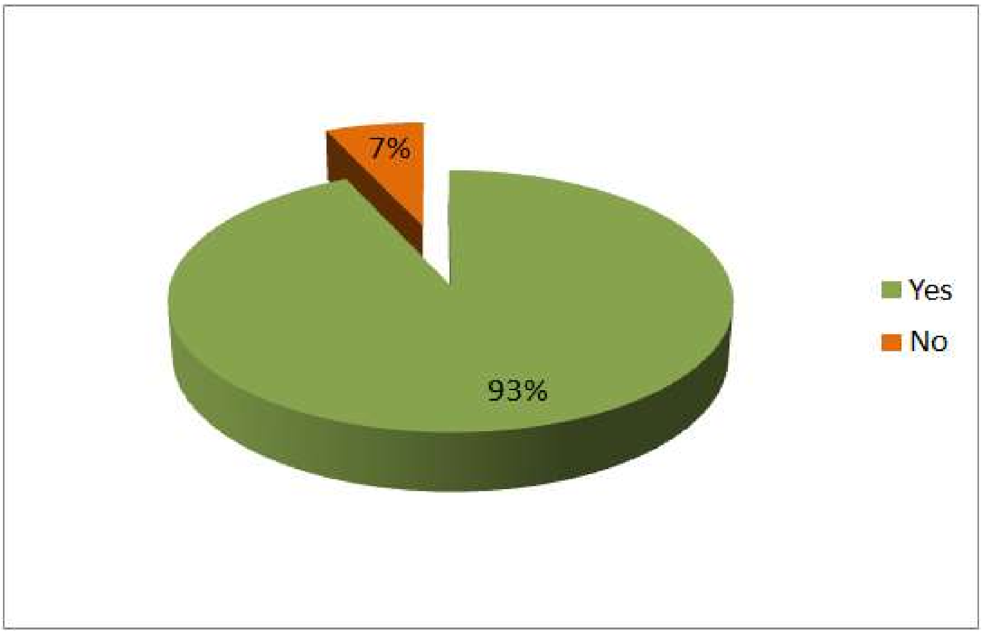

Table no. 3 shows the percentage distribution of players participated in the survey about awareness about skill performance before becoming the HIL player. A large majority 28 (93%) of the players responded "Yes", while only 2 (7%) respondent responded "No". Therefore, we can conclude that skill performance has significant role in the performance of participants in HIL. Therefore, the participants give more emphasis on the skill training of Hockey.

Findings and Conclusions of the Study

All the subjects participated in the study given their answer in "yes" which consists of 100 % affirmation. Therefore, we can conclude that the players get recognition in his area after becoming HIL player.

An overwhelming majority (97%) of the players responded "Yes", while only 1 (3%) respondentresponded "No". Therefore, we can conclude that HIL force the participants to bemore physical fit. So that their performance can be enhanced.

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Hence we can say that every player get fame after participated in HIL and the get aware about their physical fitness and skill performance.

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ANALYTICAL STUDY ON FACTORS AFFECTING CUSTOMERS: WITH REFERENCE TO ADOPTION OF MOBILE BANKING

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In the present serious condition, businesses challenge to offer better items and administrations to customers. With the development of 5G communication advances and Internet+ system, mobile commerce has encountered fast development and requirements pressing consideration from scientists, mobile devices can be consistently associated with the online stores of merchants, in this manner advancing the quick extension of their mobile stores. The usage of mobile devices has been expanded step by step with the improvement of information technology. Digital trading has been the most common trend of operating together rather than e-commerce of the past. The investigation expected a number of factors to influence the adoption of M-commerce. M-commerce provides increasingly popular open doors for easier entry, gradually competitive, all the more remarkable and completely accessible software everywhere it is for its consumers. As the quantity of internet users increases by bounds and leaps, the significance of electronic commerce (web-based business) channels heightens among different deals channels. The Internet empowers items and administrations to arrive at huge masses in a versatile manner. Subsequently, the two professionals and academicians show extraordinary enthusiasm for estimating and understanding the adoption conduct of web-based business users. As for the implications of the Systemic Equation Modelling, while self-reliance may not have a vital influence on the adoption of mobile commerce, perceived ease of usage, perceived utility, perceived satisfaction, creativity , social and confidence impacts have tremendous and beneficial effects on the adoption of mobile commerce.

APPLICATION OF TAGUCHI METHOD FOR CONTROLLING THE QUALITY OF PRODUCT

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Dr.M .Mohammed Asif, Researcher Supervisor, Career Point University

Quality has consistently aroused human curiosity. Present day innovation is proof of man's consistent desire to further develop labour and products to get a bigger portion of the overall industry and make more cash. Quality is significant now and again. One of the most significant serious difficulties of the 1990s has been quality. The present worldwide commercial centers place more accentuation on quality than at any other time, and most organizations can never again disregard this reality. Since the past quite a while, Taguchi methods have demonstrated to be viable in further developing item quality and interaction execution. To accomplish a steady surface completion, an assortment of cutting interaction qualities should be thought of. Tests in modern cycles might be concentrated on utilizing the plan of analysis method. A system that depends on the improvement of numerical models through trial and error is known as a statically situated approach. Involving the Taguchi Method for Quality Control and Management is the focal point of this review.

A NOVEL APPROACH OF SOFT SWITCHING FULL BRIDGE DC-DC CONVERTER USING PULSE WIDTH MODULATION METHODS

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Dr .S.Manikandan, Researcher Supervisor, Career Point University

In this research paper explains a new soft–switching dc converter is can solve the drawback of the existing phase – shifted full-bridge convertor. This proposed method on narrow zero-voltage, switching (ZVS) range, large circulation current, large duty-cycle loss, and large output filter in high voltage applications. This is mainly development of a novel prototype. It is designed for utility-grid tied photovoltaic (PV) power invertors. The high frequency transformer (HFTR) link DCDC converter topology is based on a new concept such as secondary-side-series resonant principle and its inherent from nature. The active power switches in the HFTR primary-side can achieve lossless capacitive snubber based ZVS (zero voltage switching) with the transformer parasitic inductances. These passive switches in its secondary-side can perform ZVS AND ZCS transitions for input voltage and load variations. In this paper describes the operation of the newly proposed DC-DC converter and some features of basic simulation analysis, then 5kw experimental setup of the DC-DC converter is demonstrated and its experimental results are given in practical point of view. Finally given some comparative evaluations between simulation and experimental data are discussed so it is considered as future works.

MOBILE AGENTS' TECHNOLOGY UTILIZATION FOR ENERGY EFFICIENCY IN WIRELESS SENSOR NETWORK

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Dr Mohd Ateeq Ur Rahman, Researcher Supervisor, Career Point University

A wide range of high-impact applications may be supported by wireless sensor networks (WSNs), which are becoming more popular. A difficult challenge for software developers is how to deal with WSNs because of the unique properties of these networks, which combine distributed sensing, processing, and communication in a single system. Using code mobility as a distributed computing paradigm, mobile agents have exhibited excellent efficacy and efficiency in IP-based dynamic contexts. When used in conjunction with WSNs, mobile agents, in our opinion, may be more beneficial than in more traditional dispersed setups. Changing or recharging the battery might be challenging since many of these devices are located in places that are tough to reach. As the sensor data is sent to the base station and the event is sensed, the battery life of energy-constrained sensors is shortened dramatically. Routing holes and shorter network lifespans are both the result of nodes running out of energy. This research provides an energy-efficient multiple sink placement technique that maximises average network life and minimises average sensor network power consumption. For data transmission, a slew of sinks are used. The suggested approach results in a longer average network life and a lower average energy use. End-to-end latency, energy consumption, and output are all exceeded by the Protocol suggested in the simulation.

THERMODYNAMIC FUNCTIONS VIZ. ENTHALPY AND HEAT CAPACITY OF SUBSTITUTED HYDROXY PYRIDINE

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Abstract

The infrared absorption spectra of 5-bromo-2-3-dihydroxy pyridine have been recorded. The bands observed in the IR spectra are discussed by assuming the compound under Cs point group symmetry. Thermodynamic functions viz. enthalpy and heat capacity have also been calculated by using IR frequencies at different temperatures with the help of computer programming.

Introduction : The aromatic compounds like benzene like benzaldehyde, pyridine, pyrimidine, uracil, cytosine and their derivatives are of great biological importance as they play an important role in the structure and properties of nucleic acid [1-3]. However due to their great complexity and low symmetry only a little spectral studied by some workers [4-6]. The vibrational spectra of di-substituted pyridines have also been studied [7], but very little work appears on the IR spectra of tri-substituted pyridines [8]. Some workers [9-12] have also studied the electronic spectra of pyridines and substituted pyridines. In view of these the present paper reports the thermodynamic functions viz. enthalpy and heat capacity of 5-bromo-2-3-dihydroxy pyridine.

Experimental : The infrared absorption spectra of 5- bromo-2,3, -dihydroxy pyridine (here-after referred as 5,2,3-BDHP) was recorded on Perkin Elmer spectrophotometer model-52 in the region 400-4000 cm^{-1} using KBr pellets techniques. The thermodynamic parameters viz enthalpy function $(H^o–E^o_o)/T$, and heat capacity $(C_p{}^o)$ function with absolute temperature have been calculated by using computer programming.

Result and Discussion : The structural formula of the compound 5,2,3-BDHP is given in Figure 1.

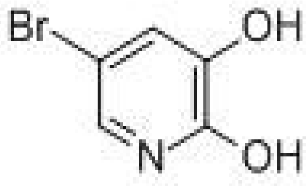

FIGURE: 1 MOLECULAR STRUCTURE OF 5,2,3-BDHP

The thermodynamic parameters viz enthalpy function $(H^o–E^o_o)/T$, and heat capacity $(C_p{}^o)$ function with absolute temperature are given in Table 1 for 5,2,3-BDHP. The variation of enthalpy and heat capacity function with absolute temperature is shown in Figure 2 and 3 for 5,2,3-BDHP.

THERMODYNAMIC FUNCTIONS : The thermodynamic parameters viz enthalpy and heat capacity of the compounds 5,2,3-BDHP have been computed by using the standard expressions [13-14] by taking X axis to pass through the para position and position and Y axis perpendicular to molecular plane. For determining the rotational contribution the following structural parameters were used [15-16].

Bond Length (Å)	**Bond Angles (º)**
N_1C_2 = 1.43	□ $N_1C_2\ O_7$= 121º
C_2C_3 = 1.33	□ $C_3C_2\ O_7$= 119º
C_3C_4 = 1.32	□ $C_2\ C_3\ O_8$= 122º
C_4C_5 = 1.39	□ $C_4C_3\ O_8$= 118º

C_5C_6 = 1.39	□ $C_4C_5\ O_{19}$= 118º
C_6N_1 = 1.38	□ $C_6C_5\ O_{19}$= 122º
C_3C_8 = 1.43	□ $C_2C_3\ C_4$= 120º
C_5C_{19} = 1.75	□ $C_3C_4\ C_5$= 120º
	□ $C_4C_5\ C_6$= 120º
	□ $C_5\ C_6\ N_1$= 120º
	□ $C_6N_1\ C_2$= 120º

The thermodynamic functions have been calculated at different temperature between 200-1500ºK by using (3n-6) fundamental frequencies for the said compound and assuming rigid rotator harmonic oscillator approximation. The calculations were performed for one mole of an ideal gas at one atmospheric pressure. The symmetry number for overall rotation and internal rotation has been taken as two. The principle moments of inertia were found to be 0.3863, 0.8615 and 1.2478×10^{-37} gm-cm^2 for the said molecule. All the thermodynamic parameters are plotted as function temperature (Figure 2 and 3). From graphs it was found that all the thermodynamic parameters rise more rapidly in the low temperature range and less rapidly in the high temperature range.

At very high temperature greater than 1500 K the influence of anharmonicity will be large and the expressions used for the calculation will not give an accurate value of thermodynamic parameters. The trend of variations of thermodynamic parameters is similar to those reported for the similar molecules in the literature [17-18].

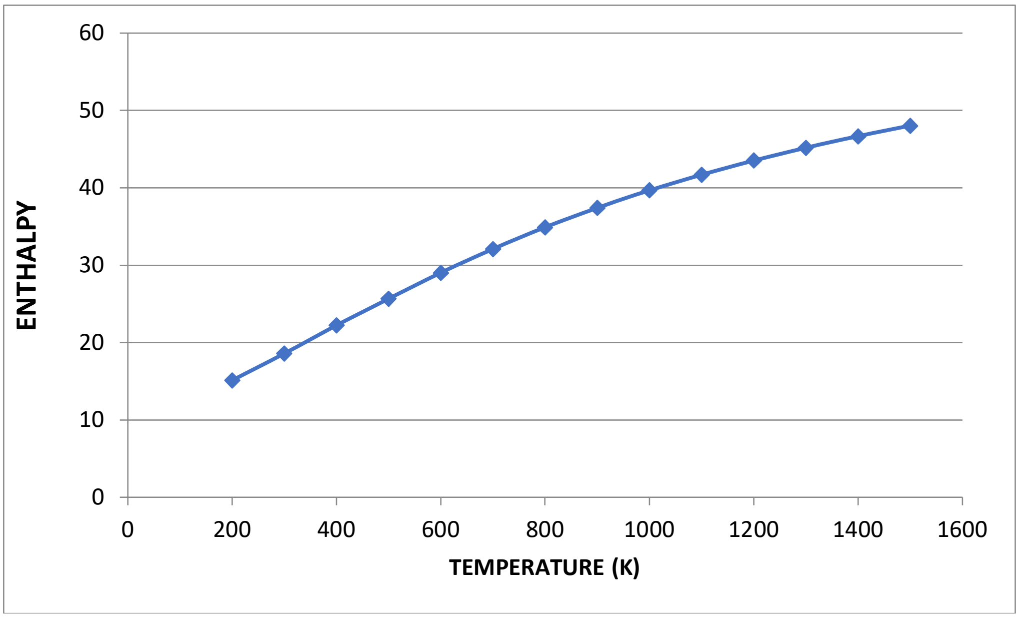

Figure 1 : Variation of enthalpy function with absolute temperature of 5-bromo-2-3-dihydroxy pyridine

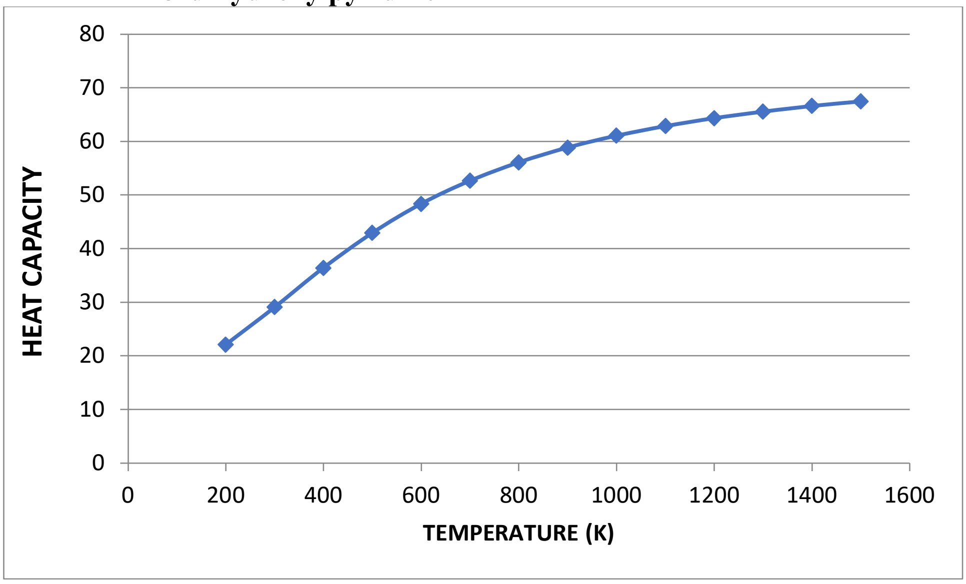

Figure 2 : Variation of heat capacity with absolute temperature of 5-bromo-2-3-dihydroxy pyridine

TABLE 1
THERMODYNAMIC FUNCTIONS OF 5,2,3-BDHP
(CAL./MOLE-K)

TEMPERATURE (K)	$(H^o – E^o_o)/T$	C_p^o
200	13.78	22.47
300	17.99	30.12
400	21.80	36.66
500	25.40	42.20
600	28.59	46.79
700	31.47	50.59
800	34.06	53.75
900	36.40	56.39
1000	38.51	58.61
1100	40.43	60.49
1200	42.17	62.08
1300	43.75	63.44
1400	45.20	64.61
1500	46.53	65.61

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"Floristic Composition and Diversity Patterns in Utnoor Forest: A Comprehensive Study"

Vara Prasad Rao V, Research Scholar, Swami Ramanand Teerth Marathwada University

Dr H M Lakde, Research Supervisor, Swami Ramanand Teerth Marathwada University

Abstract:

The floristic composition and diversity trends in the Utnoor Forest in the Adilabad District, Telangana, are thoroughly evaluated in this paper. Despite the Utnoor Forest's ecological significance and great biodiversity, there aren't many in-depth research on its flora. In this paper carried out a comprehensive inventory of plant species inside the forest region by in-depth field surveys, vegetation sampling, and taxonomic identification. A wide range of plant species, including climbers, shrubs, trees, and herbs, are shown by our investigation to represent different habitat types and ecological niches. Here examined species richness, abundance, patterns of distribution, and community structure in order to determine the fundamental elements affecting the floristic composition of the forest. Furthermore, evaluated the state of endemic and vulnerable species conservation, emphasizing the need of protecting hotspots for biodiversity in the Utnoor Forest. The results of this study provide important new information for attempts to conserve biodiversity and manage the region's forests sustainably. They also advance our knowledge of the ecological dynamics and conservation priorities in the Utnoor Forest ecosystem.

Keywords: Utnoor Forest, Floristic Composition and Diversity Patterns.

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EXPLORATION OF *INDIGOFERA PROSTRATE* AGAINST OXIDATIVE STRESS AND EVALUATION FOR NEUROPROTECTION IN CHEMICALLY INDUCED NEUROTOXIC RATS

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Abstract

Objective: The goal of the current study was to assess the effect of *Indigofera prostrate* on memory and spatial learning induced by a Bisphenol A (BPA) in experimental rats and how *I. prostrate* helps to mitigate these effects.
Methods: The methanolic seed extract of *I. prostrate* was prepared, and subjected to phytochemical constituents' analysis. Wistar Albino rats weighing 150 + grams were divided into 5 groups –Control, positive control, standard drug and test drug treated groups (200 & 400 mg/kg). *In vitro* and *in vivo* anti-oxidant methods were employed to evaluate the anti-oxidant property of *I. prostrate*. The behavioural paradigm of animals was analysed by using models like elevated plus maze, Y maze and actophotometer. At the end of the experiment, the brain tissue was isolated and evaluated for anti-oxidant enzymes.
Results: The *in vitro* anti-oxidant enzyme activity was evaluated by DPPH, ABTS and metal chelating assay and the free radical scavenging property of the test extract was proven with the IC50 values and the % inhibition. There was an improved behavioural pattern with the treatment of the test drug in the above-mentioned models, all the values were found to be significant (**$p<0.001$). Furthermore, when the oxidative stress and anti-oxidant level was assessed by biochemical tests like MDA (Malondialdehyde), SOD (Superoxide dismutase) and catalase, there was an increased levels of anti-oxidant enzymes in a significant manner (**$p<0.001$). Conclusions: It was concluded that *I. prostrate* showed a remarkable effect on behavioural pattern, exhibited anti-oxidant effect on oxidative stress induced by BPA.
Key words: Anti-oxidative enzymes, Bisphenol A, *Indigofera prostrate,* oxidative stress, phytocomponents

1. Introduction

Endogenous increased intracellular reactive oxygen species (ROS) that are deleterious to lipids, proteins, and DNA tend to end up with oxidative stress[1]. A plethora of diseases have been linked to oxidative stress. Elevated ROS, however, also serve as signalling molecules in redox biology,

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which preserves physiological processes. As a consequence of aerobic metabolism and defence mechanisms free radicals are generated normally in the biological system, these free radicals form as a subset of ROS[2]. There are various reasons of creation of free radicals such as radiation, smoke and environmental hazards. It was identified that ROS has positive effects such as supporting immune system, promotes apoptosis and inhibits carcinogenesis[3]. However, it also causes harmful effects like, carcinogenesis, heart-related diseases, brain-related disorders and neurotoxicity. Mechanism-based therapeutics for oxidative stress is sceptical, hence thorough investigation needed to analyse the pharmacodynamic characteristics of a drug so that it gains therapeutic efficacy[4]. Pertaining to pathophysiological aspects of neurogenerative disorders, there is always an intricate interaction of various general and disease-specific variables in the neuronal degeneration process. Key elements in the genesis of neuropsychiatric disorders include an increase in oxidative and nitro-oxidative stress as well as a decrease in the brain's antioxidant capacity[5]. To combat the oxidative stress and subsequently prevent the neurodegenerative diseases, anti-oxidants are used adequately both as a part of treatment and also stand as a source of protection for the neuro-based ailments. The effect of anti-oxidants might be because of free radical trapping, thus delivering neuroprotection. Suppression of oxidative stress and neuroinflammation by anti-oxidants could find a way for the emergence of novel therapies, also motivates research in this aspect so that a promising treatment and prevention could be possible[6].

Since ancient times, herbal medicine and its active components have been a reliable source of healthcare. Concerns have been expressed about the need to investigate the best source of medicine using contemporary research, technology, and concepts due to the rise in diseases, treatment resistance, and desire for medications with minimized side effects[7]. Plants are the finest option for innovative medicinal sources that multinational pharmaceutical corporations are searching for. Over the past few decades, herbal products have become more and more popular all over the world. These days, preclinical and clinical investigations favour herbal medicines with well-defined components over crude forms because of their consistency[8].A lifelong dependency on medication becomes mandatory in chronic ailments and the majority of them belong to neuro-related ailments. Hence, it is always better to choose such a medication which is safe, with minimum side effects and used for long time. Long-term usage of medicinal plants in conventional medicine, including folk remedies, has been shown to be a reliable source of active chemicals and is usually regarded as safe and effective in preventing a wide range of ailments[9].

Endocrine-disrupting chemicals (EDCs) such as bisphenol-A (BPA) are widely used in dental sealants, plastics, thermal sheets, food packaging, and other products. Although BPA is widely distributed in the air, soil, water, and dust, food is the main way that people are exposed to it. Additionally, metabolites are found in over 90% of urine samples from general people across various nations and regions. An epidemiologic data has demonstrated a link between BPA exposure and the risk of several illnesses, such as autoimmune or inflammatory response-related diseases, brain and nervous system abnormalities[10].

The blood-brain barrier is easily crossed by BPA. The detrimental effects of BPA on the neurological system are widely known. It acts by affecting the hippocampus in the limbic system, thus causing deficit in learning and memory, along with the spatial navigation. Besides this effect, it results in a range of behavioural alterations linked to increased aggression, hyper reactivity,

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learning impairments, and increased drug dependency[11]. A study on rats revealed that at low dose there was no effect on the F1 and F2 developmental landmarks, open-field behaviour, cognitive tasks and brain weights. However, few research studies explored the learning and memory deficits in SD rats during their embryonic development on exposure to the BPA administration, but still the mechanism needs an elucidation. A broad category of naturally occurring substances having the ability to reduce or scavenge radicals is referred as plant-derived antioxidants. Pharmacologists, doctors, and scientists alike pay close attention to these substances because of their powerful medicinal and preventative properties[12].

Indigofera prostrate belongs to Fabaceae family, has spread branches. Indigofera is a broad genus that has shown unique features that make it a promising candidate for perennial crops. Different species differ greatly from one another, this variation include differences in fruit type, flowering shape, and pericarp thickness[13]. The present study included *in vitro* anti-oxidant and neuroprotective activity of methanolic extraction of *I. prostrate* in experimental rats.

2. Materials and Methods

2.1. Plant Material

From the local place of Tirupati town, Andhra Pradesh, seeds of *Indigofera prostrata* were obtained and were authenticated by Dr. K. Madhava Chetty, Department of Botany.

2.2. Extraction by Maceration

About one kg of fresh seeds of *I. prostrate* were cleaned and shade dried, and grounded, kept 7 days in methanol for maceration with occasional stirring. The content was filtered and dried in a desiccator on 8th day, then used for further analysis.

2.3. Preliminary Phytochemical Analysis

The phytochemical constituents like carbohydrates, amino acids, proteins, and lipids, and secondary metabolites, such as alkaloids, tannins, phenols, flavonoids, saponins, steroids, glycosides, and resins were analyzed in methanolic extract of *I. prostrate* by means of standard procedures[14].

2.4. Gas Chromatography-Mass Spectrometry (GC-MS) Analysis

Using a 7890A gas chromatograph system (GCMSQP2010, SHIMADZU) and mass spectrophotometer, fixed with a HP-5 MS fused silica column (5% phenyl methyl siloxane 30.0m ×250μm, film thickness 0.25μm), interfaced with 5675C Inert MSD with Triple-Axis detector was used. Helium was used as carrier gas with a1.0ml/min flow, temperature of 250°C; interface temperature at 300°C; pressure16.2 psi. Split mode injector of 1μl with split ratio of 1:50, injection temperature of 300 °C was maintained. Temperature in the column was raised to 4 °C per minute after five minutes at 150 V, was maintained up to 250°C, elution time was 37 minutes. Average peak area was compared to total area and relative percentage was calculated[15].

2.5. Identification of Compounds

Database of National Institute of Standards and Technology (NSIT) which had > 62,000 patterns of known compounds was utilized for the interpretation of mass spectrum, and identification of components according to retention indices. The spectra of the unknown components of *I. prostrate* fraction obtained were compared with the standard mass spectra of known components.

2.6. Analysis of MEIP by *In vitro* Antioxidant Assays

2.6.1. DPPH Radical Scavenging Assay

In this assay, to 6 ml of methanolic solution of DPPH (33 mg/l) in a test tube, various concentrations of the plant extract or standard (2 ml) were added, then the reaction mixture was incubated for one hour at 25^0C.Triplicate values of absorbance were measured at 517 nm in a UV-Visible Spectrophotometer. Ascorbic acid was used as standard drug. The % inhibition (I %) was calculated by formula[16].

$$I\ \% = (Abs_{control} - Abs_{sample}) / Abs_{control} \times 100$$

2.6.2. ABTS Radical Scavenging Activity

ABTS 2 mM (0.0548 gm in 50 ml) and potassium per sulphate70 mM (0.0189 gm in 1ml) were prepared in distilled water. Then, mixed with 200 ml of potassium per sulphate and 50 ml of ABTS, left aside for 2 h. To 0.6 ml of ABTS radical cation and 3.4 ml of phosphate buffer (pH 7.4) were added, various concentrations of plant extract (or) standard were added, and triplet values of absorbance was recorded at 734 nm. Ascorbic acid was used as a standard. The percentage of inhibition (I %) was calculated using following formula[17].

$$I\ \% = (Abs_{control} - Abs_{sample}) / Abs_{control} \times 100$$

2.6.3. Metal Chelating Assay

In this assay, with continuous shaking, 0.2 ml of 2 mM ferric chloride and 0.4 ml of ferrozine solution were added to various concentrations of extract, and kept aside for 10 minutes at room temperature. Triplicate values of absorbance were recorded at 562 nm. EDTA was used as standard. The percentage inhibition (I %) was calculated using following formula[18].

$$I\ \% = (Abs_{control} - Abs_{sample}) / Abs_{control} \times 100$$

2.6.4. Acute Toxicity Tests

Wistar Albino rats (200-250gm) of either sex were split in to 8 groups of 6 animals each. A minimal dose of 50mg/kg up to maximum of 2000mg/kg of the test extract was administered orally according to the guidelines. There were no visible symptoms of toxicity or mortality. A dose of $1/5^{th}$ and $1/10^{th}$ of the maximum concentration was chosen for the study[19].

2.7. Animals

Wistar albino Rats weighing 150±5 g were procured from National Institute of Nutrition, Hyderabad, Telangana, India. The animals were kept in a temperature-controlled (22 ± 5 °C) environment with a 12-hour light-dark cycle, 45–55 percent humidity, and a normal pellet meal

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and water available to them at all times.

2.8. Experimental Protocol

The animals were divided into 5 groups of 6 in each. Group I serve as control was administered with 2 ml of normal saline. Group II was administered with BPA 50 µg/kg for 21 days, Groups III-V was also administered with BPA. Standard drug treated group was group III (piracetam 200mg/kg, i.p). Test drug treated groups were Group IV and V, treated with MEIP (200 and 400 mg/kg orally). After the treatment, behavior performance in rats was analyzed and sacrificed for further estimations.

Table 1. Grouping of animals

Group I	Control
Group II	BPA (50 µg/kg)
Group III	Piracetam (200 mg/kg)
Group IV	MEIP (200 mg/kg)
Group V	MEIP (400 mg/kg)

2.9. Assessment of Neurobehavioral Activity

2.9.1. Elevated Plus Maze Method (EPM)

In this model, anxiogenic property was examined with the animal spending more time in closed spaces. The '+' shaped apparatus had two enclosed and open arms uplifted above the ground. At the junction of the four arms each rat was placed individually and allowed to explore all the four arms. The time spent in both the arms as an indication of anxious nature of an animal was recorded[20].

2.9.2. Y MAZE Spontaneous Alternation Test

Learn and remember was analyzed by 'Y' shaped apparatus with 120° angle. Exploration of the animal was done by placing at the junction for 5 minutes; animal with good remembering ability was analyzed and recorded. The number of entries and alterations were recorded and percentages of alteration were calculated[21].

2.9.3. Actophotometer Test (Locomotor Count)

Using this apparatus, the mental alertness (or) wakefulness of the animals was evaluated. It possesses photoelectric cells and light beam passed through the photo cell was recorded by the animal as it passes, also indicated as a count of locomotor activity[22].

2.10. Estimation of Biochemical Parameters and Enzyme Activity

After the animals were sacrificed, brain tissues were isolated, washed with ice-cold saline at the

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end of the experiment and preserved at −80°C.

2.10.1. Analysis of Anti-oxidative Enzymes

The brain tissue (hippocampus and cortex) was homogenized in about 10 ml of ice cold 0.1 M phosphate buffer solution (pH 7.4) in a homogenizer. As Malondialdehyde (MDA) remains as a marker for lipid peroxidation, MDA on reaction with thiobarbituric acid reactive substances (TBARS), delivers pink color at an absorbance of 540 nm as described by Ohkawa et al in 1979. By means of method described by Aebi (1983), catalase (CAT) estimation was done, reduced glutathione was measured by method of Ellman[23,24,25].

2.10.2. Estimation of Acetylcholinesterase Activity in Brain Homogenate

With few modifications Ellman et al method was followed. A mixture of 0.1 ml supernatant (obtained from brain homogenate), sodium phosphate buffer (2 ml of 0.1 M at pH 8.0) with 0.1% BSA was prepared, then added 0.1 ml dithio-bis-nitrobenzoic acid (DTNB) and 0.05 ml of acetylthiocholine iodide (AChI). Absorbance at 412 nm was noted using UV-VIS Spectrophotometer. Acetylthiocholine iodide hydrolyzed per min per mg protein in micromoles was considered as the concentration of acetylcholinesterase activity[26].

2.11. Statistical Analysis

Each group (n=6) value was represented in Mean ± SEM. One way ANOVA followed by Dunnett's test was performed to find out the statistical significance. $^{**}P<0.01$ denoted significant statistically.

3. Results and Discussion

The preliminary phytochemical screening was analyzed in the methanolic extract of *I. prostrata* (MEIP) as depicted in the Table 2. Table 3 consists of bioactive compounds of MEIP.

Table 2. Phytochemical constituents of methanolic extract of *Indigofera prostrata* (MEIP)

Name of the Phytochemical constituent	MEIP
Carbohydrates	+
Amino acids	+
Proteins	+
Alkaloids	+
Cardiac glycosides	+
Triterpenoids	+
Saponins	+

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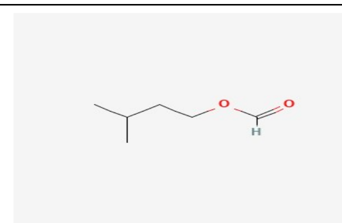
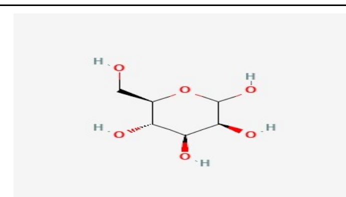
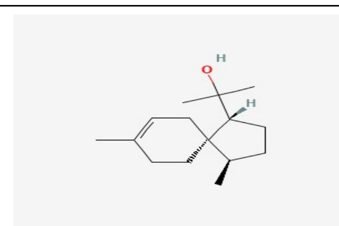
Flavonoids	+
Phenolic compounds	+
Tannins	+
Steroids	+
Gums	-

+ means present and - means absent

Table 3. Bioactive compounds of Methanolic extract of *Indigofera prostrate* (MEIP)

S. No	R. Time	Area (%)	Name of the component	Molecular Formula	M.W g/mol	Compound structure
1	6.494 min	19.34	1-Butanol, 3-methyl-, formate	$C_6H_{12}O_2$	116.16	
2	15.246 min	8.06	d-Mannose	$C_6H_{12}O_6$	180.156	
3	19.621 min	0.59	β-Acorenol	$C_{15}H_2O_6$	222.37	

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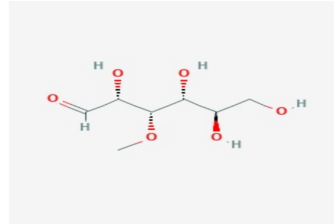
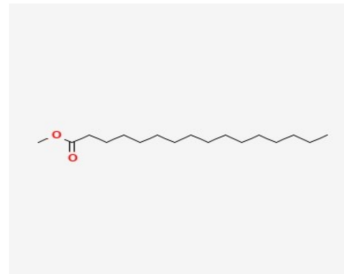
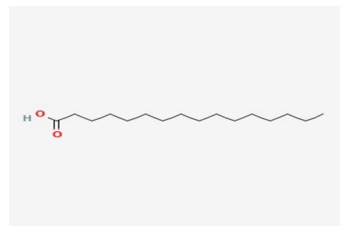
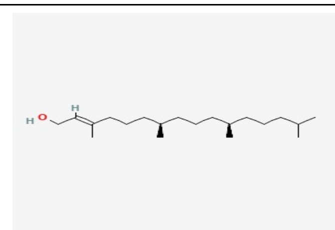
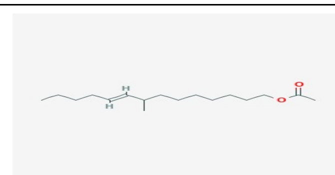
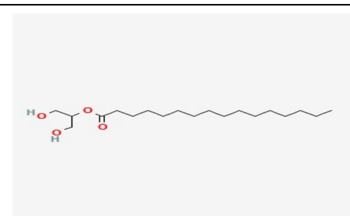
4	24.797 min	7.55	3-O-Methyl-d-glucose	$C_7H_{14}O_6$	194.18	
5	26.091 min	1.56	Hexadecanoic acid, methyl ester	$C_{17}H_{34}O_2$	270.5	
6	27.191 min	6.49	n-Hexadecanoic acid	$C_{16}H_{32}O_2$	256.42	
7	rt: 30.623 min	4.70	Phytol	$C_{20}H_{40}O$	296.5	
8	rt: 33.580 min	0.79	E-8-Methyl-9-tetradecen-1-ol acetate	$C_{17}H_{32}O_2$	268.4	
9	rt: 37.950 min	4.11	Hexadecanoic acid, 2-hydroxy-1-(hydroxymethyl) ethyl ester	$C_{19}H_{38}O_4$	330.5	

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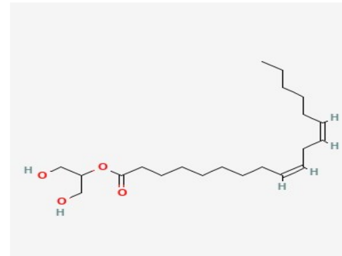
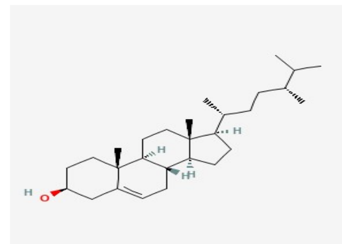
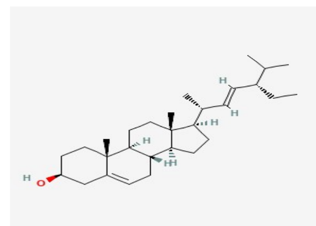
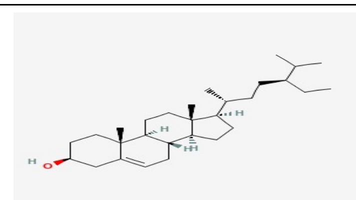
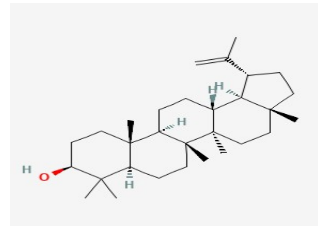
10	40.719 min	5.43	9,12-Octadecadienoic acid (Z,Z)-, 2-hydroxy-1-(hydroxymethyl) ethyl ester	$C_{21}H_{38}O_4$	354.5	
11	47.989 min	1.21	Campesterol	$C_{28}H_{48}O$	400.7	
12	48.395 min	6.42	Stigmasterol	$C_{29}H_{48}O$	412.7	
13	49.133 min	12.59	γ-Sitosterol	$C_{29}H_{50}O$	414.7	

14	50.214 min	8.35	Lupeol	$C_{30}H_{50}O$	426.7	

The chromatogram of GC-MS displayed in Figure 1. Component name, Retention Time (RT), atomic equation, Molecular weight (MW) and Area (%) in MEIP was displayed in Table 3. The following bioactive compounds were present in the GC-MS analysis carried on methanolic fraction of *I. prostrta* was found the following bio active compounds 1-butanol, 3-methyl-, formate, d-mannose, β-acorenol, 3-O-methyl-d-glucose, hexadecanoic acid, methyl ester, n-hexadecanoic acid, phytol, E-8-methyl-9-tetradecen-1-ol acetate, hexadecanoic acid, 2-hydroxy-1-(hydroxymethyl)ethyl ester, 9,12-octadecadienoic acid (Z,Z)-, 2-hydroxy-1-(hydroxymethyl)ethyl ester, campesterol, stigmasterol, γ-sitosterol, and lupeol**.**

<<Insert Figure 1 here>>

Figure 1. Analysis of components in methanolic extract of *Indigofera prostrata*

3.1. Acute Toxicity Tests

These particular studies revealed the innocuous nature of MEIP. At a dose of 2000 mg/kg, neither fatality nor significant adverse effects were detected, which suggests that the plant extract is safe.

3.2. *In vitro* Antioxidant Assays

3.2.1. DPPH Radical Scavenging Assay

The reaction between DPPH and odd electron initiates purple color, with an absorption at 517 nm. An anti-oxidant reacts with DPPH and forms DPPHH, with a lower absorbance, causes decolorization (identified by yellow color), as evident with an increase in number of electrons. The test extract produced 61.24 % of inhibition as compared to the ascorbic acid. The IC_{50} value was recorded as 40.04 µg/ml for the test extract while 27.18 µg/ml was observed for standard drug Ascorbic acid (Table 4, Figure 2).

Table 4. Effect of MEIP on DPPH free radical scavenging assay

Name of the drug	Concentration(µg/ml)	% Inhibition	IC_{50} Value
Methanolic extract of *Indigofera prostrata*	25	30.16±1.32	
	50	35.72±1.54	

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	100	41.85±2.65	40.04 μg/ml
	200	50.59±2.42	
	400	61.24±2.43	
Ascorbic acid	25	14.16±1.42	27.18 μg/ml
	50	21.22±1.65	
	100	28.88±2.75	
	200	39.95±2.64	
	400	54.18±2.43	

<<Insert Figure 2 here>>

Figure 2. Free radical scavenging effect of MEIP in DPPH assay

3.2.2. ABTS Radical Scavenging Assay

On addition of potassium per sulfate, ABTS got converted to its radical cation. The ABTS radical cation counteracted with anti-oxidant nature of the test extract. During this reaction, the blue clor ABTS radical was converted to colorless neutral form. The IC_{50} values of the MEIP (Methanolic extraction of *I. prostrata)* was found to be 58.01 μg/ml. IC_{50} value for the Vitamin C (Standard) was found to be 49.76 μg/ml, presented in Table 5 & Figure 3.

Table 4. Effect of MEIP on ABTS radical scavenging assay

Name of the Compound	Concentration (μg/ml)	% Inhibition	IC_{50}
Methanolic extract of *Indigofera prostrata*	25	45.25 ±2.43	58.01 μg/ml
	50	52.81±2.65	
	100	59.75±2.62	
	200	71.21±2.76	
	400	91.77±3.87	
Ascorbic acid	25	36.73±2.43	49.76 μg/ml
	50	42.63±3.21	
	100	51.69±2.76	
	200	62.18±2.85	

400	78.11±2.97

<<Insert figure 3 here>>

Figure 3. Free radical scavenging effect of MEIP in ABTS assay

3.2.3. Metal Chelating Assay

Excess free iron was linked to the production and stimulation of free radicals in biological systems. Metal chelating assay was employed to test the medicinal plant extracts. Different concentrations from 25 – 400 µg/ml of test extract were tested and the % inhibition was recorded, the test concentrations showed a potent chelating property in concentration-dependent manner. The IC_{50} values of the MEIP was found to be 36.16 µg/ml as compared to the standard (32.47 µg/ml), presented in Table 5 & Figure 4.

Table 5. Metal chelation assay of MEIP

Name of the compound	Concentration (µg/ml)	% Inhibition	IC_{50}
MEIP	25	18.64±2.42	36.16 µg/ml
	50	23.19±2.54	
	100	31.48±2.76	
	200	39.09±3.25	
	400	51.21±3.87	
EDTA	25	21.23±1.42	32.47 µg/ml
	50	27.11±1.87	
	100	33.39±2.23	
	200	42.73±1.71	
	400	54.18± 1.23	

<<Insert figure 4 here>>

Figure 4. Metal chelation assay of MEIP

3.3. Evaluation of Test Extract in the Behavioral Paradigm

The locomotor activity of the test extract was evaluated in the Actophotometer. The number of crossings, denoted by locomotor score made by each animal was recorded. Decreased locomotor

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score was found in the disease – induced animals, taken as indication of CNS depression. The test drug at the dose of 200 & 400 mg/kg showed a significant (**P<0.01) in the promotion of locomotor score in seconds as displayed in Table 6 & Figure 5.

Table 6. Effect of MEIP on Spontaneous locomotor activity in Actophotometer

Groups	Treatment & Dose	Locomotive score (sec) in days		
		3rd day	5th day	7th day
I	Control	380±3.9	392±1.32	384.33±1.34
II	Disease control	184±2.13**	160±1.05**	142.41±0.24**
III	Standard	164±2.41**	215±0.04**	242.38±0.73**
IV	MEIP 200mg/kg	149±2.19**	181±2.19**	209.32±1.29**
V	MEIP 400mg/kg	162±2.17**	210±2.31**	236.24±1.28**

Values were interpreted in Mean ± SEM; **p<0.01 was considered as significant when the test drug treated groups were compared with the disease control

<<Insert figure 5 here>>

Figure 5. Effect of MEIP on Spontaneous locomotor activity in Actophotometer

In the elevated plus maze, disease induced group animals spent reduced in time in open arm while time spent in closed arm was raised, because of dislike of animal to get explored to open arms. On treatment with the test drug at the dose of 200 and 400 mg/kg, there was an increased time spent in open arm with a declined fear, as compared to the time spent in closed arms. All the values were found to be significant (**P<0.01).

Table 7. Effect of MEIP on anxiogenic behavior in Elevated plus maze

Groups	Treatment& Dose	Time spent in closed arm in sec	Time spent in open arm in sec
1	Normal control	221.6±1.47	20.0±1.01
II	Disease control	146.6±1.67**	53.3±1.34**
III	Standard	127.8±1.46**	81.7±1.9**
IV	MEIP 200mg/kg	131.62±1.34**	61.3±1.44**
V	MEIP 400mg/kg	129.53±1.53**	78.23±2.09**

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Values were interpreted in Mean ± SEM; **p<0.01 was considered as significant when the test drug treated groups were compared with the disease control

<<Insert figure 6 here>>

Figure 6: Effect of MEIP on anxiogenic behavior in Elevated plus maze

In the Y maze test, each rat was placed individually and the entry of rat in the three different arms was noted which was called as spontaneous alternation (Table 8). The percentage of alternation was calculated using the below formula;

$$Percentage\ of\ alteration = \frac{Spontaneous\ alteration}{Total\ number\ of\ arm\ entries - 2} X\ 100$$

During the recording of alternations each time, each rat was placed for 5 minutes after a thorough cleaning with 5% ethanol to avoid any bad odor.

Table 8. Effect of MEIP on spatial learning in Y maze

S. No	Treatment	% of alternations
1	Normal control	13.5±2.86
2	Disease control	5.1±0.59
3	Standard	1.62±0.24**
4	MEIP 200mg/Kg	2.13±0.72**
5	MEIP 400mg/Kg	3.41±1.26*

Values were interpreted in Mean ± SEM; **p<0.01 was considered as significant when the test drug treated groups were compared with the disease control

Acetyl Cholinesterase (AchE) enzyme in brain homogenate of the disease induced animals exhibited increase in the concentrations significantly (**p<0.001). With the treatment of test extract at 200 and 400 mg/kg produced decreased levels significantly, thus overcome the damage by free radicals (Table 9).

Table 9. Effect of MEIP on Acetyl Cholinesterase enzyme activity in brain

Treatment & Dose	Acetyl cholinesterase enzyme activity in brain (moles x10^{-6}/min/ g of tissue)
Normal control (Distilled Water)	30.31 ± 0.76

Disease control	43.56 ± 0.612
Standard control	14.23 ± 0.542**
MEIP 200mg/kg	21.16 ±0.428**
MEIP 400mg/kg	15.72 ±0.577**

Values were interpreted in Mean ± SEM; **p<0.01 was considered as significant when the test drug treated groups were compared with the disease control

In the determination of anti-oxidant enzymes in the brain homogenate, it was noticed that there was an increase in the Malondialdehyde (MDA) levels, which is considered as a lipid peroxidation marker in disease induced animals. Also, the levels of reduced glutathione and catalase enzyme were reduced in the positive control rats. After the treatment with the test drug at the dose of 200 and 400 mg/kg, there was a decrease in the MDA levels, rise in reduced glutathione and catalase enzymes significantly (**p<0.01, Table 10 & Figure 7).

Table 10. Effect of MEIP on Anti-oxidant enzymes - Lipid peroxidation, reduced glutathione and Catalase

Groups and Treatment	MDA (µm/mg tissue)	Reduced glutathione (µm of GSH/mg tissue)	Catalase (units/mg protein)
Normal control	2.853±0.97	4.22±0.54	6.72±0.49
Disease control	5.233±0.24	2.90±0.13	3.45±0.31
Standard control	2.965±0.22**	3.61±0.45**	5.63±0.15**
MEIP 200mg/kg	3.674±0.63**	3.34±0.14**	6.59±0.54**
MEIP 400mg/kg	3.112±0.35**	3.43±0.45**	7.62±0.74**

Values were interpreted in Mean ± SEM; **p<0.01 was considered as significant when the test drug treated groups were compared with the disease control

<<Insert figure 7 here>>

Figure 7. Effect of MEIP on anti-oxidant enzyme levels in brain homogenate

4. Discussion

The process of neurodegeneration is connected to both brain aging and neuropathological disorders. Brain pathology, namely neurodegenerative and cerebrovascular diseases, is recognized as a major global cause of death, accounting for 8% of all deaths[27]. In the twenty-first century, cognitive dysfunction is considered as a significant health issue with a number of neuropsychiatric and neurodegenerative disorders, including depression, schizophrenia, dementia from Alzheimer's

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disease (AD), cerebrovascular impairment, parkinsonism, and others, can have a severely debilitating effect on one's ability to function[28]. There exist few techniques and corresponding mechanisms that safeguard and rescue central nervous system (CNS) from harmful aspects such as neuropathological conditions and aging of brain. There is a dissatisfaction in an individual and also family who are suffering from deficiency of alternative therapeutic options[29]. This drives investigations into the causes of neuronal death and the development of novel drugs to regulate it.

It was also noticeable that once neurodegenerative diseases develop, they last long and permanent. There are currently no effective treatments for neurodegenerative illnesses that both assist the body's afflicted parts repair and recover from ongoing neurodegeneration. Therapeutic herbs in Indian system of medicine have demonstrated an encouraging and promising neuro-psycho-pharmacological activity. Long term use is acceptable as the traditional medicines possess minimum side effects and drug-drug interactions[30]. Correspondingly, many medicinal plants have unique therapeutic effects without adding nourishment to the diet and can be utilized either temporarily or permanently to treat a variety of health issues. Hence, might be a reduced risk for few neuro-related diseases that cause neuronal dysfunction for those who include and consume higher consumption of fruits and vegetables. While the exact mode of action of herbal medicines is still unknown, many of them have been demonstrated to exhibit anti-oxidant and/or anti-inflammatory properties[31].

In the current study, the focus was on the anti-oxidant activity exhibited by herbal drug oxidative stress stands as one of the contributing factors in the etiopathogenesis of both neurodegenerative and neurological diseases. As a consequence of oxidative stress, neuro-inflammation precedes resulting from neuroglial activation at the level of neurons, microglial cells, and astrocytes. Antioxidants derived from phytochemicals may play both neurodegenerative (by decreasing the loss of neurons) and neuroprotective (by preventing apoptosis) functions by minimizing or reversing cellular damage[32].

BPA is an endocrine disrupter, presents a structural similarity with human oestrogen, alters learning and memory, as it crosses blood brain barrier causes cognitive impairment and aggressiveness. In the present study, BPA was administered to the experimental rats, and were investigated by treatment with the herbal drug, also aided to prove the efficacy of the test drug[33]. The toxic effects of BPA lead to decreased expression of NMDA receptors.In the assessment of anti-oxidant effect of test extract, the test drug was proven to scavenge the free radicals thus attained antioxidative potential[34,35].

In the behavioural paradigm, the anxiogenic behaviour and locomotor activity of animals was reduced in test drug treated rats, as evident with the screening in Actophotometer, elevated plus maze and Y maze respectively. In the evaluation of anti-oxidant enzymes by *in vivo* techniques, the levels of MDA, catalase and SOD of test extract presented efficiency in scavenging the amplified ROS generated in brain tissue. Thus, the involvement of oxidative stress in BPA induced cognitive impairment was assessed, in evaluation of levels of MDA, catalase and SOD in the brain. In the stress condition, increased levels of MDA, which subsequently lead to remarkable increased

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LPO levels, was observed in the BPA intoxicated rats as compared to control. This aspect was consistent with several studies that showed increased production of reactive oxygen species (ROS) in the brain and lower levels of endogenous antioxidants in the liver and epididymal sperm upon exposure to BPA[36]. On treatment with the test drug, the test drug produced alleviating effect on the oxidative stress as proven by the levels of anti-oxidant enzymes in the brain tissue. Thus, MEIP acted as a potent anti-oxidant agent, regulating the level of endogenous antioxidants, which are usually depleted as a result of aggravated oxidative stress. The anti-oxidant effect of the methanolic extract of *I. prostrate* was due to the presence of flavonoids and phenolic compounds, also due to the functional groups, configuration and hydroxyl groups that was attributed to the free radical scavenging property.

5. Conclusion

According to the study, giving *I. Prostrate* helped to improve the behavioural abnormalities brought on by BPA. In addition, treatment with *I. prostrate* may have upregulated NMDA receptors in the hippocampal region and demonstrated antioxidant properties while enhancing the brain's natural antioxidant enzyme levels. On basis of these, *I. prostrate* dramatically reduced BPA-induced oxidative stress, which may have therapeutic benefits for cognitive dysfunction, one of the very common symptoms of several neurodegenerative illnesses.

6. Conflicts of Interest

No conflict of interest.

7. Author Contributions

N.I conducted the investigation, collected data, and wrote the manuscript following statistical analysis. KSG helped develop the topic, design, supervise, correct, and approve the text.

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