



AN ALMANAC OF MULTIDISCIPLINARY RESEARCH PERSPECTIVE

Edited by

**Dr.J.KARTHIKEYAN | Dr.M.MOHAN BABU
Dr.G.ANANDA REDDY | Dr.R.VASANTHAN**

ABOUT THE BOOK

This book provides an original perspective on a range of controversial issues in the field of Engineering, Management, Science, Arts and Humanities through case studies of multi-disciplinary and mixed-method research involving researchers "across disciplines" explore a range of interesting issues, including the relevance of research approaches to very different settings, and to the kinds of questions being asked. Every chapter concludes with practical recommendations informed by theory and research to guide policymakers, researchers, and industry personals as they seek to understand, design, and implement better systems. This book meets the needs for a basic, yet comprehensive and up-to-date, introductory text for multi disciplines.



Published by
L'ORDINE NUOVO PUBLICATION
philo.balki@gmail.com
www.nuovopublication.com

ISBN 939299547-4



9 789392 995477

**AN ALMANAC OF MULTIDISCIPLINARY
RESEARCH PERSPECTIVE**

AN ALMANAC OF MULTIDISCIPLINARY RESEARCH PERSPECTIVE

Edited by

Dr.J. KARTHIKEYAN | Dr.M. MOHAN BABU
Dr.G. ANANDA REDDY | Dr.R. VASANTHAN

Published by

L ORDINE NUOVO PUBLICATION

philo.balki@gmail.com

www.nuovopublication.com

Book Title : **AN ALMANAC OF MULTIDISCIPLINARY RESEARCH PERSPECTIVE**

Editors : **Dr.J. KARTHIKEYAN**

Professor of English & Dean, Career Development
Sri Venkateswara College of Engineering & Technology
Chittoor, Andhra Pradesh

Dr.M.MOHANBABU

Principal
Sri Venkateswara College of Engineering and Technology (Autonomous)
Chittoor, Andhra Pradesh, India

Dr.G.ANANDA REDDY

Principal, PVKN Government College (Autonomous)
Chittoor, Andhra Pradesh, India

Dr.R.VASANTHAN

Associate Professor & Head, Department of English (UAP)
National College (Autonomous), Trichy, Tamilnadu, India

Book Subject : MULTIDISCIPLINARY

Book Category : Chapter Edited Volume

Copy Right : Publisher

First Edition : April 2023

Book Size : B5

Paper : 21 kg, Maplitho NS

Price : Rs.800/-

Published by : **L ORDINE NUOVO PUBLICATION**

E-mail: philo.balki@gmail.com

www.nuovopublication.com

Mobile:99442 12131.

ISBN Supported by

Raja Ram Mohan Roy National Agency for ISBN, New Delhi – 110066 (India)

ISBN: 978-93-92995-47-7



Disclaimer: *The Publisher and editors cannot be held responsible for errors or any consequences arising from the use of information in this Book; the views and opinions expressed herein are of the authors and do not necessarily reflect those of the publisher and editors.*

Forward

It is with great pleasure that I introduce this book titled "AN ALMANAC OF MULTIDISCIPLINARY RESEARCH PERSPECTIVE," which is a compilation of selected papers presented at the International Hybrid Conference on Science Technology Engineering Arts Humanities & Management, held on 10th and 11th April 2023 at Sri Venkateswara College of Engineering & Technology, Chittoor, Andhra Pradesh.

This conference provided a unique opportunity for students and faculty members from various academic disciplines to come together and share their research perspectives, exchange ideas, and discuss the latest advancements in their respective fields. The papers selected for this book showcase the diversity and breadth of topics covered during the conference, spanning across Science, Technology, Engineering, Arts, Humanities, and Management.

I would like to extend my appreciation to the organizers of the conference, Sri Venkateswara College of Engineering & Technology (A), Chittoor in collaboration with PVKN Government College (A), Chittoor and National College (A), Tiruchirappalli for their efforts in organizing this event. Their collaboration has paved the way for more research collaborations, which is essential in today's world, where interdisciplinary approaches are necessary to address complex problems.

I would like to congratulate the authors whose papers were selected for this book, and I hope that their contributions will inspire others to continue their pursuit of knowledge and research excellence.

Dr. K. Kumar
Principal,
National College, Tiruchirappalli

Editorial

Living in a world of continuous scientific and technological change, teaching professionals and researchers need to be more prepared to effectively integrate themselves into the competitive working environments of the 21st century. Knowledge in designing a product or rendering a service does not form a complete and coherent body of knowledge that can be precisely documented or even articulated by a single individual. Rather, it is a form of knowing that exists only through the interaction among various collective actors (Gherardi & Nicolini, 2000). Existing literature (Kanter, 1988; Nonaka, 1994; Spender, 1998; Starbuck, 1992) has highlighted a need for the development of a diverse workforce if knowledge creation is to be promoted and sustained within organisations. The rising importance of research for the global education has resulted in a significant number of efforts to define and interpret its meaning. This book reveals that a diverse set of resources (experts with different backgrounds and abilities) provides a broad knowledge base at the individual level, offering greater potential for knowledge creation. The main contribution of this book lies in the broadness, completeness and cross-disciplinarily of the literature covered, thus being able to stand as a reference source of knowledge for teachers, researchers, engineers and practitioners.

Contents

S. No	Title	Page No.
1	English Language in India and it's Problems Mr. Mallanna I Biradar	1
2	Need of Multidisciplinary Research in Current Era K. Amrutha & S. Sudhakar Reddy	6
3	Fundamental Research in Science Technology Engineering Arts Humanities & Management Kasula Umamaheswara Rao & M. Padmavathi	10
4	Big Data Analytics: The Hope of Marketing Intellect and Plan S.K. Sathya Hari Prasad & A. Nirosha	12
5	Analysis of Land Usage and Land Cover Changes using Remote Sensing Data In Nellore District Dr. S. Vinila Kumari & M. Ismail	16
6	Exploring the Intersection of Digital Media, Creative Writing, And Reader Engagement Namratha Komatilanka	20
7	Impact of Municipal Solid Waste Management in India N. Uma Devi & Chandra	24
8	From Trauma to Triumph: A Study of Maya Angelou's Auto Biographies Shaik Mohammad Shafiullah	27
9	A Study of Research Topics in Mathematics through Websites: An Empirical Study Smt. P. Kavitha	32
10	Role of Agriculture Marketing in Economic Development of India G. Yamuna & C. Veena	37
11	Role of Experiential Learning-A Learner Centric Pedagogy to Bring Out the Best in Higher Education P. Bhanuprakash, T. Hari Babu & N. Ramamurthy	40

12	Digital Classroom Management and its Techniques J. Mohana Valli	43
13	Intertwisted and Interweaved Lives on Earth Dr. T. Sai Mamata	47
14	Assistance of Technology in Assisting Suicide and Euthanasia Dr. G. Indira Priyadarshini & P. Sowjanya	50
15	Comparison of Public Sector Banks Versus Private Sector Banks: In The Indian Banking Industry K. Mujakar & R. Balakrishna	54
16	ELT at Tertiary Level - Implications for Curriculum Development and Pedagogy Dr. T. T. Prasad Mohan Babu	58
17	Image and Video Recognition by using Machine Learning Mahaboob Basha	63
18	Environmental Concerns in the Select Short Stories of Ruskin Bond Dr. S.V. Ramesh Kumar	67
19	Good Literature is A Good Brick for Character Building Education Dr. M.V. Sulochana	69
20	Successful Women Entrepreneurs: India Dr. P. Jyoshna	72
21	Teaching Writing Skills: Different Approaches Dr. C. Rajyalakshmi	76
22	Rudiments of Language Skills Dr. Lanke Subha	80
23	Phytoremediation of Soil Pollutants for Better Usage in Agriculture L. Md. Bhakshu & C. Meera Saheb	83
24	Use of Iron Oxide Nanoparticles in Current Cell Biology and Experimental Physiology Research Devanand Chaudhari, Dr. Gopal Panda & Dr. S.B. Singh	85

25	Traction Microgrids Unconventional Hybrid System Control Yogesh Shivaji Pawar & Dr. Ashok Kumar Jhala	90
26	Oxidative Stress Responses in Plants Mohano Behara & Saivenkatesh Korlam	95
27	Microalgae in Phycoremediation: An Overview of The Potential and Applications Sujana Papani & Saivenkateshkorlam	102
28	Difficulties Faced by ESL Tertiary Learners in Engineering Colleges of Andhra Pradesh Ms. V. Sujatha	105
29	Difficulties Faced by The ESL Learners in Rural Engineering College S. Nancy Margret	109
30	Analytical Methods to Detect Algal Blooms-Microcystins in Spirulina Dietary Supplements Dr. P. Sivaraagini & Dr. Mohano Behara	112
31	A Methodology for Simulating Torque Ripple Reductions in BLDC Motors Shahuraj S. Sable & Dr. Ashok Kumar Jhala	115
32	Growth Prospects of Edtech Industries in India Pradeepta Kumar Patnaik & Dr. Mohano Behara	118
33	Multivariate Linear Regression Conceptual Model and Applications Dr. V. Munaiah, Dr. S. Chandrababu & Dr. T. Gangaram	120
34	Covid - 19, and its Impact on The Society Dr. Jyotsnarani Panda (Ph.D) & Dr. Mohano Behera	123
35	Deconstructing Cyborgian Identity: A Study Based on the Dystopian World in 'Terminator 3: Rise of the Machines' Milan Kumari Panda & Dr. Jyotsnarani Panda	131
36	हिन्दी लेखिकाओं की कहानियों में नारी चेतना और गरिमा की अभिव्यक्ति डॉ. शेख.बेनज़ीर	134

37	Applications of Mathematics in Various Fields R. Jaya Lakshmi	137
38	Loss of Crop Diversity, it's Consequences and Measures to Restore Dr. A. Sasikala	142
39	Significant Medicinal Plants Used for Dental Care and Oral Care Collected from Ardhagiri Hills A Sacred Grove of Chittoor District M. Hemalatha	144
40	Goods and Service Tax is Boon or Bane for Indian Economy – A Review Dr. V. Masulamani	147
41	Challenges in Enhancing Communication Skills of Engineering Graduates: A Diagnostic Study Dr. Y. Aneel	152
42	Difficulties Encountered by Engineering Students Learning ESL in Engineering Colleges in Andhra Pradesh Dr. R. Devarajulu Reddy	157
43	Proximate Analysis of The Problems and Feasible Solutions Identified by The Teacher and Learners in the Teaching-Learning Process Ms. S. Swathy	163
44	Obstacles Faced by Regional Students In developing Language: An Empirical Study Ms. S. Devayani	167
45	<p>بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ</p> <p>ڈاکٹرای۔ محمد انور حسین</p>	172

CHAPTER 1

ENGLISH LANGUAGE IN INDIA AND IT'S PROBLEMS

Mr. MALLANNA I BIRADAR

Assistant Professor of English
MGVC Arts Commerce and Science College
Muddebihal Disistrict, Vijayapur, Karnataka

Abstract

The English language has been an integral part of India's linguistic history, and its use dates back to the British colonial period. India has a diverse linguistic landscape, and English has served as a unifying language, particularly in the realms of business, education, and governance. However, the use of English in India has not been without its challenges, as it has created a linguistic divide between those who are fluent in English and those who are not. This research article explores the problems associated with the English language in India, the causes of these problems, and possible solutions. The English language in India faces several problems, including limited access to quality English education, a language barrier, cultural appropriation, and lack of standardization. These problems are a result of factors such as the colonial legacy, education policy, socio-economic disparities, and globalization. To address these problems, solutions such as promoting Indian languages, standardizing English, increasing access to English education, and reevaluating education policy can be considered.

Keywords: *English language, India, problems, causes, solutions, education policy, linguistic divide.*

Introduction

India is a multilingual country, with over 1,600 languages spoken across its vast geography. However, English is considered as a significant language in India, especially in the urban areas. English has been a part of India's linguistic landscape since the 19th century, and it has played a crucial role in shaping India's history, culture, and society. But despite its importance, the English language in India faces several problems that hamper its effective use and development. This research article aims to examine the problems faced by the English language in India and proposes solutions to overcome them.

The English language has become an integral part of Indian society, particularly in the field of education and employment. It is the language of higher education, government, and business. English is considered a global language and has been a significant factor in India's growth as an economic superpower. However, the English language in India is not without its problems. This research article aims to explore the problems associated with the English language in India, the causes of these problems, and possible solutions.

India is known for its diverse linguistic landscape, with over 22 official languages recognized by the Indian constitution. Despite this rich linguistic diversity, English has emerged as one of the most important languages in India, particularly in the domains of education, business, and governance. The use of English in India dates back to the British colonial period, and it has remained an important language even after independence. The history of English in India dates back to the colonial era when the British introduced the language to India. It became the language of administration and education during the British rule. After independence, English continued to be used as the language of governance and higher education. However, the use of English in India has also been associated with social and economic disparities, where the ability to speak English is seen as a marker of social status and economic success.

However, the use of English in India has not been without its challenges, and it has created a linguistic divide between those who are fluent in English and those who are not. The purpose of this article is to examine the problems associated with the English language in India, particularly in the areas of education, employment, and social stratification.

The use of English in India has been a topic of scholarly debate for many years. Some scholars argue that English has been instrumental in bridging linguistic barriers and promoting national unity in India (Bose, 2018). However, others point out that the use of English has led to a linguistic divide between the elite and non-elite in India (Kachru, 1983). This divide has been particularly evident in the domains of education and employment.

One of the primary problems associated with the English language in India is its use in education. English-medium education is considered to be of higher quality and is often preferred by parents who can afford it (Kapur, 2018). This preference for English-medium education has created a situation where non-English-speaking students are at a disadvantage. Research has shown that non-English-speaking students have lower levels of academic achievement compared to their English-speaking peers (Mishra, 2019). This is particularly evident in subjects such as science and mathematics, where English is used as the language of instruction.

Another problem associated with the English language in India is its use in the job market. English has become a prerequisite for employment in many sectors, particularly in the service industry. This has led to a situation where those who are not fluent in English are often excluded from job opportunities, regardless of their qualifications or experience (Liu, 2020). This has contributed to the creation of a linguistic divide in the workplace, with English-speaking employees occupying higher positions and receiving higher salaries compared to their non-English-speaking counterparts.

The use of English in India has also led to social stratification, with English-speaking individuals occupying higher social status compared to non-English-speaking individuals (Kachru, 1983). This has led to the creation of an elite class of English-speaking individuals who enjoy certain privileges and advantages over non-English-speaking individuals. This has contributed to the perpetuation of social inequality in India, particularly in the realms of education, employment, and politics.

Problems

Despite its historical importance and current relevance, the English language in India faces several problems that hamper its effective use and development. The following are some of the significant problems faced by the English language in India:

Limited Access: Despite the widespread use of English in India, access to quality English education is limited to urban areas and higher education institutions. This limits opportunities for students in rural areas and those from lower socio-economic backgrounds.

Inadequate Teaching of English

One of the significant problems faced by the English language in India is the inadequate teaching of English in schools and colleges. English is taught as a second language in most schools and colleges in India, and the quality of English teaching is often poor. The teaching of English is primarily focused on grammar and syntax, and there is little emphasis on communication skills. As a result, many students who complete their education in India are not proficient in English, and they face difficulties in communicating effectively in English.

Lack of Exposure to English

Another problem faced by the English language in India is the lack of exposure to English. English is primarily spoken in urban areas, and most people in rural areas do not have access to English language resources. English language media, such as newspapers, magazines, and television channels, are primarily targeted at the urban elite, and the majority of the Indian population does not have access to them. As a result, many people in India do not have the opportunity to practice and develop their English language skills.

Influence of Regional Languages

India is a multilingual country, and the influence of regional languages on the English language in India is significant. Many people in India use English as a hybrid language, which is a mix of English and their regional language. This often results in incorrect usage of English, and it hampers the development of standard English in India.

Perception of English as a Foreign Language

Many people in India perceive English as a foreign language, and they do not view it as a language that is relevant to their daily lives. This perception often results in a lack of interest in learning and using English, and it hampers the development of English language proficiency in India. The use of English in India has also associated with the erosion

of Indian languages and culture. Many argue that the overemphasis on English has resulted in the neglect of Indian languages and literature, leading to a loss of cultural identity.

Lack of Standardization

Another problem faced by the English language in India is the lack of standardization. There is no uniform standard of English usage in India, and different regions and communities use English in their unique ways. This often results in confusion and misunderstanding when communicating with people from other regions. The lack of standardization also hampers the development of a uniform English language curriculum and assessment system.

Economic Divide

The economic divide in India is another significant problem faced by the English language. English is often seen as a language of the elite, and people from lower economic backgrounds often lack the resources and opportunities to learn and develop their English language skills. This economic divide often results in a lack of diversity in the use of English in India and hampers its effective use as a tool for communication and development.

Limited Access to International Opportunities

The English language is often considered as a gateway to international opportunities, such as higher education, employment, and business. However, many people in India do not have access to these opportunities due to their lack of English language proficiency. This limited access to international opportunities often hampers India's overall development and growth.

Causes of the Problems

Several factors contribute to the problems associated with the English language in India. These include:

- **Colonial Legacy:** The British introduced the English language to India during the colonial era, and it has remained a legacy of their rule. The association of English with colonialism has led to resentment and resistance in some sections of Indian society.
- **Education Policy:** India's education policy has been criticized for its overemphasis on English education, neglecting the promotion and development of Indian languages.
- **Socio-economic Disparities:** English proficiency is often associated with social status and economic success, creating disparities between those who have access to quality English education and those who do not.
- **Globalization:** The growth of the global economy and the need for a common language in business and professional settings have led to an increased demand for English proficiency in India.

Solutions

To overcome the problems faced by the English language in India, the following solutions can be implemented:

Improve English Language Teaching

To improve English language teaching in India, a more practical and communicative approach should be adopted. Teachers should be trained to focus on communication skills rather than grammar and syntax. The use of audio-visual aids and interactive teaching methods can also be employed to make English language learning more engaging and effective.

Increase Access to English Language Resources

To increase access to English language resources, English language media should be made more accessible to people in rural areas. The use of digital media and online learning platforms can also be employed to increase access to English language resources. Public libraries and community centers can be set up to provide access to English language resources for people from lower economic backgrounds.

Promote Standardization of English

To promote the standardization of English in India, a uniform English language curriculum and assessment system should be developed. The curriculum should focus on the development of communication skills and the use of standard English. The assessment system should be designed to measure the proficiency of students in standard English.

Change Perception of English as a Foreign Language

To change the perception of English as a foreign language, English should be presented as a language that is relevant to people's daily lives. The use of English language media targeted at different communities can be employed to make English more relatable to people from different regions and backgrounds.

Address Economic Divide

To address the economic divide in English language proficiency, the government and private sector can collaborate to provide scholarships and sponsorships for English language education for people from lower economic backgrounds. Public-private partnerships can also be employed to set up English language learning centers in underprivileged areas.

Increase access to quality education: One of the key solutions to the problems with English language in India is to increase access to quality education. This can be achieved by increasing funding for schools and colleges, improving the quality of teaching and pedagogical approaches, and ensuring that all Indians have access to quality English education.

- **Emphasize multilingualism:** Another solution is to emphasize the importance of multilingualism and the need to preserve India's linguistic diversity. This can be achieved by promoting the use of regional languages in education and the media, and by providing incentives for students to learn multiple languages.
- **Modernize pedagogical approaches:** To improve the effectiveness of English language teaching in India, it is important to modernize pedagogical approaches and incorporate more engaging and interactive teaching methods. This can include the use of technology, project-based learning, and other innovative approaches to instruction.
- **Address socio-economic factors:** Addressing the socio-economic factors that contribute to the marginalization of non-English speakers is also important. This can be achieved by increasing access to education and employment opportunities, providing language training and support, and promoting inclusive policies and practices.
- **Foster a post-colonial identity:** To overcome the legacy of colonialism and embrace the English language and culture, it is important to foster a post-colonial identity that values both India's cultural heritage and its global aspirations. This can be achieved by promoting a sense of national pride and identity that is inclusive and multicultural, and by encouraging Indians to embrace English as a means of achieving their goals and aspirations.
- **Access to English Education:** Efforts can be made to increase access to quality English education, particularly in rural areas and for those from lower socio-economic backgrounds.

Reevaluation of Education Policy: India's education policy can be reevaluated to ensure a balance between the promotion of English and the development of Indian languages.

Conclusion

The use of English in India has created several challenges, particularly in the areas of education, employment, and social stratification. English-medium education is considered to be of higher quality and is often preferred by parents who can afford it, leading to a disadvantage for non-English-speaking students. English has also become a prerequisite for employment in many sectors, leading to exclusion for non-English-speaking individuals. Additionally, the use of English has contributed to the perpetuation of social stratification, with English-speaking individuals occupying higher social status and enjoying certain privileges and advantages over non-English-speaking individuals.

Despite these challenges, English remains an important language in India, particularly in the realms of business, education, and governance. The Indian government has recognized the importance of English in these areas and has taken steps to promote English language learning, particularly in rural areas (Nair, 2020). The government has also launched several initiatives to improve the quality of English-medium education and increase access to English language learning opportunities.

The English language has played a significant role in India's linguistic history, and its use has been both beneficial and challenging. While English has facilitated communication and promoted national unity, its use has also created a linguistic divide and contributed to social inequality in India. Efforts must be made to address these challenges and ensure that English language learning opportunities are accessible to all individuals, regardless of their socio-economic background or linguistic proficiency.

The English language in India is an important factor in India's growth and development as a global economic power. However, the language also faces several problems, including limited access to quality English education, a language barrier, and cultural appropriation. These problems are a result of several factors, including the colonial legacy, education policy, socio-economic disparities, and globalization. To address these problems, solutions such as promoting Indian languages, standardizing English, increasing access to English education, and reevaluating education policy can be considered.

In short, Addressing the problems associated with the English language in India will require a concerted effort from the government, educational institutions, and society as a whole to ensure that English is used as a tool for growth and development rather than a marker of social status and economic success. The English language has played a significant role in India's history and continues to occupy a prominent position in the country. However, there are several problems associated with its use and teaching in India, including a lack of proficiency, elitism, cultural hegemony, the legacy of colonialism, and pedagogical challenges. These problems are caused by a variety of factors, including a lack of access to quality education, socio-economic factors, and a neglect of other Indian languages and cultures. Possible solutions include increasing access to quality education, emphasizing multilingualism, modernizing pedagogical approaches, addressing socio-economic factors, and fostering a post-colonial identity. By addressing these problems and implementing these solutions, India can ensure that English remains a vital and valuable part of its cultural and educational heritage.

References

1. Choudhary, P. (2020). English language education in India: A review of the current scenario. *Language in India*, 20(6), 174-183.
2. Giri, A. K. (2019). English language education in India: Historical developments, current status, and future challenges. *Current Issues in Language Planning*, 20(2), 153-170.
3. Pennycook, A. (2017). *English and the discourses of colonialism*. Routledge.
4. Thakur, S. (2019). The English language in India: Historical perspective and contemporary challenges. *Journal of Asian and African Studies*, 54(6), 785-799.
5. Bose, S. (2018). English language in India: A historical perspective. *International Journal of Humanities and Social Science Research*, 6(2), 25-34.
6. Kachru, B. (1983). *The Indianization of English: The English language in India*. Oxford University Press.
7. Kapur, A. (2018). The language of education in India: English or vernacular? *International Journal of Educational Development*, 60, 75-83.
8. Liu, W. (2020). The English language divide and social inequality in India. *International Journal of Intercultural Relations*, 75, 93-102.
9. Mishra, R. K. (2019). English language and academic performance: Evidence from India. *International Journal of Educational Development*, 65, 207-216.
10. Nair, S. (2020). English in India: Language policy and planning. *Current Issues in Language Planning*, 21(2), 113-126.

CHAPTER 2

NEED OF MULTIDISCIPLINARY RESEARCH IN CURRENT ERA

K. AMRUTHA¹

¹ Lecturer in English, Department of English
PVKN Govt. College(A), Chittoor

S. SUDHAKAR REDDY²

²Lecturer in Political Science, Dept. of Political Science
S.G.Govt. Degree College, Pileru

Abstract

Multidisciplinary research has become a boon in solving the current problems. Current problems requiring knowledge on all its aspects like economic, social, political, psychological etc. For an effective multidisciplinary research needs teamwork, leadership, tolerance of difference and ambiguity, and selflessness. Multidisciplinary means a team of specialized individuals of various fields, work together to get solution for the problem. Multidisciplinary approach can be applied to know all about any particular situation. This can be done by a multidisciplinary team. "The members of multidisciplinary research team should have different skills and backgrounds. The different viewpoints of team members shall complement each other and shall provide a more extensive picture and deeper insights.

Keywords: Multidisciplinary, Research, Skills

Introduction

Research means a search for knowledge. That means every person to extend their knowledge in new areas. Multidisciplinary research means a subset of research collaboration. It means different people worked on same issue to get the solution. It is a search for elucidation of a problem in a way of verifying the proposition combining many academic approaches, fields or methods. It is a search for knowledge through objective and systemic method for a primary part to the present stock of knowledge which has a combination of several disciplines and methods. Multidisciplinary research is a quest for truth in achieving a common goal with the help of different learning paths. They all pool their knowledge together for solving any problem.

All members of team should be involved in all aspects of study: design, data collection and analysis. Multidisciplinary research is a learning experience in which the participants also learn from each other. Multidisciplinary studies have acquired prominence in present time. Today it is difficult to keep a study of research separate from other disciplines like anthropology, sociology and psychology. Many Academic institutions nowadays are largely organized in ways that promote the advancement of individual disciplines, or sub-disciplines. Policies that govern hiring, promotion, and the allocation of resources often work against interdisciplinary or multidisciplinary research. In practice, multidisciplinary teams are composed of individuals coming from various disciplines. This means that they may not share the initial set of norms and values, and a time-consuming task of developing new norms for the team must take place. This task requires skills and flexibility both from leaders and team members. A solid foundation for building the new norms is a problem-solving orientation of the team and a clear shared goal. If multidisciplinary research is to flourish in academia, then the reward systems in academia have to recognize the different pace with which interdisciplinary research may proceed and the fact that it is often a team rather than individual accomplishment.

Multidisciplinary approach also encourages the study of phenomena in unified fashion. Thus it avoids the defect of isolated approach. It gives way to comparative study and at the same time helps in maintaining objectivity. It creates the feeling of understanding and sympathy among the experts of different fields.

Importance of Multidisciplinary Research

In this current era we have a lot of problems like socio – economic problems, having relation to other disciplines like politics, anthropology, psychology, need complete attack to get their solution. Economists for example may focus on

cost-effective mechanisms; Sociologists on empowering the poor and addressing social inequity; Anthropologists on acknowledging local customs, practices and social structures; Psychologists on attributions of responsibility, or individual relations at work and development practitioners, on relations with the local community. Without inclusion of these diverse perspectives, and the interaction of economic, sociological and anthropological/cultural variables etc, the risk of confirmation bias becomes, logically enough, elevated. This has resulted in adoption of multidisciplinary research which is in practice not only in developed countries but all over the globe. The approach of multidisciplinary research in this connection reveals its importance to find out the overall aspect. In theory, multidisciplinary research offers an opportunity for the international development research community to become more broadly consistent with the key principles in development policy as a whole. Linking development policies to multidisciplinary research practice also presents an opportunity to minimize the risk of “confirmation bias”.

Swot Analysis of Multidisciplinary Research

The SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) is a strategic planning measure developed from Marketing Science, and applied to assess the strategic potential of a development-related research. It has been widely applied to diagnose challenges and opportunities in development practice, including; for example, direct budget support. SWOT analysis has been found to result in superior decision-making compared to relatively unstructured methods “brainstorming”.

Strengths

The benefit of multidisciplinary research which was the most cited is that it provides different approaches and perspectives on problems. It provides fresh view point, cross-fertilization, exchanges of methodology. In turn it helps enhancing one’s disciplines thanks to the feedback generated. Multidisciplinary research enhances the vision of researchers on their own discipline. The second most cited benefit of multidisciplinary projects is that they are a way to acquire insights on other disciplines. Therefore multidisciplinary collaborations contribute to the lifelong learning of researchers. Moreover this knowledge is the most up-to-date and practical one. There is more shared knowledge by working together. Multidisciplinary projects facilitate exchanges between labs. Also, while reading papers from other disciplines you are limited by the content of what is published. While working in collaboration with researchers from other disciplines you can better understand what are their hypotheses and methodologies. It is much richer. Another strength of multidisciplinary research is that the motivation of researchers increases because their own expertise can be applied to other areas. It is linked to more reconnaissance of one’s work.

Opportunities

Multidisciplinary research helps setting and exploring new ideas or investigates neglected areas. Many interviewed people said that interacting with people from your own discipline can generally just bring incremental innovation whereas collaborating with people from other disciplines can potentially lead to the generation of new ideas and breakthrough technologies.

Multidisciplinary projects allow pulling expertise from different disciplines to solve specific issues. In the case of applied research most people said that the collaboration was necessary because only one partner did not have the sufficient expertise to do the entire work by himself.

Moreover, multidisciplinary research is seen as indispensable nowadays to tackle complex problems which cross boundaries of disciplines. Nevertheless some people acknowledged that there is still a debate between pros and cons of having, for instance, computer science inspired by biology. In any case, there is certainly a need for developing more sophisticated artifacts which is in favor of multidisciplinary research. Also the advantage of multidisciplinary research is that research can converge more rapidly. Researchers are more efficient if they are able to sum their expertise to solve problems. Indeed it would take longer time for just one laboratory to gain the required level of expertise in another field. Another opportunity of multidisciplinary project is that it can serve as a bridge between fundamental and applied research. Indeed fundamental researchers can confront their knowledge to real problems and applied researchers can benefit from the most advanced knowledge. Therefore multidisciplinary research offers the opportunity to open new areas of research, tackle complex problems and cover investment in research by opening the use of knowledge, tools, methodology and solutions generated in one discipline to other disciplines.

Weakness

The weaknesses of multidisciplinary research are mainly linked to problems of communication between people from different disciplines. These problems require more time to be settled down than conventional research projects would require. Also most participants said that they had to read more and invest more time in order to learn about the new disciplines. Therefore multidisciplinary research implies more investment of researchers in learning new disciplines. For these reasons, most people said that in multidisciplinary projects there is a high initial cost to pay to reach a good level of comprehension between the partners. The time to get rid of the major misunderstanding is sometimes considered as long as 1 to 2 years. This is why many people ask for different funding periods in the case of multidisciplinary research. Maybe there is also a maximum duration after which the efficiency of the cooperation decreases.

Also physical proximity of partners is primordial via frequent meetings or exchange of students. It is more important than in the case of mono disciplinary projects because people have to learn more about the other disciplines, not only in terms of knowledge but also in terms of methodologies, tools and constraints. In fundamental research it is considered as vital to reach a good level of interaction. Therefore costs of travelling are more important than in the case of mono disciplinary projects.

There is also more effort to provide as an individual. People have to be more patient. Sometimes, they have to explain things several times. They have to be trained to communicate efficiently the basic of their discipline and make themselves understand. They should also be able to adapt to the custom of other disciplines. Multidisciplinary research also implies a cost in educating people to the different disciplines involved. In multidisciplinary research projects it can be difficult to reach the step where everybody has the feeling that he is gaining something (win-win situation). Different competencies mean also different approaches to problems, which can generate conflicts. Therefore the management of such projects is crucial.

Threatens

Some people said that in the case of participation in multidisciplinary research, there is a potential risk to jeopardize one's status in one's disciplines. The researchers involved in multidisciplinary research risk to lose respect in their own discipline. So, multidisciplinary research projects can be seen as risky in terms of researcher's career. Some people even considered that multidisciplinary research could slow down the career of researchers. Also, multidisciplinary research can be judged as a non productive work due to the long hours spent trying to understand each other. The evaluation of multidisciplinary projects, either from evaluators or peer researchers, can lead to under-evaluation if not reviewed by people with multidisciplinary background. Time is a crucial element of a multidisciplinary research project. Therefore many people consider that there is a high risk to fund such a project for 3 years and then lose all the benefits of such collaboration if no continuation is allowed.

Some people consider that it is risky to provide funds to a group of people who do not know each other before the project because you do not know in advance if the collaboration would evolve smoothly. So they propose that while funding projects made of large consortia it is better to have peopled who know each other at the center of the consortium and new entrants at the periphery. Thus, it can be rightly concluded that despite having a number of merits, multidisciplinary research suffers from problems which can only be removed with care and caution. Indeed, 'there is a lot of encouragement for multi-disciplinary research, from policy makers and research funders, and it is generally seen as a 'good thing'. Yet the reality is that this is often very difficult to execute. For instance, the definition and the evaluation of the outputs (e.g. prototypes, patents or papers) vary across the disciplines, and the results of multi-disciplinary work might well be regarded as below the standard that each individual discipline seeks to impose on its own work. Consequently, those engaging in multidisciplinary work lose rather than gain credibility in their own 'home discipline'.

Conclusion

Educational Institutions, NGO's, various department and schools of University are emphasizing multidisciplinary research, nowadays, for complete and deep study of any problem. For this purpose, serious and special attention is

being paid towards discussion and deliberation regarding selection of problem topic. Today's world has become knowledge- driven and expertise-based. Efforts are on to make the life of man smooth running and comfortable. Consequently, it is endeavored to touch each and every aspect of human life. The nature of problem has become multi-dimensional and multi-pronged involving knowledge of numerous disciplines and subjects. These specialties and peculiarities have added to the significance of multidisciplinary research. Therefore, it can be said that today Multidisciplinary has been evolved to stay. For encouraging this approach in true sense of word, funds are essential in abundance. Since this approach of research involves experts of various fields for long duration for reaching at a conclusion, therefore, it demands abundant pecuniary support apart from patience, perseverance and dedication.

In absence of these basic requirements, the object behind multidisciplinary will not be attained and the entire work will be proved futile and in vain. Therefore, to eschew failure or rolling back in the midway, proper management and layout of the plan should be made in advance. Further utmost care should be taken to work out and implement that plan literally. Problems in today's world have become complicated and complex. This anomaly can be attributed to the giant leap man has taken in all the walks of life. The process of industrialization, urbanization is about to complete. These have given rise to problems and challenges of different character and nature. The human society at present has embraced the process of globalization, liberalization and open door policies. This approach has added quality and convenience to our life. But at the same time, they have brought many challenges which are quite complex and full of intricacies. The solution of such challenges cannot be reached at in absence of multidisciplinary research. Therefore, the recourse of multidisciplinary approach for research is must and essential.

Multidisciplinary Research can be fruitful and result- oriented only when, there is co-ordination, assistance and mutual agreement among various experts convened for the assignment at disposal. Because, the nature and attribute of issue prompted for multidisciplinary research for its solution stresses all these cardinal canons. They are sine qua non for success. A problem can have many vistas and dimensions. These different aspects can be studied and understood only with the help of multidisciplinary research. All the disciplines have their own peculiarities. Therefore in multidisciplinary research, it is very important that the thrust should be to co-ordinate and secure the chief characteristic of all disciplines.

Today, every society particularly educational institutions have understood the importance of multidisciplinary research. They fully believe that in order to deal more comprehensively the contemporary and future problems, multidisciplinary research is of immense importance. So in this connection, my submission is that a result oriented and problem-free- policy regarding multidisciplinary research should be drafted to give this beneficial approach a desired momentum. Thus, it can be said that for making multidisciplinary research successful, a meaningful equilibrium must be maintained between individual interest and demand of scientific co-operation. Finally, it may be concluded that it will allow us to achieve a happier future, avoid the mistakes of the past, and give us a social model of happiness that is enthusiastic, balanced and sustainable.

CHAPTER 3

FUNDAMENTAL RESEARCH IN SCIENCE TECHNOLOGY ENGINEERING ARTS HUMANITIES & MANAGEMENT

KASULA UMAMAHESWARA RAO¹

¹Lecturer in Computer Applications, Dept. of Computer Applications
Visvodaya Government Degree College, Venkatagiri, Tirupati

M. PADMAVATHI²

²Lecturer in Computer Applications, Dept. of Computer Applications
P.V.K.N. Govt. College (A), Chittoor

Abstract

BlockChain is a decentralized ledger of all transactions across peer-to-peer networks. It can be designated into different forms of network technology from public to private sectors. To elucidate BlockChain technology as a key factor to enhance the industrial supply chain management across the globe enabling cost-effective and fast-paced delivery of goods and services, products with privacy and high security as well as traceability. BlockChain Technology in Science, Technology, Engineering and Math (STEM) or STS (Science, Technology and Society) fields such as healthcare, data security management, finance, advanced manufacturing and urban development. Teaching is based on STEM in the same classroom, thinking and ideology. STEM integrates the arts knowledge to enhance their art or solve problems. Pure research is the source of most new scientific ideas and thinking. Career in STEM includes Animator, Agriculturist, Architect, Audio developer, Civil, Mechanical & Electronic Engineer, Media Artist, Orthopedic Technologist, Pilot, Website/App designer etc. I must seek effective ways to deliver the evolving possibilities of STEM fields to students during their earlier years of their education. School districts have been encouraged to consider STEM- focused schools to meet this demand and have responded by offering STEM magnet program options. STEM focuses explicitly on the hard scientific, technological, engineering and mathematical skills to create a new concept. As per the conversation, students leverage both hard and soft skills to solve problems.

Keywords: *STEM, BlockChain, STS or STEAM*

Introduction

Science, technology, engineering, and mathematics (STEM) used in the context of education policy or curriculum choices in schools. It has implications for workforce development, national security concerns and immigration policy, with regards to admitting foreign students and tech workers. The study of

- (a) emergence of blockchain technology and Web 3.0,
- (b) the blockchain platform operation in STEM disciplines,
- (c) the key academic players working along blockchain technology, and
- (d) the impacts of blockchain on humans and the environment.

Blockchain technologies have received considerable attention from academia and industry due to their distinctive characteristics, such as data integrity, security, decentralization, and reliability.

Challenges of adopting blockchain

1. The trade-off between power consumption, performance, and security
2. Data concurrency and throughput issue
3. Connectivity challenges of IoT
4. Handling big data on the blockchain
5. Challenges in maintaining both transparency and privacy
6. Regulating challenges of blockchain in IoT

Hence forward, IoT and Smart Learning Environments are the core elements that need to be adopted in STEM education, especially Smart Urbanization Education, where the development of a digital ecosystem and deployment of IoT technologies can be centered, equipping everyone with high-quality education and benefiting the social economy of the developing or rural countries.

Subject Categorical Analysis

Urban Development with IoT: Recently, IoT is expressively accelerating in the Information and Communication Technology (ICT) field. IoT frameworks implement the centralized server-client model, assimilating things with cloud servers via the internet and therefore offering users several services.

Hence forward, IoT and Smart Learning Environments are the core elements that need to be adopted in STEM education, especially Smart Urbanization Education, where the development of a digital ecosystem and deployment of IoT technologies can be centered, equipping everyone with high-quality education and benefiting the social economy of the developing or rural countries.

- **Finance:** Blockchain technology is also widely employed in several financial-related fields, namely, business services, financial assets settlement, economic transactions along with market prediction. Simultaneously, the applications based on blockchain technology could benefit enterprises through implementing them as business process management systems.
- **Healthcare Applications:** Blockchain technology along with the utilization of smart contracts could resolve issues of scientific reliability of finding things such as endpoint switching, data dredging, selective publication, and missing data in clinical trials.
- Healthcare practitioners do believe that the adoption of blockchain could upgrade the lifestyle of the patients, improve the healthcare quality and enhance the well-being of human mankind
- **Advanced Manufacturing:** Generally, the advanced manufacturing engineering education would not be limited to manufacturing itself but does cover a broad range of areas, including artificial intelligence, additive manufacturing digital systems, and control, creating a step closer to the Industrial 4.0 roadmap.
- **Data Storage and Security Management:** The applications and implementations based on blockchain technology are not merely improved data storage and security management but also helped by default suitability because all of the operations are verifiable. The futuristic features of this technology is highly required in many big ICT companies such as Meta, Amazon, and Google, providing a huge job opportunity.
- **Other STEM Applications:** The progress in nanotechnology together with both technologies, namely computational and communications, has built a way for unproblematic integration of electronics and also flexible sensors, which has proved to be quite valuable growth, exclusively in the health industry. The IoT coupled with nanotechnology has built a worthy prospect for plentiful applications to be industrialized in health monitoring systems, agriculture, and several other applications. The progress of nanomachines consents nano devices to create, compute, transmit, and gather data at the nanoscale. The communication of the linked devices at the nanoscale coupled with current classical communication networks at high speed has directed the development of the internet of nano things (IoNT). The IoNT benefits several sectors are found in agriculture, health monitoring systems, oil and gas, and multimedia coupled with several other applications.

Conclusions and Future Work

It is believed that this systematic review would be a valuable guide for scholars and practitioners seeking to understand the challenges and opportunities related to the adoption of Blockchain technologies across various sectors. Little attention has been paid to the role of technical, social, and psychological elements in understanding the adoption of Blockchain applications. To provide a thorough understanding of the implication of blockchain, future works are suggested as below:

- Integrated Economy, Environmental, and Energy (3Es) analyses should be carried out to evaluate the sustainable metric of blockchain adoption in various disciplines.
- Strength, Weakness, Opportunity, and Threat (SWOT) analysis should be carried out to evaluate the possible challenges and opportunities across the field.
- Policy-tree decision study should be carried out to provide a preliminary overview of blockchain, enabling the decision makers to analyze and plan the roadmap of Industrial 4.0.
- Integrating renewable energy with blockchain technology is a new breakthrough that should be looked into.
- Combining blockchain technology with engineering research will be highly beneficial in terms of optimization, cost-effectiveness, and time-saving, specifically in the field of nanotechnology and biology.

CHAPTER 4

BIG DATA ANALYTICS: THE HOPE OF MARKETING INTELLECT AND PLAN

S.K. SATHYA HARI PRASAD¹

¹Lecturer in Computer Applications, PVKN Govt. College (A), Chittoor

A. NIROSHA²

²Lecturer in Commerce, PVKN Govt. College (A), Chittoor

Abstract

Now days, Big Data Analytics has turn into a step by step more important tool for marketers in quest of to gain insights into customer behaviour and preferences. By analyzing large and complex data sets, marketers are able to make out patterns and trends, use this information to improve customer appointment, optimize marketing campaigns, and business growth. An overview of Big Data Analytics in marketing, exploring their benefits, challenges that arise when implementing it. Also highlights specific examples of how Big Data Analytics is being used in marketing, including social media analytics, predictive analytics, and machine learning. However, implementing Big Data Analytics in marketing is not without its challenges. Technical challenges, such as data quality and data governance, must be added to ensure that the data used for analysis is correct, consistent, and safe. Executive challenges, such as combining data from multiple sources and coordinating across different area of marketers, must also be addressed to ensure that insights that have a positive impact on the business.

Keywords: Bigdata Analytics, Social Media, Machine Learning, Optimizing.

Introduction

Big Data Analytics has emerged as a powerful tool for businesses looking for to gain insights into customer behaviour and preferences. This is particularly proper in the field of marketing, where the ability to analyze large and complex data sets has opened up new opportunities for marketers to understand their customers and develop more useful marketing strategies.

Big Data Analytics refers to the use of advanced analytical techniques to analyze large and complex data sets. In marketing, this includes data from a broad range of sources, including customer business deal history, social media activity, browsing behaviour, and more. By analyzing this data, marketers can identify patterns and trends that reveal insights into what motivates customers to buy, and how they prefer to engage with brands.

The prospective benefits of Big Data Analytics in marketing are major. By understanding of customer behaviour and preferences, marketers can develop more effective marketing campaigns that target the right customers with the right messages at the right time. They can also personalize the customer experience to enhance engagement and reliability.

Objectives

1. To understand the Customer Behaviour and the Preferences that must be used to develop the marketing level.
2. To Optimize the Marketing Campaigns and also conducting motivational insights that targets the customer.
3. To Enhance the Customer engagement and consistency to engage and work with right customers with right messages at right time.
4. To Improve the Customer maintenance to gain insights of preferences with predictions.
5. To Identify the Trending business opportunities to influence the customers with experiences and ad-sense.

Research Methodology

This is a conceptual study and based on the secondary data. The data has been collected from various e-journals, e-magazines, e-books, websites etc.

Challenges

- **Data Quality**
This is to ensure that the quality of the data. Data that is inaccurate, imperfect, or inconsistent can lead to incorrect insights and substandard decision-making.
- **Data Authority**
In accumulation to ensure data quality, challenges related to data authority, such as ensuring that data is properly managed and secured, and that privacy and authoritarian requirements are must met.
- **Technical Skill**
Big Data Analytics requires the technical knowledge and focused skills that may not be voluntarily available contained by the marketing organization. This can create the challenges in terms of hiring and retaining talent, and in collaborating effectively with other departments.
- **Combination various Data Sources**
Big Data Analytics frequently includes the combination of integrating data from various sources, which can be demanding due to differences in data formats, quality, and accessibility.
- **Cost**
Implementing the Big Data Analytics in marketing it leads to costly, requiring savings in hardware, software, and human resources. This can be a difficult for minor companies or those with limited resources.
- **Executive Grouping**
Big Data Analytics in marketing requires skill and association across multiple departments, including IT, marketing, and analytics. Ensuring that these teams are aligned and working effectively together can be a dispute.

Applications

- **Customer Distribution**
Big Data Analytics can be used to segment customers based on demographics, behaviours, and preferences. This allows marketers to fit their communications and offers to specific customer segments, improving the effectiveness of their marketing effort.
- **Predictive Analytics**
Big Data Analytics can be used for predictive modelling, which helps marketers to expect customer behaviour and predict future trends. This can help the companies to make more knowledgeable decisions about product development, pricing, and promotions.
- **Personalization**
Big Data Analytics can be used to create personalized marketing communications and offers that are more likely to boom with individual customers. By analyzing data on customer behaviour and preferences, marketers can create customized offers and recommendations that are custom-made to each customer's needs and their interests.
- **Social Media Analytics**
Big Data Analytics can be used to analyze social media data, such as mentions, shares, and comments, to gain insights into customer opinion and preferences. This can help companies to develop more effective social media strategies and improve customer engagement.
- **Pricing Optimization**
Big Data Analytics can be used to analyze pricing data to identify best pricing strategies. This can help companies to maximize the returns and effectiveness while remaining competitive in the market.
- **Campaign Optimization**
Big Data Analytics can be used to optimize marketing campaigns by identifying the best channels, messages, and offers for each customer segment. This can help companies to improve the campaign performance and to reduce the marketing costs.

Examples

- **Netflix**

Netflix uses Big Data Analytics to recommend personalized movie and TV shows recommendations to its customers based on their viewing history and preferences. This has helped Netflix increase the customer engagement and retention.

- **Amazon**

Amazon uses Big Data Analytics to recommend products to customers based on their browsing and purchase history. This has helped Amazon to increase the sales and customer satisfaction.

- **Coca-Cola**

Coca-Cola uses Big Data Analytics to analyze social media data and identify trends in customer response and preferences. This has helped Coca-Cola to improve its social media strategy and increase the customer engagement.

- **Starbucks**

Starbucks uses Big Data Analytics to analyze customer data and personalize its marketing messages and offers. Starbucks uses customer data to offer personalized promotions and rewards to its reliability program members, which has helped to increase the customer retention and loyalty.

Benefits

- **Improved Customer Insights**

Big Data Analytics allows marketers to gain deeper insights into customer behaviour, preferences, and needs. This can help companies develop more under attack and effective marketing strategies.

- **Better Decision-Making**

Big Data Analytics provides marketers with synchronized insights and data-driven recommendations, allowing them to make more informed decisions about product development, pricing, and promotions.

- **Increased Efficiency**

Big Data Analytics automate many marketing processes and tasks, allowing marketers to be more efficient and effective in their work. This can help companies to reduce the costs and increase success.

- **Competitive Advantage**

Companies that are able to effectively power Big Data Analytics in marketing can gain a competitive advantage in the market, by developing more effective marketing strategies, improving customer engagement and satisfaction, and increasing profitability.

- **Enhanced Customer Experience**

Big Data Analytics can be used to create personalized marketing messages and offers that are tailored to individual customers, improving their familiarity and satisfaction with the brand.

Conclusion

In conclusion, Big Data Analytics is becoming increasingly important in marketing, as companies look to gain deeper insights into customer behaviour and preferences, and to develop more targeted and effective marketing strategies. The use of Big Data Analytics in marketing can lead to improved customer insights, better decision-making, increased efficiency, competitive advantage, and better customer experience. Although the challenges and limitations associated with Big Data Analytics in marketing, it is clear that companies that are able to effectively influence these technologies and techniques can achieve significant business benefits. As such, Big Data Analytics is likely to continue to play a crucial role in determining the future of marketing.

References

1. Adnan, M., Iqbal, W., & Hussain, M. (2020). Big data analytics in marketing: A review and future research directions. *Journal of Big Data*, 7(1), 1-26.
2. Baesens, B., Bapna, R., Marsden, N., Vanthienen, J., & Zhao, J. L. (2016). Big data analytics in the financial services industry. *Journal of Business Research*, 69(8), 2952-2960.
3. Chen, J., & Zhang, C. (2014). Data-intensive applications, challenges, techniques and technologies: A survey on Big Data. *Information Sciences*, 275, 314-347.
4. Hajli, N. (2016). Social media strategic management with big data analytics. *Information and Management*, 53(7), 1049-1058.
5. Kwon, O., & Wen, Y. (2018). Big data analytics in hospitality and tourism: A literature review. *Journal of Hospitality and Tourism Technology*, 9(2), 204-220.
6. Lee, J., Kwon, O., & Sung, Y. (2018). The effects of big data analytics and social media on firm performance: Evidence from the fashion industry. *Sustainability*, 10(8), 1-22.
7. Li, Y., Huang, L., & Hu, N. (2019). Using big data analytics to improve customer experience management: An empirical study of the hotel industry. *Journal of Business Research*, 99, 479-486.
8. Lu, Y., Liang, X., Li, Y., & Zhang, X. (2018). Big data analytics for personalized and context-aware travel recommendation. *Journal of Travel Research*, 57(7), 842-857.

CHAPTER 5

ANALYSIS OF LAND USAGE AND LAND COVER CHANGES USING REMOTE SENSING DATA IN NELLORE DISTRICT

Dr. S. VINILA KUMARI¹ & M. ISMAIL²

Department of Computer Science
PVKN Govt. College(A), Chittoor

Abstract

The use of the remote sensed data is an important method to indicate land usage and land cover changes on the earth's surface. Remote sensing is one source to monitor land usage and land cover changes. Land usage and Land cover changes (LULC) were determined from the past 10 years in Nellore District by using Remote Sensing Technology. These changes mainly increase in barren/wastelands, agriculture, plantation and other lands. It shows effect on built up land, water spread area, and dense forest area which are vanished. To determine the fields of change due to urbanization activity through Remote Sensing Techniques is being done in this study.

Keywords: Remote Sensing, LULC, Classification, Urbanization

Introduction

The study of land usage and land cover (LU/LC) changes is very important to have proper planning and utilization of natural resources and their management. Traditional methods for gathering demographic data, censuses, and analysis of environmental samples are not adequate for multicompound environmental studies. The geospatial technology of Remote Sensing and GIS has a major role of natural resources. These techniques used highly for generating valuable information about various surface features of the earth. According to Remote Sensing Technology, the total area covered is approximately 13,076 square kilometres and these records for 4.75% of aggregate region of the State. The result shows that the Agriculture lands are well distributed throughout the study area and it covers 7015.92 sq. km (53.65 per cent). Forest occupies 2169.90 sq. km and sharing about 16.59 per cent of the total land use land cover of the study area. The built-up land occupies 443.83 sq. km (3.39 per cent) and there was a rapid expansion of built-up lands. Water bodies occupies 1441.70 sq. km (11.03 per cent). The Wet land occupies 601.83 sq. km (4.60 per cent).

Present study area shows development during the past decades in terms of urbanization, industrialization, and also population increase substantially. The main objective of this paper is to detect and quantify the LU/LC in an urban area, Nellore (Figure 1), from the past 10 years using satellite imagery and topographic map.

Study Area

The name of Nellore District has been changed as Sri Potti Sriramulu (SPSR) Nellore District on 4th June, 2008. Sri Potti Sriramulu Nellore District is one of the nine Coastal Districts of Andhra Pradesh. Sri Potti Sriramulu Nellore District is the southernmost coastal district in Andhra Pradesh stretching over 150 kms. length from North to South and 100 kms.

Breadth from East to west. The district is surrounded by Prakasam District on the north, Bay of Bengal on the east, Chittoor District and Chengalput District of Tamil Nadu on the south and Kadapa District on the west. The Veligandla ranges are on the western border of the district. The district lies between 13° 25' and 15° 55' N of the northern latitude and 79° 9' and 80° 14' of the eastern longitude. The district has an area of 13,076 Sq.kms. and accounts for 4.75 per cent of total area of the state.

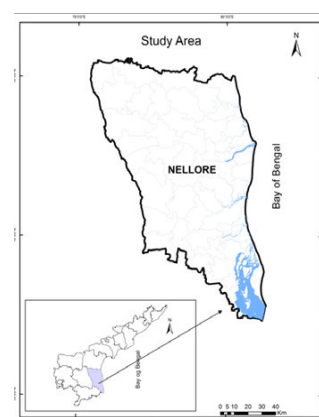


Figure 1: Study area.

Literature Review

1. Praveen Kumar Mullapattu and Jayaramireddy Sreeniasulur Reddy focus on LU/LC changes in an urban area, Tirupati, India, using remote sensing data and GIS technology. The results show that LU/LC changes were

significant during the period from 1976 to 2003. There is significant expansion of built-up area noticed. On the other hand there is decrease in agricultural area; water spread area, and forest areas.

2. M.Dharani and G.Sreenivasulu studied the Tirupati urban area, one of the development areas in these days; this area is famous for seshachalam forest. This forest area is decreased for the last fifteen years 2000 to 2017 due to drastically increasing of population. The digital image processing technique is helpful for avoiding the complexity of large data, etc. This technique is also useful in medical and hyperspectral satellite images also.
3. Narayana.S et.al focused on Parbhani City, Maharashtra is known for the famous Marathwada Agricultural University which is very helpful for the people residing all around. The classified image shows that the city is mostly occupied by crop land.
4. D.Lakshmi Prasad and G.Sreenivasulu used Satellite images in combination with predated topographic sheet of Survey of India and used for analyzing land usage and land cover change detection in Puliendula, Kadapa District, Andhra Pradesh.
5. S.Thangaperumalet.al attempted to identify such urban sprawls change from 2005 to 2015 on Sholinganallur, Chennai, India. This information assists in monitoring the dynamics of land usage resulting out of changing demands of increasing population.

Data Sources

The present framework of land usage/land cover classification system has been primarily developed for use with remote sensing data to meet the basic information need on land usage for agricultural planning. The land usage/land cover classification system is amenable for use with remote sensing data developed by the National Remote Sensing Centre (NRSC) and modified on the suggestions made by the planning commission of India has been adopted in the present study. The present classification system is carried out with the help of IRS-1C, LISS III geo-coded data integrated with Survey of India Topo Sheets on 1:50,000 scale using ERDAS-9.3 version software package for interpretation of various land usage/land cover classes. The detailed land usage statistics collected at the village level from the statistical abstract of SPS Nellore District for the year 2009&2013, 2015&2018 has been analysed and represented in the maps. The spatial database has been created in multilayers using Arc GIS 9.2 version package. The multilayered data for land usage/land cover features are interpreted and are classified using the classification levels as given in the following table 1.

Table 1 Land usage / Land cover classification levels

S.No	Level 1	Level 2	Level 3
1.	Built – up – lands	Settlements ,Transport	Urban / Rural Roads/ Railway lines
2.	Agricultural Lands	• Crop lands ,Fallow lands, plantations	
3.	Forest lands	• Ever green/semi-ever green forest • Deciduous forest • Degraded or scrub forest • Forest blank • Forest plantations • Mangroves	
4.	Waste lands	• Scrub lands • Barren lands • Mining and industrial wastes	• Land with scrub /land without scrub • Barren rocky/stony wastes • Mining / industrial wastes
5.	Water bodies	• Streams, Tanks	• Streams with water/dry stream • Tank with water/Dry tank

Results and Discussions

Study area LU/LC maps of three assessment years depicted in spatial distribution statistics of the five major LU/LC categories (Built-up, Agriculture, Forest, Barren lands, and waterbodies) and they % change and Net change are listed in Table 2 and Table 3 respectively for the period 2009&2013, 2015 &2018. The rates of change of LU/LC class during the period shown in Table 8. The detailed LU/LC classes are mentioned in Table 9

A. Spatial Distribution and LU/LC change

Land cover class maps and change assessment for the years 2009& 2013 and 2015&2018 shown in Figure 2 and Tables 2&3 respectively. The built-up area increases with an industrial development, expansion of Limestone, Barytes, Nellore slab mines, and urban/rural expansion.

The built-up area is 31.03km²for the assessment 2009, which sharply jumped to 52.40km²for the assessment year 2013. The Agricultural land comprises nearly 45% of total study area. Agricultural land for the assessment year 2009 is 300.85km²which is gradually decreased to 282.99km². The waste land is decreases from 41.91km²to 37.41km²during the time period 2009 to 2013. The wetlands show rising trend and waterbody falling down from 2009 to 2013 covering the land area of 404.46km².

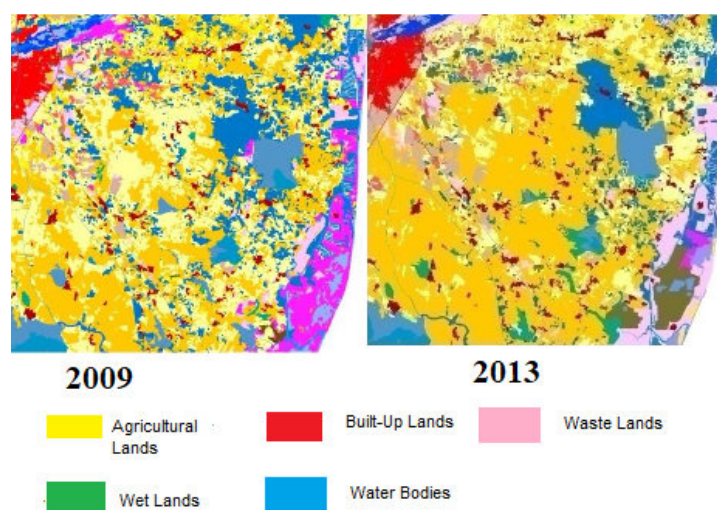


Table 2

S.No	Land Use / Land Cover	2009	2013	Change
		Area (km ²)	Area (km ²)	
1.	Built- Up Land	31.03	52.40	21.37
2.	Agriculture Land	300.85	282.99	-17.86
3.	Waste Lands	41.91	37.41	-4.50
4.	Wetlands	2.46	6.39	3.93
5.	Water body	28.21	25.27	-2.94
Total Geographical Area : 404.46 sq.km				

The major transformations observed in the year 2009 & 2013 is increased in Croplands are 12.78%, Industries 2.16%, Vegetated open areas 1.83% and decreased in Fallow lands 12.25%, Aqua culture 4.99%, Wasteland 0.69%.

The built-up area is 443.83 km² for the assessment 2015, which fall down to 371.66km² for the assessment year 2018. The Agricultural land comprises nearly 51% of total study area. Agricultural land for the assessment year 2009 is 6583.46km² which is gradually increased to 6699.48km². The waste land is increased from 1403.16km² to 1417.92km² during the time period 2015 to 2018. The wetlands show rising trend and waterbody falling down from 2015 to 2018 covering the land area of 13076.34km².

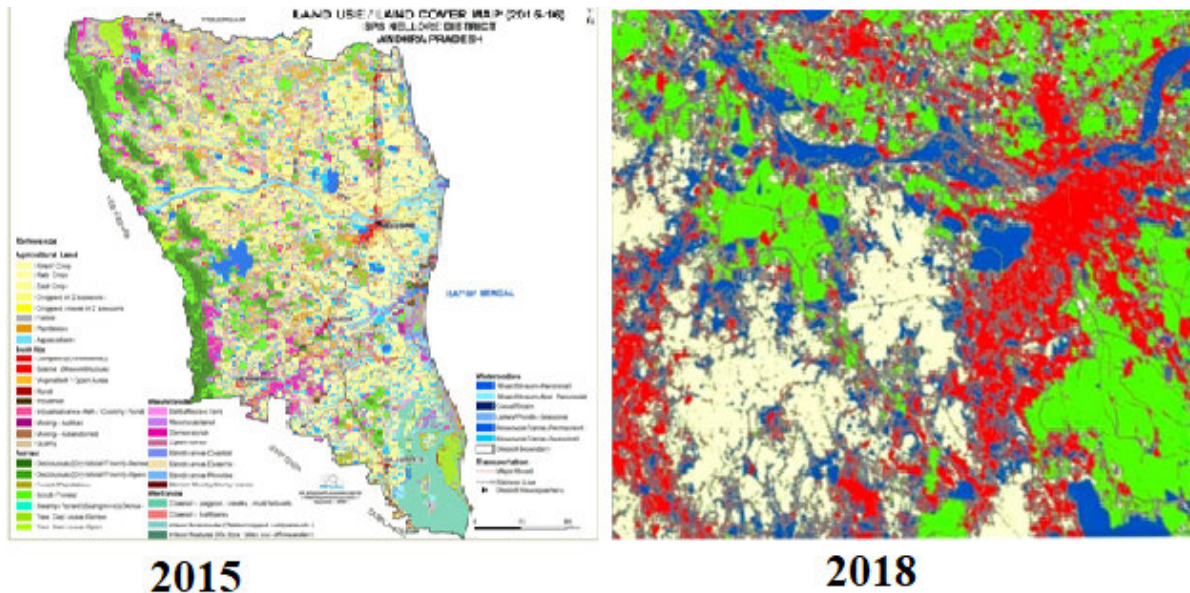


Table 3

S.No	Land Use / Land Cover	2015	2018	Change
		Area (km ²)	Area (km ²)	
1.	Built- Up Land	443.83	371.66	-72.17
2.	Agriculture Land	6583.46	6699.48	116.02
3.	Waste Lands	1403.16	1417.92	14.76
4.	Wetlands	601.83	892.24	290.41
5.	Waterbody	1441.70	590.12	-851.58
Total Geographical Area : 13,076.34 sq.km				

The major transformations observed in the year 2009 & 2013 and 2015&2018 are increased in Agricultural lands, waste lands. But major decreased is there in Built-up Lands.

Conclusion

In the present study, the classified LU/LC map is used to identify the changes in LU/LC during four different periods to understand the influence of LU/LC on changing environmental changes. Under the study area Agricultural lands, waste lands have been shown positive changes. But sustainable development is there in Built-up Lands. In the observation due to urbanization and increase of population the Built-up Land was decreased.

References

1. Praveen Kumar Mallupattu an Jayaramareddysreenivasulu Reddy, "Land use Land cover change using Remote Sensing Data and GIS at an Urban Area, Tirupati, India" *2013Article ID 268623*.
2. NagarajuArveti, BalajiEtikala, Padmanava Dash "Land Use/Land Cover Analysis Based on Various Comprehensive Geospatial Data Sets: A Case Study from Tirupati Area, South India" *Advances in Remote Sensing, 2016, 5, 73-82*.
3. T. Lakshmi Prasad and G. Sreenivasulu "Land Use/Land Cover Analysis using Remote Sensing and GIS: A Case Study on Pulivendula Taluk, Kadapa District, Andhra Pradesh, India" *International Journal of Scientific and Research Publications, Volume 4, Issue 6, June 2014 1 ISSN 2250-3153*

CHAPTER 6

EXPLORING THE INTERSECTION OF DIGITAL MEDIA, CREATIVE WRITING, AND READER ENGAGEMENT

NAMRATHA KOMATILANKA

Lecturer in English

Government Degree College for Women, Madanapalle

Abstract

This paper explores the relationship between digital media, creative writing, and the reader. With the advent of technology, digital media has become an important tool for communication, expression, and presentation. There is no exaggeration in saying that the lives and thoughts of people in the meta-modern era are more influenced by social media than their personal space and relations. It has transformed every sphere of human life irrespective of ethnicity, culture, and background. The paradigm shift of readers reading content online has paved a way for writers to choose online sources as a new tool for writing. From posting a status on Facebook to writing a story on Wattpad, from listening to audio-books on Audible to reading novels on Kindle, from understanding memes to cracking jokes on social media, the digital platforms have created a haughty impact on the lives and deals of the people. Digital media platforms have taken away all the established habits of people and replaced them with new apps and websites. It has greatly helped book lovers to share and buoyed literature from every corner of the globe. This century is the most advantageous one with the availability of incredible technology and resources thus making life easier and near. Overall, this paper suggests that digital media has transformed the relationship between writers, readers, and literary texts, offering new modes of creativity and engagement in the digital age.

Keywords: Digital media, creative writing, reading

Introduction

According to Datareportal, a total of 5.16 billion people around the world use the internet at the start of 2023, which is equivalent to 64.4 percent of the population. 4.74 billion people i.e., nearly 59.3% of the people are active social media users. 96.1% of the population owns some kind of digital gadget.

Prior to embarking on looking deep into the topic, it would be fair to give a brief lead-in on the importance of digital media in the 21st century. Digital media can be defined as products and services that come from the media, entertainment, and information industry, and its subsectors. It includes digital platforms (e.g., websites and applications), digitized content (e.g., text, audio, video, and images), and services (e.g., information, entertainment, and communication) that can be accessed and consumed through different digital devices. (World Economic forum.2016).

Digitalisation has positively impacted every being on the earth not just in the sphere of academics but also in the artistic arena. They let you learn, ameliorate and share skills without really relying on any other human. In the past two decades, the world has experienced a momentous transformation in the way people communicate with each other.

The way we create, produce, consume, and publish content is under the sway of digital sources. The social media platforms like Facebook, Twitter, Instagram, etc., though their main purpose is to entertain and connect people across boundaries, they instantly became the main stage for exhibiting one's talents. As the potential reach of these platforms is unimaginably huge, the writers got a chance to establish their own audience.

Creative writing in the world of Digitalisation

Writing has always adopted innovative tools throughout the generations. The urge to transform knowledge from one generation to the other made man use clay or stone to inscribe their messages. All those old constructions are really playing an important role in depicting the habitat and lifestyle of ancient people. Let it be clay, stone, feathers, wood, brushes, pens, ink, typewriter, computers, etc all acted as tools for writing. Today almost all forms of writing involve digitalisation, from typing text on Microsoft word to editing online, writers use different modes of software or gadgets.

Creative writing is a genre of writing that celebrates the writer's ability to use language in imaginative and innovative ways to create works of literature that are both engaging and thought-provoking. Creative writing should mainly evoke the emotions of the reader to get connected with the character and the plot. Throughout the ages, literature is the major source of inspiration and entertainment on the part of writers and readers. Considering the past

four centuries, one can experience the transformations that took place in the writings, their form, themes, and the audience. From handwritten documents to print copies to e-content, the platform for writing has taken different shapes. But the motive of creative writing almost reminds the same throughout this period.

The purpose of creative writing is to both entertain and share human experiences, like love or loss.
(www.medium.com).

Today the writing skills of young people are exhibited on different social media platforms starting from good morning messages to small passages on happenings of the day, experiences, travel quotes, likes and dislikes, food, hobbies, and many more. The feelings and emotions of the self are mirrored on social platforms like Facebook, Twitter, WhatsApp, etc. The picturesque image of a writer with piles of sheets and intensely hammering the typewriter is almost a romantic idea for this generation; all that a present-day writer needs is an electronic device to record his beautifully composed lines.

Beyond writing for pleasure many young people choose writing as their profession. Today's digital media has the ability to create professional writers as an ample number of publishing sites are available to promote and print their work. This has become an encouraging sport for present-day writers as the hardships of catching up with the publishing houses have gone down. Also, there are billions of pages and websites available on the internet for writers to write and expose their talent to the world. The facility of using words and phrases with colorful photographs, videos, editing software, and memes makes their passion more interesting and livelier.

The current generation of writers has a unique opportunity of knowing the readers, their tastes, trend, and interests. Every person choosing writing as a profession can adopt a writing style that suits his/her readers. Also, the availability of software like Microsoft word, PowerPoint, online Dictionaries, spell check, and grammar check apps facilitate lucid writing minimizing the commitment of errors.

The sites like Wattpad, Figment, Teen ink, Storybird, etc. are specially designed to encourage teen writers. Along with creating a platform to write, they also provide a good number of audiences to the writers. The only challenge of the present day is to write an interesting plot to clasp the readers and get the new ones. Only a satisfying story can bring a greater number of readers. The writer is responsible for deciding his writing style, genre, perspective, subject, and theme. The success of the writer is wholly dependent on how and from what point of view a story is told. Though the digital platform has made everything easy for a writer, no amount of technology will be able to hold the readers. Creative writing is not so simple without passion or interest, it requires a lot of research, imagination, and intellectual ability to express and explain the narrative and that is where the success of the writer depends upon. The writer should also be cautious that every reader of the modern day has access to judging and reviewing the content which may sometimes have a bad impact on the writer's confidence levels.

"No matter what kind of writer you are, it's important to get your work and your name out there."

(www.writersedit.com)

Blogs

Blogs are of great fashion in the modern-day as they give independence for a writer to express and formulate any of their opinions. Creative writing blogs hit one of the most widely visited sites all over the world. Personal blogs are according to the choice of the writer where he/she is allowed to share feelings, stories, content, views, etc., along with pictures, clipart, and graphs to make their writing more viewable and attractive. The success of the blog depends not only on the writing skills of the person but also on marketing skills. *"Authenticity, honesty, and personal voice underlie much of what's successful on the Web."* Says Rick Levine, Author of *The Cluetrain Manifesto*

Screenwriters, scriptwriters, and content generators

It is a known fact today that writers do not just write for print media, but also for different modes of media like television, film, games, YouTube, short films, etc. A lot of creative content is generated in every sphere of the globe not for books and publishing houses but for visual media. Though book readers have a special place in popularizing books, screenwriters, scriptwriters of television and other media cannot be ignored, as the modern-day audience are more in love with the visual form of entertainment.

Digital Journalism

Digital journalism sites are online platforms that provide news and information to audiences through digital media channels such as websites, social media, podcasts, and mobile applications. These platforms have revolutionized the way news is disseminated, consumed, and shared by audiences worldwide. Though Journalism is expected to provide factual data and information to the viewers, modern-day journalism is more inclined to produce data and facts in a creative manner adding emotion and drama to the news. Digital journalism provides a platform for journalists to experiment with different forms of storytelling, including interactive graphics, podcasts, videos, and social media content. These tools allow journalists to tell stories in more engaging and immersive ways, enhancing the audience's experience and providing a more in-depth understanding of the news.

Reading at Ease

Not just the way of writing, digital media has also transmuted the way people read books. In the good olden days, carrying a handwritten manuscript is a luxury, but with Gutenberg's greatest invention of the Printing press, things have a turn. It has revolutionized and changed the habits of writers and readers, the book became handy and affordable. Present-day readers are experiencing one more revolution with the change in their reading habits, choosing different formats of books, such as e-books and e-content. E-books today have broken down all the boundaries of a reader and connected them to other readers around the Globe. Along with reading books, social media has made it easier to discuss books and Literature. The number of e-book readers has more than tripled since 2011. Even though the readers are familiar with e-books, the printed version is not stumbled, instead, the two formats go hand in hand.

The availability of the internet, storyboards, smart devices, and e-readers is truly a technological blessing. The efforts of readers searching for a book through library shelves or books stores have rapidly gone down. The old method of searching physical libraries for a book or information consumed a lot of energy and time which is now made easy with the availability of e-books and e-content. Now readers with one thought and desire can access any number of books online.

Though technology's impact is seen in every sphere of life, technology did not drive us away from anything. It just altered the way we use things. The availability of sites like Scribd, Researchgate, and Academia not only allows the reader to choose their favorite books; they also give access to secondary text. Kindle, iBooks, Google play books, and Goodreads are some apps at hand to read books on smart devices. These apps come with additional features like highlighting the text, tracking the reading time, bookmarks, and eye-friendly brightness, which create a comforting environment for the reader.

Book reading apps

Book reading apps have become increasingly popular in recent years, as more and more people turn to digital devices for their reading needs. These apps are convenient, cost-efficient, user-friendly, and customizable. Amazon has created a monopoly market by selling a book-reading digital gadget 'Kindle' catching the interest of book lovers. Millions of readers choose kindle over buying a pile of books as this is more convenient for the reader to read the text from anywhere. The apps like google play books, scribed, Kabo, Goodreads, nook, etc., provide a user-friendly experience to the reader and make reading more interesting, economical, and efficient. These apps also offer a varied number of features like customizable reading settings, including font size, background color, and brightness, which can make reading more comfortable for users. They also offer syncing capabilities, so you can seamlessly switch between devices and pick up right from where you left.

Audiobooks and podcasts

Stories are not just for reading but also for listening. The past centuries have passed its culture, traditions, and rituals to the next generations through storytelling. Inspired by old storytelling activities, present-day technology offers various storytelling apps, audiobooks, and podcasts. Audiobooks and podcasts have become increasingly popular in recent years as more people look for new ways to engage with content on the go. One of the significant advantages of audiobooks and podcasts is that they offer a hands-free way to engage with content, which can be particularly helpful for people who are visually impaired or have difficulty reading printed materials. They are also a great way to stay entertained and informed while doing other activities that require your hands or eyes, such as driving or cooking.

Digital Education

Digital education refers to the use of digital technologies to deliver educational content and facilitate learning. It has become increasingly popular in modern times due to the widespread availability of digital technologies and the need to adapt to the changing landscape of education. Many universities and educational institutions now offer online courses that allow learners to complete their education from anywhere in the world with just an internet connection. These courses range from short-term certification programs to full-fledged degree courses. The availability of facilities like videos, quizzes, and discussion forums promotes engagement and active learning. Also, digital learning can be more cost-effective than traditional forms of education, particularly for students who do not need to pay for housing, transportation, or other expenses associated with attending a physical institution.

Limitations of reading text online

The challenge with digital reading sites is that we use smart devices for quick actions: like searching for the meaning, playing a game, reading a quote, transactions online, etc., but not for reading bundles of pages. When a reader chooses to read a novel or text online, to what extent he/she pays attention is a questionable situation. The readers generally pick tiny text, novella, or an essay to read on their gadgets and show their desire to read a bulky book in a printable version.

Conclusion

The importance of digitalisation in this modern world is a blessing for both writers and readers. With the advent of the internet, social media, and mobile devices, we now have access to an unprecedented amount of information at our fingertips. Reading and writing have become more interactive, collaborative, and diverse. More social media sites and applications imply a writer and reader to be cautious to choose the best platform. Especially for creative writers, there are many opportunities to explore and use multiple platforms for exposing their writing talent. The writer with genuine capabilities and resistance has every door open to get success in this world of digital media.

Social media has directly connected the writer and the reader, allowing the former to know the tastes and likes of his audience. Digital platforms, when cautiously used, can facilitate many career opportunities and a deserving amount of success for the writer. There is no wonder in saying digital media gives us immediacy, direction, and value of an individual.

Overall, digital media has had a significant impact on the way we read and write. It has provided us with access to a wealth of information and has made it easier to collaborate and share our writing. However, it has also raised concerns about the reliability of information and the impact it has on our ability to focus and retain information.

References

1. Baron, Naomi S., et al. "Reading in a Digital Age." *Kappanonline.org*, 5 Dec. 2018, kappanonline.org/reading-digital-age/.
2. David Amerland, "*The Social Media Mind*", p.59, New Line Publishing, 2012.
3. Dr. Sanchita, Jacob EapenKunnat, "*Deciphering Digital Imprints of Identity*", *RJELAL*.Issue 2. Volume.8. April-June 2020.
4. Gill, Terveen. "*The Higher Purpose of Creative Writing*." *Medium*, Medium, 30 June 2018, medium.com/@terveen.gill/the-higher-purpose-of-creative-writing-a2fb81368427.
5. Kawasaki. Guy and Peg Fitzpatrik, "*The Art of Social Media*", Portfolio, 2014.
6. Saritha Nayyar, "*Digital Media and Society Implication in Hyper Connected Era*", World Economic Forum, 2016.
7. Tuffield, Rhiannon, et al. "Surviving as a Writer in the Digital Age • Writer's Edit." *Writer's Edit*, 24 Apr. 2017, writersedit.com/fiction-writing/survive-writer-digital-age/.

CHAPTER 7

IMPACT OF MUNICIPAL SOLID WASTE MANAGEMENT IN INDIA

N. UMA DEVI & CHANDRA

Lecturers in Political Science, PVKN Govt. College (A), Chittoor

Abstract

Waste Management is an integral part of the force chains that our global frugality relies on. Solid Waste Management view the collection, transporting, treatment and disposal of solid waste inclusively with observation and regulation. Solid Waste Management is one of the primary essential workshops handed by external authorities. With the exponential function development of people, there has been a remarkable growth in everyday waste wherein comely running with disposal reason serious Sociology-profitable worsening. In India vast environmental problems are rising in solid waste operation due to urbanization. Solid Waste is one of the biggest problems in metropolises. Solid Waste is managed by three introductory rules REDUCE, Reclaim and Exercise. Indecorous solid waste operation causes a dangerous tenant. Solid Waste is used as waste energy. The Study of Solid Waste Management is varied in the present system of solid waste disposal and advanced use as energy. Solid Waste is treated and disposed of by several styles Incineration, Composition, tip, Application and Windrow composition.

Keywords: SMW, REDUCE, REUSE, ULBs & SPCBs

Introduction

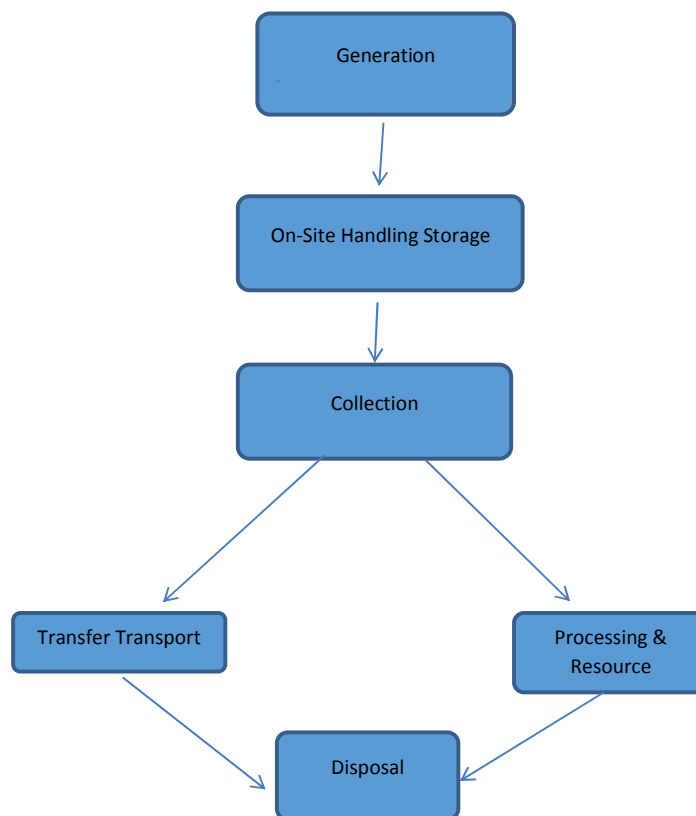
The operation of Municipal Solid Waste is one of the major functions of all Civic Original Bodies (ULBs) in the nation. External Waste Management is habitually a community- position action that includes the collection, division, exercise, storehouse, transport, recycling, and end- of- life process similar as disposal in tips, function, and power generation using the sweet content of the wastes. External Solid Waste includes specialized and domestic wastes generated in external or notified areas in either solid or semi-solid form except artificial. One common Yarn among these delineations is the conception that waste is a material that's unwanted by its manufacturer. The unwanted accoutrements may be by- products of a product process- cover ash from an assembly External Solid Wastes Rules, 2000 are applicable to every external authority responsible for the collection, separation, storehouse, charge, processing and disposal of external solid. Liabilities of the Maker have been introduced to insulate waste into three aqueducts, Wet, Dry and domestic dangerous wastes. Solid Waste Management (SWM) has appeared as one of the most important development challenges in civic India. Numerous studies point out that the insecure disposal of waste generates insecure feasts and action, due to organism corruption responses, climate conditions, refuse characteristics and land- filling operations. India is formerly washed- out all accessible tip spots, and the concerned ULBs don't have the coffers to acquire new land. While numerous Indian ULBs do admit governmental backing, nearly all of them continue to be financial fragile. Also, chancing new tableland spots is a delicate task as original officers are antipathetic to setting aside land in their legal power for waste that comes from another sphere.

Objects of Solid Waste Management

The overall objects of the solid waste operation assessment are epitomized below

- To assess the conditioning involved for the proposed and determine the type, nature and estimated volumes of waste to be generated
- To identify and implicit environmental impact of the generation of waste at the point
- To recommend applicable waste running and disposal measures routing in agreement with the current legislative and executive conditions and
- To categories waste material where practicable for disposal considerations i.e. public stuffing areas tip.

Elements of Solid Waste



Six Functional Elements of Solid Waste

- Generation of the Solid Waste
- On- Site Handling & Storage
- Collection
- Transfer & Transport
- Material and resource recovery
- Disposal

Types of Waste

Domestic Wastes include food waste, paper, Glass, essence, plastics, fabrics, etc. A large part of Domestic wastes belong of factory and beast waste similar as vegetables, fruit peel, bone and meat waste, and funk and fish waste, which are reasoned as wet wastes. Specialized waste means solid waste generated by stores, officers, caffs, storage and non manufacturing conditioning at artificial facilities. Management of Industrial Solid Waste (ISW) isn't the responsibility of original bodies. Industries generating solid waste have to manage similar waste by themselves and are needed to seek authorization from separate State Pollution Control Boards (SPCBs) under applicable rules. Still, though common sweats of SPCBs, original bodies and the diligence, a medium could be develop for better operation.

E-Waste are the unwanted electrical and electronic products like computer beach their central, home appliances, audio or videotape devices. These products comprise poisonous essence like lead, cadmium, beryllium, chromium, just to name a many, E-Wastes generally come dangerous when they're recycled or inclined of by primitive styles similar as simply jilting it to the scrap lockers. Once uncovered to the terrain, these poisonous chemicals can origin severe health problems. Improper disposal of these used batteries results in the release of some poisonous chemical which contaminates both the soil and the water bodies. They can come dangerous to the terrain, especially affecting the health of all the living organisms in the world Every time roughly, 2.7 billion dry- cell batteries are used in India. Waste Management's future includes turning waste in to energy, Io T- enabled practices, enhancement in covering systems, data collection, and much further technology- grounded advancements.

Problems

- Yet several problems are endured in solid waste operation that includes:
- Inadequate service coverage
- Lack of authority to make fiscal and executive decision
- Lack of financial resources
- Lack of vehicles and outfit/ being formerly constantly breaks down
- Rapid urbanization excelling service capacity
- Unbridled proliferation of squatter agreements delicate to detect and acquire tip point
- Poor public cooperation
- Lack of good private contractors
- Control of contractual service being delicate

Suggestions

- Recycling not only saves energy but also prevents the accoutrements from going to tips & incineration
- Provides Raw Accoutrements for new products
- Installing further lockers for collecting recyclables like paper, glass, plastics, etc., and also recovering them can be a huge step
- insulate organic and biodegradable waste similar as food waste and theater waste in green
- The organic waste can be used for composting, you can use heroic for glass and paper, blue for plastic and non-biodegradable waste
- You can contribute to better solid waste operation by investing in applicable products

Conclusion

Waste can be put in to tips, hurting down, reclaimed, or composted. Solid Waste Management can be characterized the collection, junking, process, and disposal of accoutrements thoughtful waste The most property way to manage waste is to reclaim and compost. Most nation punitively have major goods on the terrain due to Solid Waste generation with profitable development since the natural coffers are used, and waste and pollution are produced. Thus, the concern towards the operation of solid waste as an integral part for sustainable development has increased. Incorporating this methodology into your business waste reduction and recycling sweats will minimize tip waste and help take recycling program to the coming position.

References

1. https://www.epd.gov.hk/eia/register/report/eiareport/eia_01199/v1a-8.pdf
2. <https://www.researchpublish.com/upload/book/PROBLEMS%20OF%20SOLID-5835.pdf>
3. https://www.google.com/search?q=what+are+the+suggestions+for+solid+waste+management+pdf+download&biw=1366&bih=580&sxsrf=APwXEdcL1S9DjRJLGFimiaY1-sM-8JpXgw%3A1680077755158&ei=u_MjZKWpCfeH4-EPx7SV0A8&oq=what+are+the+suggestions+for+solid+waste+management+
4. https://www.ijsr.net/get_abstract.php?paper_id=ART20171944
5. <https://www.google.com/search?q=abstract+on+municipal+solid+waste+management&sxsrf=APwXEdcek5GbpCulRbM->
6. <https://leadpointusa.com/10-biggest-problems-facing-wasterecycling-industry-solve/>
7. https://www.academia.edu/41946128/Solid_Waste_Management_Challenges_and_Solutions_in_Developing_Countries_Case_study_of_India

CHAPTER 8

FROM TRAUMA TO TRIUMPH: A STUDY OF MAYA ANGELOU'S AUTO BIOGRAPHIES

SHAIK MOHAMMAD SHAFIULLAH

Assistant Professor of English
PVKN Govt. College (A), Chittoor

Abstract

The present paper delineates on the autobiographical and traumatic incidents that were connected with the life of Maya Angelou in particular and with the life of Afro-Americans in general in her first autobiography 'I Know Why the Caged Bird Sings' (1969). Like a historian, she documents and serialized all the important traumatic incidents and influences that she had in her life. She narrates and pens her life in a series of seven autobiographies in a serial and sequential manner and each autobiography draws the readers' attention to the inhuman racial segregation and exploitation. Her first autobiography 'I Know Why the Caged Bird Sings' (1969), sketches out all the incidents, places and people by unveiling the desperate traumatic encounters of her life in 36 chapters. Each of these 36 chapters delineates and discusses the themes of race, gender, sex, rape, segregation etc. from the age of 3 to the age of 16 in an open and detached manner. 'I Know Why the Caged Bird Sings' (1969) traces out the transformation of a black, timid, shy and voiceless child into an independent and self-reliant black female voice. Her autobiographies do not just recount the incidents that had taken place in her life chronologically, but envision the whole African-American community as a 'caged bird' that yearns for emancipation from racial subjugation and subordination. Her life and works remain an inspiration not only to African Americans but also to individuals trapped in the labyrinth of wretchedness.

Keywords: Trauma, Autobiography, Racism, Gender, Emotional Intelligence, BlackAesthetics.

Introduction

Maya Angelou's seven Autobiographies are a real testament of her talent and resilience and as an extra-ordinary writer. She loves the world as none has done so, inspite of its cruelty. Speaking about this extra-ordinary woman, Barak Obama wrote:

"A brilliant writer, a fierce friend and a truly phenomenal woman." (1969:1)

The poems and the stories that she wrote, bear a testimony to her rugged life and the evolution of an Afro-American writer, whose pen demonstrates her dignity and strength with which she has narrated her inspired life in the form of seven autobiographies. Remembering Maya Angelou and her poems and stories, President Bill Clinton opines: "The poems and stories she wrote.... Were gifts of wisdom and wit, courage and grace." (1969: i)

All the seven autobiographies were the bold expressions of her courage and determination to honestly delineate her struggle, her character, her aspirations, and the image of her Black African – American woman in all its adversities. Through these autobiographies, she had proved her strength and openly discusses her life – both private and public with an uninhibited confidence. The courage with which she faced the world is something extra-ordinary, exceptional and praise worthy. By the time, Maya Angelou published her first autobiography, *I Know Why the Caged Bird Sings* in 1969, she was already forty-one-year-old and she had crossed all the traumatic experiences of her personal life. Her first autobiography, *I Know Why the Caged Bird Sings*, talks about her life from the age of 3 to the age of 17. These initial traumatic years had a profound influence on the young mind of Maya Angelou.

The greatness of Maya Angelou and her autobiographies lies in the fact that; she was able to discuss her private life along with her personal details. As Hilton points out:

Black female writers were marginalized to the point that they were unable to present themselves as central characters in the literature they wrote. (Hilton Als:2002)

In her first autobiography, *I Know Why the Caged Bird Sings*, she narrated how the strength of character and an interest in literature can help her psychologically to fight against all odds of racism and trauma. In this first autobiography, her life begins at the age of 3, when she and her brother, Bailey Jr., were sent to stamps, Arkansas to live with her grandmother, Mrs. Annie Henderson. Quoting the traumatic situation at an early age, Maya Angelou wrote:

When I was three and Bailey four, we had arrived in the musty little town, wearing tags on our wrists which instructed – ‘To whom it may Concern’ – that we were Marguerite and Bailey Johnson Jr., from Long Beach, California, en route to stamps, Arkansas, C/o Mrs. Annie Henderson. (Maya Angelou, P.7)

There is no one quite like Maya Angelou. Poet to the President, champion of the people, best-selling autobiographer, her experiences as dancer, singer, waitress, activist, director, teacher, wife, mother and above all a great humanitarian have made her one of the few people, truly qualified to share her lessons of a life time. Born on 4 April, 1928, she chronicled an extra-ordinary life; rising from poverty, violence and racism. Her childhood name was Marguerite Annie Johnson. She and brother Bailey Johnson Jr. came to Arkansas at the age of 3 to live with her grandmother, Annie Henderson. Her growing up at Arkansas with her brother chronicles her formative traumatic life and the way she faced the world with unshakeable calm, confidence and a fierce grace. Speaking about this phenomenal woman, *Oprah Winfrey* states:

“She moved through the world with unshakeable calm, confidence and a fierce grace..... She will always be the rainbow in my clouds.” (Ibid: 1969 p.1)

The first series of her autobiography, *I Know Why the Caged Bird Sings* starts when Maya Angelou was three years old and ends when Maya Angelou becomes mother at the age of 16. The traumatic life story of Maya Angelou from the age of 3 to 16 is graphically portrayed through the pen of Maya Angelou. These formative years, forms the stormy and traumatic years, which had considerable impact on the mind of the author. During this period of her life, she has shown how difficult it is for an Afro-American society to live and continue one’s life in the racist and segregated society of Stamps, Arkansas along with her grandmother. She penned her powerful thoughts through her example and portrays the life and traumatic situations that were prevailing in her childhood for the black people. Pointing out the differences that exists between the blacks and whites, she wrote:

In Stamps the segregation was so complex that most of the Black children didn’t really and absolutely know what whites looked like. Other than that they were different, to be dreaded, and in that dread was included the hostility of the powerless against the rich, the worker against the worked for and the ragged against the well-dressed. (Ibid: p.27)

Her first autobiography, *I Know Why the Caged Bird Sings*, was published in 1969 and it achieves instant success and bring fame and name to its author, Maya Angelou. In this work she penned with detailed description of every situation that relates to her life. In this autobiography, she talks about how she and her brother, Bailey Jr., were left alone under the care of her grandmother, due to the divorce of her parents at the tender age of three. Later, she also talked about the schools that were meant for the blacks, and the life of segregation in Stamps, Arkansas. The second autobiography she wrote is *Gather Together in My Name* (1974). It chronicles her life from the age of 17 to 19 years. Her third autobiography, *Singin’ and Swingin’ and Gettin’ Merry Like Christmas* (1976), chronicles her life from the age of 20 to 27 years. Her fourth autobiography, *The Heart of a Woman* (1981), chronicles her life from the age of 28 to 33 years. Her fifth autobiography, *All God’s Children Need Traveling Shoes* (1986), depicts and chronicles her life from the age of 33 to 36 years. Her sixth autobiography, *A Song Flung Up to Heaven* (2002), narrates her traumatic life from the age of 36 to 40 years. Her seventh and last autobiography, *Mom & Me & Mom* (2013), narrates her relationship with her mother Vivian Baxter, and her behaviour during the abandonment of her and her elder brother, Bailey Jr., when they were kids, and left under the care and guidance of her grandmother. Thus, all the seven autobiographies depict the traumatic and emotionally disturbing situations that she faced and how she tackles all the problems with lion’s heart and comes out victorious. Any other lesser conviction woman would have succumbed to the failures and given up the fight against all odds. But, Maya Angelou turned every trouble into an opportunity and achieves success as a first Afro-American writer, to write a series of seven autobiographies of her life.

Her parents divorced, when she was still a kid. Angelou lived most of her childhood with her grandmother, whom she called ‘Momma.’ Angelou’s mother Vivian Baxter was an inadvertent player who caused trauma in Angelou’s life. When Angelou was 8, her mother’s boyfriend raped Angelou. This traumatic experience had left Angelou shattered and refused to speak for several years. During these traumatic years, she only had a conversation with her brother, Bailey Jr., whom she says, her ‘monument in the world.’ Maya Angelou’s seven volume of autobiographies are a testament to the talent and resilience of this extra-ordinary writer and James Baldwin is right when he says:

“I know that, not since the days of my childhood, when people in books were more real than the people one saw every day, have I found myself so moved.” (1969).

Influence of Trauma on Child’s Psyche and Persona

The impressions that a child records ever since his / her infancy with the reinforced messages she/he perceives from the environment in which the child grows up, and the messages being stored in the deeper recesses of the psyche, have significant influence on the child’s psyche and persona. Gardner, Professor of Cognition and Education at the Harvard Graduate School of Education and an adjunct Professor of Psychology at Harvard University points out in his book *‘Learning Minds’* (2011) that by the age of five, most children have formed a basic paradigm based on their early experiences that shapes their view of what life is about, how it works, and how to cope with it. He calls this “Unschooling mind” (5). In her essay, *‘Wouldn’t Take Nothing,’* Angelou reinforces this perspective when she states, “It is said that persons have few teachable moments in their lives” (87) and Maya Angelou recounts such moments with her grandmother between the ages of three and thirteen. Imparting key lessons in moral, ethical and spiritual values in children right from the beginning will shape them as good citizens in society. According to *Helen Taylor* (2001), teaching children the key lessons is fundamental in shaping a just and righteous society. In Maya Angelou’s life the influence of her grandmother is very high.

The mind of a child can be strongly moulded by his or her growth and development through books, institution and environment, which contribute in unfolding one’s latent potential to result in the resurgence of one’s self, besides enabling one to attain a greater domain of creative expression and resourcefulness by withstanding oneself to unfavourable and harrowing experiences one may encounter. *Harold Blood* (2009), a well-known critic of Maya Angelou notes in his introduction to *Critical Interpretations of Caged Bird* as:

“...trauma ensues and yet the extra-ordinary strong soul of Marguerite Johnson eventually goes beyond the trauma... Hundreds of thousands of readers have found in ‘Caged Bird’ an implicit image of the resurrection of their own innermost self, a fragment of divinity that transcended natural birth and so never die.”(P. no.2)

Maya Angelou uses her autobiographies to explore the themes of racism, class, gender, family relations, divorce, rape, literacy etc. Through her autobiographies Maya Angelou demonstrates and chronicles her life from the age of 3 to 40 years. And the seven autobiographies correspond to these years of her life. Every poet is moulded by his or her age and by the great events that take place during his/her impressionable years. It is true in the case of Maya Angelou too. In the thirties, it was the Great Depression and the Spanish Civil War that sparked the emergence of Black Aesthetic concerns in her, which is clearly seen in her earlier poems. These events ripened her views on Black aesthetics and it is revealed through the poems of her middle period. Her mature thoughts reach its pinnacle in her later poems wherein she becomes the epitome of Black Aesthetics. The traumatic experiences that Maya Angelou encountered might have negatively affected a person of lesser conviction, but not Maya Angelou. The kind of practical spiritual wisdom that she got from her grandmother strengthened her to encounter any traumatic situation right from her childhood.

People who encounter traumatic events in life, undergo emotional disruptions and pain and this in turn make them emotionally dysfunctional. The surplus of counterproductive emotions would affect one’s mental disposition adversely and ultimately turning him or her into a negative personality. As the true self is clouded by the outgrowth of negative emotions such as sorrow, loneliness, despair, rejection and so on, one’s self is concealed beyond recognition. Unless and until these unhealthy emotions are weeded out meticulously, the person who is mired in emotional chaos cannot get a clear picture of her true identity.

Maya Angelou started carrying the pain of personal trauma at the age of three, when she reached Arkansas to live with her grandmother, as an abandoned child, owing to her parents’ divorce along with her brother Bailey Jr. This incident had a dent on her self-esteem at a tender age, when love, joy, innocence should have been the predominant emotions. On the other hand, she suffered rejection, insecurity, sorrow fear and a sense of worthlessness. She had to enrol herself in a segregated Negro school⁵ due to colour discrimination. Right from the age of three, she and her brother were subject to utter poverty and suffering at the hands of white people in Arkansas. The oppression and supremacy of white people created a fear psychosis in her, and she struggled to comprehend the colour consciousness that invited much abhorrence from the whites. Not only this, Maya Angelou was abused and raped brutally by her

mother's boyfriend, Mr. Freeman, adding to her physical, emotional and psychological wounds that created emotional disturbances in her life. But Maya Angelou received an unwavering faith and spirituality on account of her childhood traumatic experiences of displacement and separation from her parents. She broke out of her troubled dark past to ascend to the heights of her spiritual intelligence. James Fowler in his classic work, *Stages of Faith*, put forth the view that faith offers coherence and direction to the life of a person and strengthens one to challenge the inevitable complications of the existential condition.

Daniel Goleman, the proponent of the theory of Emotional Intelligence upholds the view that emotions play considerable role in thought process and decision making. *Robert Frost* at the end of his poem, 'Mending Wall' says, "Good fences makes good neighbours." If boundaries are created for one's emotions and defended properly, it will help people keep themselves from being overwhelmed by their own and others emotions. Ravaged turbulent emotions, Angelou became anxious, fearful, depressed and socially inhibited person. But, luckily she became quite conscious of the power that the negative emotions can wield on individual, if one allows it to go unbridled. Angelou expresses her views in an interview published by O, The Oprah Magazine:

"I'm convinced that the negative has power. It lives. And if you allow it to perch in your house, in your mind, in your life, it can take you over. So when the rude or cruel thing is said—the lambasting, the gay bashing, the hate—I say, take it all out of my house! Those negative words climb into the woodwork and into the furniture and the next thing you know they'll be on my skin" (5).

As an antidote to such negative emotions, she indulges in religion and spirituality. It is explicit from the autobiographies and poems of Maya Angelou that spirituality developed through scriptures, reflection, prayers and othersimilar practices. When one nurtures one's spiritual intelligence one experiences a profound sense of meaning and purpose eventually transforming one's personality. Such a person then discovers the treasure hidden within—the myriad virtues, capabilities, talents and the intrinsic worth, and explores it with a clear sense of direction to add value to their own and others' lives resulting in self-actualization. The spiritual atmosphere that was present in the family which was created mainly by Maya's devout grandmother whose devout faith in God sowed the seeds of faith in her at a tender age of three! The unwavering faith witnessed in the members of her community in Arkansas, the sermons, the worship, church choir that enlivened her spirit and other spiritual practices in the Episcopal Methodist church round the week nurtured the spiritual elements within Maya to provide meaning to her life. She wrote a poem, '*On the Pulse of Morning*' and read out for President Clinton on his inauguration

Reading of Maya Angelou's *Caged Bird* clearly reveals the strong spiritual presence of her grandmother. *ElizabethFox-Genovese* (1988) impresses upon the strong presence of African American grandmothers:

For the most part these female elders are represented as rural in identification and origin, if not always in current location; immersed in folk communities; deeply religious; and the privileged custodians of the values and, especially of the highest standards of their people. They are not necessarily literate, and those who are literate are unlikely to spend money on any books except the Bible (71).

It is rightly said, that 'God helps those who help themselves'. The spirit of the self-help is the root of all genuine growth in the individual. Whatever is done for men or classes to a certain extent takes away the stimulus and necessity of doing for themselves and where men are subjected to over-guidance, the inevitable tendency is to render them comparatively helpless. This tendency of over-guidance and backing from her parents is lacking in the life of Maya Angelou. In the absence of such guidance in her traumatic life, she was left lonely to develop herself and improves her individual condition. That's why *Edward Gibbon* rightly pointed out that:

"Every person has two educations, one which he receives from others, and one, more important, which he gives to himself." (Samuel Smiles: p.276)

Maya Angelou too learned from others and from her personal traumatic experiences and comes out successful. Her life is an inspired example for other to follow and fight one's traumatic conditions by realizing one's worthiness.

Conclusion

The Autobiographies of Maya Angelou graphically describe the painful pages of the history of African American community with all uncertainties. The saga of the individual is undoubtedly interwoven with the history of the community. All the seven volumes of Maya Angelou's autobiographies earnestly record how the ideological,

institutional, interpersonal and intrapersonal aspects of racism, class, gender have disrupted their existence and derailed their progress. The racism based on colour line belittled the black Americans as objects and others and unnatural. *Selwyn R. Cudjoe* sums up the pith of Angelou's writing thus: "Angelou's Autobiographies . . . not only record her personal history but also that collective history of all the black women" (33).

In Maya Angelou's life, her grandmother was a source of her spiritual nourishment and was the driving force in developing Maya Angelou's spiritual intelligence. Maya Angelou believes that every individual is worthy of respect and desires attention and everyone is full of latent talents. Those who look within, will discover this treasure and those who make of this potential by venturing into the storms of life courageously will march towards victory and experience the joy of attainment.

Toni Morrison, also praises Maya Angelou and her talent as a writer of autobiographies with such an open-mindedness and candid delineation of her life and in this respect, there was none to compete with her. She noted that: "She was important in so many ways. She launched African-American women writing in the United States. She was generous to a fault. She had nineteen talents – used ten. And was a real original. There is no duplicate."(Ibid:1969, i)

Black women had to bear the stigma of racism, sexism, violence and slavery. Maya Angelou recommends to the Blacks to assert themselves and feel proud of their racial superiority and their Black skin. Maya Angelou recommends to the Blacks to cultivate faith in God, experience the joy of God, and to court patience and endurance to prevail over the circumstances. Angelou has established herself as the fitting and fully competent and authentic spokeswoman of the Black Women. She has effectively voiced the hopes and aspirations, the defeats, desolation and disillusionment and failures and frustrations faced by them in her works. Maya Angelou strongly argues in her oeuvre that life for the Blacks, chiefly the Black women must alter for the better in American society. This vision of a better world is the message of Maya Angelou but her life is her best message.

References

1. Angelou, Maya. *I Know Why the Caged Bird Sings*. New York: Random House, 1969. Print.
2. Labrecque, Ellen. *Who Was Maya Angelou?* New York: Random House, 1916. Print.
3. Mangal, S.K. *Advanced Educational Psychology*. New Delhi: PHI Learning Private Limited. 2018. Print.
4. Smiles, Samuel. *Self Help*. Fingerprint Publications: USA. 2018. Print.

Internet Sources

1. Als, Hilton. *Songbird: Maya Angelou takes Another Look at Herself*. The New Yorker, July 29, 2002. Web. 10 Jan. 2021. <<https://www.newyorker.com/magazine/2002/08/05/songbird>>.
2. Angelou, Maya. "Oprah Talks to Maya Angelou." *O, The Oprah Magazine* 2011.
3. Heidarizadeh, Negin. "The Significant Role of Trauma in Literature and Psychoanalysis." *Science Direct*, 13 Dec. 2014, <https://www.sciencedirect.com/science/Article/pii/S1877042815035648#!>
4. MohdLatiffAzmi, Nazri. "A New Beginning of Trauma Theory in Literature." *KnE Social Sciences/ The 1st Annual International Conference on Language and Literature*, April 19, 2019, <https://knepublishing.com/index.php/Kne-Social/article/view/1918>.
5. Balaeeve, Michelle. "Literary Theory Reconsidered." Springer, *Contemporary Approaches in Literary Trauma Theory*." 2014, <https://link.springer.com/book/10.1057/>

End Notes

1. James Arthur Baldwin was an American novelist, playwright, essayist, poet, and activist.
2. The black aesthetic is a cultural ideology that developed in America alongside the civil rights movement in the 1960s and promoted black separatism in the arts.
3. Emotional intelligence is the ability to understand, use, and manage your own emotions in positive ways to relieve stress, communicate effectively, empathize with others, overcome challenges and defuse conflict.

CHAPTER 9

A STUDY OF RESEARCH TOPICS IN MATHEMATICS THROUGH WEBSITES: AN EMPIRICAL STUDY

SMT. P. KAVITHA

Lecturer in Mathematics

PVKN Govt. College (A), Chittoor

Abstract





















Mathematics is the Queen of Sciences and without Mathematics, there is no Science. Most of the people is afraid to do Ph.D in Mathematics. To do Research in mathematics and to identify the Topic through some website, to acquire knowledge about the research concepts in Mathematics. By Using these websites on Mathematics any one can select the topic to do research in Mathematics and complete their field of study very easily. Thus, most of the research on mathematical concepts are available in the website. Fundamental Research Topics in Mathematics are provided below and some useful websites are also provided in the next page.






Some Research Topics in Mathematics

S.No	Name of the Topic
1.	Mathematical Science
2.	Mathematical Applications
3.	Science and Technology
4.	Engineering Mathematics
5.	General algebraic system
6.	Number theory
7.	Field theory and polynomials
8.	Commutative rings and algebras
9.	Geometry
10.	Matrix theory
11.	Topological groups
12.	Lie groups
13.	Real functions
14.	Measure and integration
15.	Functions of a complex variable
16.	Potential theory
17.	Ordinary differential equations
18.	Partial differential equations
19.	Dynamical systems theory
20.	Difference and functional equations
21.	Sequences, series
22.	Approximations and expansions
23.	Fourier analysis
24.	Abstract harmonic analysis
25.	Integral transforms
26.	Operational calculus
27.	Integral equations
28.	Functional analysis
29.	Operator theor

30.	Calculus of variations
31.	Optimal control
32.	Optimization
33.	Convex and discrete geometry
34.	Differential geometry
35.	General topology
36.	Algebraic topology
37.	Manifolds and cell complexes
38.	Global analysis
39.	Analysis on manifolds
40.	Probability theory and stochastic processes
41.	Optics
42.	Electromagnetic theory
43.	Statistical mechanics
44.	Structure of matter
45.	Relativity and gravitational theory
46.	Astronomy and Astrophysics
47.	Operations research
48.	Mathematical programming
49.	Game theory

2. Science and Technology Websites

S.No	Science and Technology Websites Links
1.	 quillbot.com
2.	 ut.ac.ir
3.	 cuni.cz
4.	 B bryk.pl
5.	 studiestoday.com
6.	 U ulisboa.pt
7.	 ugent.be
8.	 thecalculatorsite.com
9.	 umontreal.ca
10.	 alldatasheet.com
11.	 dergipark.org
12.	 ulaval.ca
13.	 NS newscientist.com
14.	 M muni.cz
15.	 phys.org
16.	 orcid.org
17.	 redalyc.org
18.	 slideplayer.com
19.	 manuscriptcentral.com
20.	 wordcounter.net

21.	 stayfocusd.com
22.	 iseeindia.org.in
23.	 duplichecker.com
24.	 scitechdaily.com
25.	 howstuffworks.com


3 Engineering Mathematics

S.No	Engineering Mathematics Websites	Address
1	https://www.ams.org/home/page	American Mathematical Society
2	https://www.engineersnovascotia.ca/	Engineers nova scotia
3	https://cms.math.ca/	Canadian math society
4	https://www.ewb-international.org/	Engineers Without Borders, International
5	http://math2.org/	Math2.org
6	https://siam.org/	Society for Industrial and Applied Mathematics
7	https://mathworld.wolfram.com/	Wolfram MathWorld

4 General algebraic systems websites

NS.No	General algebraic systems websites	Address
1	https://www.gams.com/	GAMS
2	https://encyclopediaofmath.org/	Encyclopedia of Math
3	https://cgasa.sbu.ac.ir/	General algebraic structure
4	https://link.springer.com/book/10.1007/978-3-642-65374-2	Springer Link
5	https://sciendo.com/journal/DMGAA	Sciendo

5 Number Theory

NS.No	Number Theory	Address
1	http://www.numbertheory.org/	Number Theory Web
2	https://www.springer.com/journal/40993	Springer
3	https://www.numbertheory.ai/	 A Newgen Software Company

6 Field theory and polynomials websites

NS.No	Field theory and polynomials websites	Address
1	https://euro-math-soc.eu/msc/12-field-theory-and-polynomials	European Mathematical society
2	https://projecteuclid.org/journals/communications-in-mathematical-physics/volume-121/issue-3/Quantum-field-theory-and-the-Jones-polynomial/cmp/1104178138.full	Project Euclid

7 Commutative rings and algebras websites

NS. No	Commutative rings and algebras websites	Address
1	https://sites.millersville.edu/bikenaga/linear-algebra/rings/rings.html	Millersville University
2	https://link.springer.com/book/10.1007/978-1-4939-0925-4	Springers.com
3	https://www.britannica.com/science/commutative-ring	Encyclopedia Britannia
4	https://projecteuclid.org/journalArticle/Download?urlid=ojm%2F1200691953	Project Euclid
5	https://arxiv.org/abs/2205.11431	ARXIV

8 Matrix theory websites

S.No.	Matrix theory websites	Address
1	https://link.springer.com/book/10.1007/978-1-4612-0653-8	Springers.com
2	https://www.lunduniversity.lu.se/lubas/i-uoh-lu-MATC70	LU.SE
3	https://www.worldscientific.com/worldscinet/rmta	World scientific

9 Geometry Websites

S.No	Geometry Websites	Address
1	https://www.homeschoolmath.net/online/geometry.php	Homeschool,math
2	https://www.geogebra.org/geometry?lang=en	geogebra
3	https://www.mathplanet.com/education/geometry	mathplanet
4	https://www.khanacademy.org/math/geometry	Khan academy

10 Topological groups websites

S.No	Topological Groups Websites	Address
1	https://www.lehigh.edu/~dmd1/othersites.html	Lehigh University
2	https://link.springer.com/book/10.2991/978-94-91216-35-0	Springer .com
3	https://www.lakeheadu.ca/sites/default/files/uploads/77/images/Spivak Dylan.pdf	Lakehead University
4	https://arxiv.org/abs/2208.10748	ARXIV
5	https://www.mdpi.com/journal/axioms/topical_collections/topological_groups	MDPL

11 Lie Groups Websites

S.No	Lie groups websites	Address
1	https://link.springer.com/book/10.1007/978-3-030-61824-7	Springer .com
2	https://math.mit.edu/~casals/M206.html	Massachusetts university of technology
3	https://www.math.stonybrook.edu/~jstarr/M552s22/	Stony brook university
4	https://www.britannica.com/science/Lie-algebra	Encyclopedia britannica

12 Real Functions websites

S.No	Real Functions Websites	Address
1	https://link.springer.com/book/10.1007/BFb0095388	Springer .com
2	https://www.educationworld.com/a_curr/mathchat/mathchat010.shtml	Education World
3	https://crma.stanford.edu/~jos/OnePorts/Properties_Positive_Real_Functions.html	Stanford university
4	https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:functions	Khan academy

13 Function Analysis Websites

S.No	Function Analysis websites	Address
1	https://www.sciencedirect.com/journal/journal-of-functional-analysis	Science direct
2	https://www.springer.com/journal/43034	Springer.com
3	https://sites.math.rutgers.edu/~sdmiller/musagei/	Rutgers university


14 Differential geometry websites

S.No	Function Analysis websites	Address
1	https://projecteuclid.org/journals/journal-of-differential-geometry	Project euclid
2	https://www.intlpress.com/jdg	intlpress
3	https://cse.umn.edu/math/differential-geometry	University of minnesola

15 Operation Research Websites

S.No	Operation Research Websites	Address
1	https://pubsonline.informs.org/journal/opre	informs
2	https://www.springer.com/journal/12351	Springer.com
3	https://www.theorsociety.com/	The operational research

References

1.  quillbot.com
2. <https://www.ewb-international.org/>
3. <https://link.springer.com/book/10.1007/978-3-642-65374-2>
4. <https://www.numbertheory.ai/https://euro-math-soc.eu/msc/12-field-theory-and-polynomials>
5. <https://euro-math-soc.eu/msc/12-field-theory-and-polynomials>
6. <https://encyclopediaofmath.org/>
7. <https://www.theorsociety.com/>
8. https://www.educationworld.com/a_curr/mathchat/mathchat010.shtml
9. <https://www.mathplanet.com/education/geometry>
10. <https://math.mit.edu/~casals/M206.html>

CHAPTER 10

ROLE OF AGRICULTURE MARKETING IN ECONOMIC DEVELOPMENT OF INDIA

G. YAMUNA¹ & C. VEENA²

Lecturer in Commerce, PVKN GC (A), Chittoor

Abstract

Agriculture is the most important part of India's economy and currently it is the leading farm producer in the world. Agricultural economy plays a significant role in providing employment opportunities to many people. Agriculture is the backbone; it supplies inputs to people and also to the industrial people. And however, there are many problems that have shown impact on the agricultural economy. The government of India also taken the following measures for supporting the agricultural economy by providing seeds and subsidies. And also the banks also like NABARD, and other financial institutions supporting them in the form of loans at concessional rates and also subsidies. Agricultural economy contributes to the national income and GDP. The government also supporting inputs for the farmers.

Keywords: Nabard, Government, Subsidies, Banks, GDP

Introduction

Agriculture marketing includes the buying and selling of agriculture produces. This definition is suitable for olden days, when the economy of rural areas was self-sufficient. Where the farmers had no problems in marketing their product as they used to sell their product directly to the consumers on a cash or barter system, marketing of agricultural produce is quite different from that in olden days, as it passes through a number of handles before it ultimately reaches the consumer. Agricultural marketing plays an important role in production and supplying of inputs to markets for consumption. Agriculture sector is also known as primary sector. After LPG 1991 the focus on agriculture is reduced. And they mainly focussed on industrial sector and service sector. But the agricultural products are exported to other countries after 1991. The market intermediaries are the main problem in the agricultural economy. And mostly cyclones and droughts also affects the agricultural production.

Objectives

The Objectives of the Study

1. To know about the role of agriculture in the Indian economy
2. To analysis the overview of agricultural marketing in present scenario.
3. To understand the significance of the agricultural marketing
4. To examine the problems and provide suggestions of the agricultural marketing

Research Methodology

This study is collected from both primary data and secondary data. The data collected from various journals, magazines, newspapers and some of the data collected from the rural farmers.

Role of Agriculture in The Economic Development

The agriculture sector is the backbone of an Indian economy; which offers the basic ingredients to mankind and now raw material for industrialization.

1. **Contribution to National Income:** Agricultural economy plays a crucial role in national income. Mostly 28 percent of national income. It supports the GDP
2. **Sources of Food Supply:** The agriculture is the main for all the world. Whether is developed or developing or under developing countries. And also heavy population to India. Agriculture shows a impact on all over the world

3. **Pre-Requisite for Raw Material:** Agricultural economy supports agro based industries in developing countries. It supplies the semi-goods and the industrial makes production and finalizes the products and supplies the products.
4. **Shift of Manpowers:** before or after independence mostly all people depends on agriculture. Mostly 50 percent above are dependent but now service sector has increased
5. **Helps in Reduces Inequalities:** agricultural economy helps to reduce inequalities from all rural and urban areas of the developing economy.
6. **Based on Democratic Notions:** it may result in growing annoyance amongst the masses which is not healthy for smooth running of the democratic government.
7. **Create Effective Demand:** The development of agricultural sector would relate to the increase the purchasing power of agriculturists which help the growth of the non-agricultural sector of the country. It will provide a market for increased production
8. **Support in Phasing out Economic Depression:** during recession industrial production can be stopped or reduced but agricultural production continues as it produces basic necessities of life.
9. **Foundation of Foreign Exchange for The Country:** majority of the developing countries of the world are the exports of primary products. Agro products contributes 60-70 percent of their total export earnings.

Importance of Agricultural Marketing



Problems of Agricultural Marketing in India

1. Improper ware houses for stocking of agricultural products
2. Lack of grading and standardization
3. Lack of transport facilities
4. No proper inputs to agricultural economy
5. No proper support for the agricultural sector
6. Intermediaries also major problem for agricultural marketing
7. Cyclones affect always on agricultural products
8. Service sector and industrial sector is dominating agricultural sector

Recommendations and Conclusions

1. Minimum support prices for the agricultural marketing
2. Removing intermediaries
3. Proper govt. support to agricultural marketing like supplying raw materials, and subsidies etc.
4. Bank support to agro marketing in the form of loans
5. Proper standardization
6. Proper warehouses like market yards or for selling of agricultural products for the farmers.

References

1. <https://bbamantra.com/agricultural-marketing/#:~:text=Agricultural%20marketing%20in%20modern%20days,Pisciculture%2C%20Rearing%20of%20Pigs%20etc>
2. <https://www.yourarticlelibrary.com/agriculture/agricultural-marketing/agricultural-marketing-in-india-concept-defects-and-remedial-measures/62869>
3. https://www.ijmra.us/project%20doc/2018/IJMIE_NOVEMBER2018/IJMIENov18-RajRy.pdf
4. <https://byjus.com/commerce/agricultural-marketing/>
5. <https://images.app.goo.gl/9cAKvqxD2wAifSw17>

CHAPTER 11

ROLE OF EXPERIENTIAL LEARNING-A LEARNER CENTRIC PEDAGOGY TO BRING OUT THE BEST IN HIGHER EDUCATION

P. BHANUPRAKASH¹ & T. HARI BABU²

^{1&2}Department of Chemistry, PVKN Govt. College (A), Chittoor, Andhra Pradesh

N. RAMAMURTHY³

³Department of Botany, PVKN Govt. College (A), Chittoor, Andhra Pradesh

Abstract

Student-centered methods are becoming increasingly important in higher education as they help to engage students and promote deeper learning by creating a more dynamic, engaging, and effective learning environment for students. Experiential learning is one of the most common student-centric teaching methods used in higher education. Experiential learning is a learning pedagogy that involves actively engaging in an experience, reflecting on that experience, and using that reflection to develop new insights, skills, and knowledge. The different experiential learning activities like hands-on laboratory experiments, service learning, internships, field exercises, etc. are discussed. In this review, we discussed about the importance of experiential learning in higher education.

Keywords: Student-centered methods, experiential learning, skills, internships, service learning, higher education.

Introduction

In higher education, student-centered methods promote deeper learning by creating a more dynamic, engaging, and effective learning environment for students. The common student-centric teaching methods used in higher education are project-based learning, experiential learning, problem-based learning, collaborative learning, inquiry-based learning etc. Experiential Learning is the process of learning by doing. This form of learning takes place outside the traditional classroom setting. By engaging students in hands-on learning experiences, they are better able to connect theories and knowledge learned in the classroom to real-world situations. Experiential Learning is identified as an effective learning pedagogy that supports the carrying out of a personalized approach of learning linked to a higher education framework. Experiential learning contains the elements like critical analysis, opportunities for students to take initiative, make decisions, and be accountable for the results and opportunities for students to engage intellectually, creatively, socially, or physically [1-2].

Characteristics of Experiential Learning

Experiential learning is a learning process that involves actively engaging in an experience, reflecting on that experience, and using that reflection to develop new insights, skills, and knowledge.

The characteristics of experiential learning are listed as follows:

- Experiential Learning is both student-centered and also learner-directed in nature. It requires learners to be actively engaged in the learning process but not passive recipients of the information. **(Active participation)**
- It emphasizes on the aspects of problem-solving, exploration, and inquiry. In experiential learning, students are challenged to apply their knowledge and skills to solve practical problems. **(Problem-solving)**
- Learner's emotions, attitudes, and values are all a part of experiential learning in which students are fully engaged in the experience and the learning. **(Personal involvement)**
- In experiential learning, learners are encouraged to reflect on their experiences and identify what they have learned. Reflection helps to transfer the learning to new situations. **(Reflection)**
- It is perception based in nature and often involves working in teams or groups. Through collaborative learning, students can share their experiences and benefit from one another. **(Collaborative learning)**
- It emphasizes the application of knowledge and skills learned to real-world situations. **(Application)** [3]
- A crucial aspect of experiential learning is feedback. The feedback that students receive on their performances enables them to better understand their strengths and weaknesses and improve their skills. **(Feedback)**

Different forms of Experiential Learning

Experiential learning is an engaged learning process whereby students “learn by doing” and by reflecting on the experience. The different forms of experiential learning activities are internships, apprenticeships, hands-on laboratory experiments, service learning, field exercises, onsite learning, role-playing, undergraduate research, studio performances, etc.

Internships

An internship is a broader term used to describe experience-based learning activities. It is an activity in a student’s field of interest not connected to a theoretical course and often bears a credit. Internships provide learners with opportunities to work in a professional setting and gain hands-on experience in a particular industry or field. The student may work with practicing professionals and complete a project. Internships can range from a few weeks to several months and are often focused on providing students with an opportunity to gain practical work experience and make industry connections. Internships can be paid or unpaid and are often taken by college students or recent graduates. Internships support the integration of theory and practice, explore career options, or foster personal and professional development.

Apprenticeships

Apprenticeships are typically more structured than Internships. Compared to internships, they involve a longer-term commitment and are more focused on developing a particular skill set. Apprenticeships typically last for several years and involve a combination of classroom instruction and hands-on training under the supervision of a skilled mentor. Apprenticeships are well-organized learning experiences that allow learners to work alongside a skilled professional in a particular field. By observing and participating in real-world work, students acquire practical experience.

Service Learning

Service learning involves combining community service with academic learning. students engage in a project/activity that benefits the community while also improving knowledge, values and skills. In these experiences, students participate in an organized service activity that meets identified community needs and reflects on the service activity to better understand course content and gain an appreciation of the discipline and an increased sense of civic responsibility.

Community service project (CSP) is an experiential learning strategy that integrates meaningful community service with instruction, participation, learning and community development. CSP involves students in community development and service activities and applies the experience to personal and academic development. CSP is meant to link the community with the college for mutual benefit. The community will be benefited from the focused contribution of the college students for the village/ local development. The college finds an opportunity to develop social sensibility and responsibility among students and also emerge as a socially responsible institution.

Fieldwork and Onsite Learning

Supervised student research carried out away from the college and in direct contact with the people, natural phenomena, or other entities being studied. Fieldwork is common in fields including botany, archaeology, sociology, social work, earth sciences, and environmental studies. This type of outdoor education involves learning in a natural environment, such as a wilderness area, botanical garden, national park, or local park. On-site learning involves industrial visits, advanced laboratory visits, field trips and a visit to heritage sites. Industrial visits for students provide exposure to industrial work culture.

Role Play

The role-playing method involves students taking on different roles and acting out scenarios. Students develop skills such as problem-solving, communication, and teamwork

Effectiveness of Experiential learning

Experiential learning actively engages students in the learning process, making it more enjoyable and memorable. When learners participate in experiential learning activities, they gain a better understanding of course material. It promotes self-learning and long-term retention of information and skills. It also promotes the development of critical thinking skills and enhances decision-making abilities among the learners. Through experiential learning, the learners gain hands-on experience that supports them to develop practical skills and expertise and in turn, apply their skills to solve real-world problems [3]. As experiential learning often involves working in teams, it promotes collaboration, teamwork and leadership skills. It can increase self-confidence in the learners. When learners participate in experiential learning activities, they gain a better understanding of course material [4].

Importance of experiential learning in higher education

In higher education, experiential learning has become increasingly important in preparing students for the demands of the workforce. Experience learning helps to bridge the gap between theory and practice. It provides students with the opportunity to apply their knowledge and skills in practical settings. Experience learning helps to develop significant skills like problem-solving, critical thinking, communication skills and teamwork skills that are essential for success in the workforce. Through this pedagogy, students are required to work collaboratively with others to find solutions to complex problems.

Experience learning provides students with valuable networking opportunities. Through their participation, students have the opportunity to meet professionals in their field and develop relationships with potential employers. This helps students to secure employment after graduation. It helps to boost self-confidence and self-esteem of learners which can be beneficial in all aspects of their lives. Through this learning method, students are exposed to different cultures, lifestyles, and perspectives which in turn helps to broaden their understanding of the world and develop empathy and tolerance for others. The learners are encouraged to handle difficult and challenging situations in the process of discovering new knowledge and acquiring skills [4].

In simple, experience learning is one of the valuable components of student-centric methods in higher education. The students get greater freedom in the learning process compared to conventional learning styles. As such, it is essential that higher education institutions continue to provide students with opportunities to participate in real-world experiences, and that students take advantage of these opportunities to prepare themselves for industry-ready.

Conclusion

Student-centric teaching methods prioritize student engagement, active learning, and critical thinking, and aim to help students develop essential skills for their future careers and personal growth. Experiential learning is a powerful approach to learning that emphasizes active participation, personal involvement, reflection, problem-solving, collaboration, feedback, and application of their knowledge and skills in a practical setting. Experiential learning can take many forms like internships, apprenticeships, hands-on laboratory experiments, service learning, field exercises, onsite learning, etc. but, they all engage learners in hands-on learning experiences. Experiential learning has been proved be a highly effective approach to learning and skill development as it actively engages learners, improves retention, develops critical thinking skills, fosters collaboration, builds practical skills, and increases confidence levels in learners.

References

1. Y. Kong, The Role of Experiential Learning on Students' Motivation and Classroom Engagement. *Front. Psychol.* 2021, 12:771272, 1-308.
2. X. Zhai, J. Gu, H. Liu, J.C. Liang, C.C. Tsai, An experiential learning perspective on students' satisfaction model in a flipped classroom context. *Educ. Technol. Soc.* 2017, 20, 198–210.
3. A.D. Zelechowski, C.L. Riggs Romaine, M. Wolbransky, Teaching psychology and law, *Teach. Psychol.* 2017, 44, 222–231.
4. J.A. DeGiacomo, Experiential learning in higher education, *The Forestry Chronicle*, 2002, 78, 245-247.

CHAPTER 12

DIGITAL CLASSROOM MANAGEMENT AND ITS TECHNIQUES

J. MOHANA VALLI

Lecturer in English

Govt. Degree College for Women, Madanapalle

Abstract

A well-managed classroom is a task-oriented and predictable environment says Harry Wong, the author of "The first days of School"

In a conventional mode of teaching, the teacher is the source of knowledge and learning is based on curriculum and content. Today's resources however are digital, interactive and visually rich; a stark contrast to rather lengthy text descriptions of topics and themes. Students are now at the centre of their learning and use today's technology and resources in ways that vary from traditional learning. Conventional learning is replaced by blended learning and traditional classroom is replaced by digital classroom. Traditional teaching and learning approaches have been transforming into blended, digital and interactive ones, so we need to plan carefully and prepare the learning environment. Having a management plan is essential while using digital learning tools as the teachers are beginners and are in the transition period. Classroom organization, instructional strategies, technical knowledge, technology availability and time are the some of components that cover in classroom management.

This paper highlights, Jones's six principles by which teachers can organize their classrooms effectively and Kounin's theory of classroom management.

Keywords: Classroom management – Blended teaching- Jones's principles- Kounin's Theory

“An effective teacher manages a classroom, an ineffective teacher disciplines a classroom”

- Harry Wong

Good classroom management is the art of dealing with problems positively and looking for solutions together so that everyone is involved and willing to find a remedy”. The responsive classroom approach creates an ideal environment for learning – every teacher should know about it. Being able to communicate clearly, coordinate and motivate others as well as plan tasks effectively are vital skills that all managers need. Management skills are important because they help any institution run like a well-oiled machine. This is applicable to the classroom as well.

In the digital era, a teacher is more than an instructor. He is also a facilitator, guide, coach, and perhaps most importantly a classroom manager. In fact, online teaching and blended learning have totally changed the role of a teacher. After all effective teaching and learning cannot take place in a poorly managed classroom. Classroom management refers to a wide variety of skills and techniques used by teachers to facilitate optimal conditions for learning. Classroom management involves preventing and intervening in disruptive behaviour. But it is also about creating the right environment setting clear expectations and thoughtfully choosing learning materials and activities. Simply put, an effectively managed classroom is one that runs smoothly and where both students and teacher can be their best selves. It's a structural space for learning, with minimal confusion and downtime. There are clear classroom norms, as well as consequences that reduce behaviours that get in the way of learning, in this type of classroom students, are organized, focused, attentive to tasks and productive.

According to Jones, the studies of teacher effects have established six principles by which teachers can organize their classrooms effectively.

First, teachers can prevent a large percentage of classroom disruptions by effectively organizing their classrooms at the beginning of the academic year. This involves arranging the room and materials for orderly movement and taking the time to teach students the classroom procedures and behaviours that are expected of them. Teachers should tell students what to do on first entering the classroom how to behave during large and small group instruction and seat work activities, how to respond to activities, how to respond to classroom interruptions, the appropriate procedures for leaving the classroom and for moving and talking within the classroom and how violations of these classroom procedures will be handled. Secondly, effective classroom teachers understand the importance of positive teacher /student relationships. Such teachers

1. Monitor their ability to involve all students – not just high-ability students in the learning process.
2. Work to develop warm and positive relationships with students so that the students feel accepted and invited to learn.

Third, Jones says that teachers should plan classroom activities that help students become better acquainted with one another and learn to work cooperatively. Disruptive behaviour is minimized and learning is enhanced when students act positively and support one another's support.

Fourth, teachers should examine their instructional methods and materials to determine whether these methods and materials are appropriate for the students they are teaching and for the learning goals they have established. Effective teachers use a wide range of instructional strategies and materials to meet individual needs and obtain desired learning outcomes. Fifth, teachers can learn to use specific teaching methods that minimize disruptions and maximize learning. According to Jones, the research on teacher effects suggests that effective teachers are skilful at

1. Introducing lessons
2. Giving clear instructions
3. Maintaining student's attention
4. Pacing lessons
5. Using seat work effectively
6. Summarizing
7. Giving students useful feedback
8. Making smooth transitions from lesson to lesson
9. Handling minor disruptions

Finally, effective teachers have problem-solving and counselling skills that enable them to deal effectively with the disruptive behaviours that sometimes occur despite their best efforts to create a positive learning environment and to plan well-organized and interesting lessons.

Clay P. Bedford says "you can teach a student a lesson a day, but if you can teach him to learn by creating curiosity, he will continue the learning process as long as he lives."

Nowadays we are living in an age of information and knowledge is everywhere, we need to ignite the learner's mind to go in the right way and to gain proper knowledge and wisdom. One should be beware of false knowledge as it is more dangerous than ignorance.

Douglas Nimmo asks a very important question for teachers who are trying to find ways to improve their classroom management.

"Is it our job as educators to establish 'classroom control, or are we to endeavour to create a healthy classroom environment?"

Supporting, developing, ordering and productive classroom environment is the foundation of good classroom management says Dr. Carolyn Evertson.

The four Cs of classroom management Commendation, communication, consistency and content- represent one of the quickest and most successful environments at any level, especially in elementary schools.

The five rules to create a framework for a classroom are as follows

1. Enter quietly
2. Participate with the class
3. Show respect for yourself, others and the materials
4. Try your best
5. Exit quietly

Kounin's Theory and Classroom Management

Kounin believed that in order for a teacher to have an effective connection between management and teaching, there needed to be good lesson movement. This lesson movement is achieved through a ripple effect, withitness, overlapping, momentum, smoothness and group focus.

Ripple Effect

The “Ripple effect” occurs when the teacher corrects misbehaviour in one student, and this positively influences the behaviour of other nearby students. The ripple effect is influenced by the clarity and firmness of the correction. The effect is greater when the teacher clearly names the unacceptable behaviour and gives the reasons for the desist.

Withitness

“Withitness” is a term created by Kounin to describe the teacher’s awareness of what is going on in all parts of the classroom at all times. We commonly refer to this as “having eyes in the back of the head.” To be effective, the students must perceive that the teacher really knows what is going on in the gymnasium. If students are off-task and fooling around, the teacher sees that they are not working and they need to get started. Withitness can be improved with practice, such as learning how to effectively use systematic techniques to scan the class.

Overlapping

Overlapping is attending two or more events at the same time. For example, the teacher can give a student individual feedback at one station and at the same time, offer a quick word of encouragement to students who are working at another station. Kounin found that teachers who are working at overlapping were more aware of what is going on in the classroom or demonstrated withitness. Students are more likely to stay on task if they know that the teacher is aware of what they are doing and can help them when needed.

Transitions

Student behaviour is influenced by the smoothness and effectiveness of transitions between tasks in a lesson. Failure to gain the student’s attention, unclear and confusing directions, using lengthy explanations, dwelling too much on the details rather than focusing on key points, and allowing students to take too much time moving from one task to the next contribute to student misbehaviour. Well-established routines, a consistent signal for gaining the class’s attention, clear directions, preparing students to shift their attention from one task to another, and concise explanations that highlight the main points of the task help reduce student misbehaviour. Kounin found that smooth and effective transitions are one of the most important techniques in maintaining student involvement and class control.

Group Focus

The ability to keep members of the class or group paying attention to the task is essential in maintaining an efficient classroom and reducing student misbehaviour. Effective grouping maximizes active participation and keeps students engaged in learning. Accountability is a powerful force in keeping students on task.

Maintaining Interest and Involvement

Satiation, which means being satisfied or having, is used by Kounin to describe student’s progressive loss of interest in the task. When students experience satiation or boredom, other behaviours emerge. Students may introduce variations into the task, work mechanically on the task without giving it much thought, or try to create some excitement through fooling around with a classmate or engaging in other forms of misbehaviour. Kounin suggests reducing satiation by providing students with a feeling of progress, offering students challenges throughout the lesson, and feeling enthusiasm. Variety reduces satiation and alleviates boredom. Changing the level of challenges, restructuring groups, extending the task and using different teaching styles and variety to the lesson

Class Dojo

Class Dojo is an educational technology company. It connects primary school teachers, students and families, through communication features, such as a feed for photos and videos from the school day, and messaging that can be translated into more than 35 languages. It also enables teachers to note feedback on students’ skills and creates a portfolio for students, so that families can be aware of school activities outside of meeting with teachers. The ClassDojo allows teachers to record and score the students’ behaviours by tagging them. This is an app that allows teachers, parents, and students to have access to students’ information. This type of app can be used for effective classroom management.

Conclusion

Implementation of Jones's principles and Kounin's techniques for digital classrooms can reduce student misbehaviour, indiscipline, and distractions and contribute to a positive learning environment. Though these techniques and strategies are applicable at the school level, they can be implemented in digital classrooms at all levels of the education system.

Effective digital classroom management has been one of the major concerns for teachers. It was only one turn to the blackboard to get all the mayhem and chattering started. Not only naïve teachers, but even experienced ones also suffer from this mismanagement now and then. This paper curated a list of some easy and practical classroom management techniques that one should use to manage classrooms effortlessly.

References

1. Strother, Deborah Burnett. "Classroom Management." *The Phi Delta Kappan*, vol. 66, no. 10, 1985, pp. 725–28. *JSTOR*, <http://www.jstor.org/stable/20387499>. Accessed 24 Mar. 2023.
2. Jill Reese. "The Four Cs of Successful Classroom Management." *Music Educators Journal*, vol. 94, no. 1, 2007, pp. 24–29. *JSTOR*, <http://www.jstor.org/stable/4539645>. Accessed 24 Mar. 2023

CHAPTER 13

INTERTWISTED AND INTERWEAVED LIVES ON EARTH

Dr. T. SAI MAMATA

Assistant Professor, Department of English
Andhra Loyola College, Vijayawada

Abstract

What makes life happy? What makes life miserable? Obviously, the answer would be family and fame. If it is so, why are people from well-to-do and well-off families suffering? It is obvious that money cannot buy happiness, it just adds comforts to a normal life. A person who lives in satisfaction is the richest person on the earth. No one can compete with him. We know life is not a bed of roses for everyone. One may struggle for sustenance and survival; on the other hand, it may be easy for some. So, according to our assumption the former should be jealous of the later and the later should be grateful for what he has. Is it so? But what is happening in reality is contrary to the assumption. Neither the rich nor the poor are happy. There could be myriad reasons for this aspect of human predicament. As a matter of fact, jealousy is the emotion that ruins a life. Some times the price people pay for being jealous is incalculable. Human beings crave for the things that are unattainable and, in the bargain, losing things that are attainable. Jealousy makes one's life miserable. It pushes them into the abysmal depths of a pretentious world. With utmost difficulty even if they survive, they realize that they have missed all the precious memories and moments of their life. Sometimes, they can't even repent for their deeds. When I think of jealousy or over ambitiousness, the novel that comes to mind immediately is *The Kite Runner* written by Khaled Hosseini. Amir, who is brought up by a humanitarian father wants to out shine Hassan, a man from a minor ethnic community. Hosseini skilfully handles the sensitive relations between the two toddlers, grown up young boys and later married young man. The present article is going to focus on how repentance relieved a man from the guilt he had carried for decades despite crossing the countries and oceans.

Keywords: Afghan people, true love, sacrifice, migration and so on

The Root

Khaled Hosseini, an Afghan by birth, doctor by profession, writer by passion, humanitarian and philanthropist by nature presents a pellucid picture of his home land Afghanistan. His voice truly represents his agony for the suppressed and depressed life behind the serene and beautiful landscapes of Afghanistan. His ease and zeal to present the true picture of Afghans is highly appreciable. Generally, for every individual, the most beautiful part of his life is his childhood. Wherever they may settle, whatever they may be, however they may be, when childhood memories flash in their mind, they become nostalgic. Hosseini has scripted a beautiful childhood he had spent in Afghanistan. May be his inspiration behind the scenes of flying kites has sprung from his memories of flying kites as a kid. Though he moved to different countries along with his father, who worked in the Embassy of Afghanistan, he cherished the memories of Afghanistan motivating him to start Khaled Hosseini's Foundation to help the Afghans in need.

Being more personal, though many critics claim the debut novel melodrama, *The Kite Runner* written in 2003 won Hosseini the fame of being one of the best notable writers of the 21st century. He makes people realize how wars effect personal relations, sometimes destroying a generation. Though he focuses on the tranquil Kabul mountains, the pain of wars is echoed through the breeze. He knew the pain of not returning back to his hometown as Afghanistan was under the control of the Soviet Union and they had to settle in United States of America. Crossing the cultural shocks, he excelled in his studies and started his career as a medical practitioner. Of course, he wrote *The Kite Runner* holding a two-fold position, practice on one hand and writing on the other. Fortunately, after the huge success of the novel, he left his profession and chose writing as his career. If he had not done it, readers would have missed the great chance of reading his other heart touching novels *A Thousand Splendid Sons* and *The Mountains Echoed*.

Life in Glee

As the novel is well-known for its story-telling technique, it begins with the present, but dating back to the haunted memories of the past, when Amir the protagonist receives a phone call. Hasan and Amir remained as friends through thick and thin. When one want to judge the attitude of people, certainly what comes first is humility. Hassan who belongs to Hazara, an ethnic minority group is meek and modest. On the other hand, Amir who comes from a rich people is conceited in his thoughts and feelings. Two people can be friends, when brought up in the same household or neighbourhood, but it necessarily need not be that they are good friends or best friends. Certainly, status plays a vital

role in making friends. Amir always feeling uncertain and diffident that he was a disappointing son to his Baba. May be this could be one of the reasons for his inferiority complex which haunts him throughout his life. Like most children have beautiful memories linked to their childhood, Amir and Hassan also recorded a lovely play world.

Unfortunately, both had no mothers and were taken care of by their fathers. As kids they read stories, flew kites and climbed trees. The innocence commonly found in kids of their age was no exception to them. Though Amir was sent to school and Hassan had to work in the house, they were happy. Amir's insecurity and Hassan's maturity were distinctly depicted making the readers to assess how individuals shape their personality adopting and assimilating their surroundings. It is obvious that more than external factors, everyone's internal attitude is what shapes their personality. Of course, Baba, Rahim Khan, Baba's friend and Ali, Hassan's father do not show any favouritism between the kids. But Amir feels tormented when he sees Hassan and wants to get rid of him. Is it that he feels that Hassan belonging to a minority group should not be given importance or is it that he couldn't tolerate the matured attitude of Hassan. Whatever it was, Amir and Hassan shared a beautiful childhood until Amir's brain was befouled and confused by inferiority complex.

Impact of Political Turbulence on Individual's Life

Man being the part of society is always influenced by the economic and social impact. Be it a war or economic crisis, the most affected are the innocent civilians. For every individual, childhood reminiscences will never be obliterated. "When we were children, Hassan and I used to climb the poplar trees in the driveway of my father's house and annoy our neighbour's by reflecting sunlight into their homes with a shard of mirror" (*The Kite Runner*, 2003, 3). What an exciting and exhilarating recall. As the Russians invaded Afghanistan, many people were forced to flee from their home land. Baba and Amir left to Pakistan and later moved to Fremont, California. But the miles of distance could never mitigate the effect of Amir's mind and the feeling persisted as a perennial.

Sports and games generally make people sportive. In the winter Kite-fighting tournament, Amir wins the tournament but completely loses his self. Hassan goes to retrieve the losing kite and when Amir follows him, he finds that Hassan was trapped by Assef, Wali and Kamal and was violently raped. He neither tries to save him nor tries to console him. Victory couldn't teach Amir the real lesson of life. Winning is not about receiving an award but giving some confidence that one has the ability to do, it makes one a warrior. But where has all these gone? Why did Amir run away like a coward? If Hassan were in his place, undoubtedly, he would risk his life to save Amir. Amir's guilt degraded him more and he played cheap tricks to send Hassan away. Though Baba, pleaded he could not stop them. For the first time in his life, Amir saw his father crying. "I'll never forget the way Baba said that, the pain in his plea, the fear" (*The Kite Runner*, 2003, 100).

The two friends drifted apart. But if Russians hadn't disturbed Afghanistan, there might had been a chance for the friends to reconcile. Unfortunately, loading moving scenes of the past on the way of their journey, Amir left to an alien world. Baba, a man who led a luxurious life had to work in a gas station for his survival. Time and tide wait for none, Amir becomes a writer and marries Soraya, the daughter of Baba's friend General Taheri. Baba diagnosed with lung cancer passes away. The conditions in Afghan prevented them from returning to their country and they could never enquire about Ali and Hassan. May be whatever is in dark has to come to light one day or the other. After many years, Amir who is settled, leading a happy and secured married life, receives a phone call from Rahim Khan, who unravels the skeleton in the cupboard. An unexpected and unforeseen truth. Amir could now understand why his father was so generous to Hassan, because father's love is unconditional. Though he couldn't tell that Hassan was his son to the world, the reality never fades away. After his death, Amir comes to know that Hassan was his half-brother.

This Is What I Am

May be in one way or the other, Baba's words had a negative effect on Amir's mind. Baba always felt about Amir, "A boy who won't stand up for himself becomes a man who can't stand up to anything" (*The Kite Runner*, 2003, 22). Of course, this is true, but after he returned to Afghanistan, Amir proved that he was a real man. He fights tooth and nail to save Sohrab, Hassan's son and takes him to America. Regrettably, depressed with the disastrous effects on his life, Sohrab remains withdrawn. Though the readers feel Amir was incapable in the first part of his life, his struggle to

take Sohrab back with him really moves the readers. A boy who couldn't tolerate the humbleness and reservedness of his friend Hassan found the same quality in his son, Sohrab and embraced him. Truly a matured behaviour. Now Amir could stand up winning the real race of life.

Amir and Hassan are two sides of a coin. Perhaps when raised by the same people, whatever may be the circumstances, their hidden inherent qualities outshine their real personality. Had Amir ignored the phone call, his guilt would have remained with him forever. Hassan and Sohrab taught him more than what he learned from his books. Both the father and the son saved him with their skills by throwing the slingshots. Amir admits his culpability to his wife Soraya and once again proves that his father was wrong in assessing him. He struggles hard for Sohrab to give him a life which he missed with his parents. He moves heaven and earth to get the boy adopted and migrated to United States of America. Despite the dreadful situations, he never gives up. The readers are at times stupefied to match young Amir with grown-up matured Amir. The way he treats his wife, the way he nurses his father moves the readers. This is the persona of a true man.

Conclusion

A kite flies high making one to realize that whatever may be the situation it moves on, trying to touch the sky. It falls when it cannot hold. Kite runners struggle hard, bear the pain, but never drop their kite. It is a sport that makes one to think high and achieve high. Amir who is fond of kites and wants to win the race, could not act in the same manner when it was about Hassan. He was guilty of his cowardice, but instead of making things better, he makes them worse by hiding money and watch under Hassan's pillow making him a thief. Though Baba doesn't allow them to go away, they move away from Amir's house and life. He thought he would be relieved from the remorse, but it burnt him making him feel repentant throughout his life. When he returned to Afghanistan, he was haunted by the memories of Hassan. When he comes to know that Hassan and Farzana had left the world and their only son, Sohrab was orphaned. He spares no effort to find him and takes the boy with him. At the end he is relieved from all the torments that didn't allow him to lead a peaceful life. As the Daily Telegraph says, it is "A devastating, masterful and painfully honest story of a life crippled by an act of childhood and cowardice and cruelty.. It speaks the harrowing truth about the power of evil, personal and political, and intoxicates, like a high-flying kite, with the power of hope" (*The Kite Runner*, 2003, Cover Page).

References

1. Bhat, Nadeem Jahangir. *Sin and Redemption in Khaled Hosseini's 'The Kite Runner'*. The Criterion: An International Journal in English, Vol.6, No.2, pp 283-286. 2015.
2. Bloom, Harold, (ed). *Khaled Hosseini's 'The Kite Runner'*. New York: Infobase Publishing, 2009.
3. Hosseini, Khaled. *The Kite Runner*. Bloomsbury Publishing, London, New Delhi, New York and Sydney, 2003.
4. Winkler, L.K. *A Study Guide to Khaled Hosseini's 'The Kite Runner'*. New York: Penguin Group, 2007.

CHAPTER 14

ASSISTANCE OF TECHNOLOGY IN ASSISTING SUICIDE AND EUTHANASIA

Dr. G. INDIRA PRIYADHARSHINI

B.Sc, L.L.M, Ph.D, Assistant Professor, Department of Law, SPMVV, Tirupati

P. SOWJANYA

Research Scholar, Department of Law, SPMVV, Tirupati

Introduction

Euthanasia is an act which ends the life of a terminally ill person who is undergoing a great suffering. Euthanasia means a good death. A process adopted for easy way of death. This concept has been evolved from the thought of avoiding the sufferings. It is considered as practice of dying with dignity. When we see through the history “vinadhainyenajeevitham - sunayasenamaranam” is the prayer which is done by everyone in Hindu community. It is an age old practice. Every one seeks the blessings from the god to have “vinadhainyenajeevitham” which means to have a life without suffering and “sunayasenamaranam” which means at the time of death the death should be in the easiest form. But this doesn't mean the Hinduism accepts suicide. In sanathana dharma suicide is the heinous crime. Even great maharshis took birth just to finish their karma and to attain mukthi. When it comes to the medieval history the dominance of the greek ideology was very high. Euthanasia is derived from two greek words namely ‘eu’ with meaning good and ‘thanatos’ with meaning death. By combining those greek words which yields ‘euthenasia’ with meaning good death. Technology is a process adopted for the sake of convenience and comforts. Etymologically the word technology is derived from a greek word ‘*technologia*’ which means a systematic treatment. The systematic treatment or otherwise called application. Hence the technology is a systematic treatment or application of scientific method for the purpose of bringing solutions in instructional problems. Initially, so many tools were invented for the purpose of solving the problems, with that they achieved human's wants, needs and desires. Now the human wants extended to seek comfort and convenience even in death.

Initially technology was used in medical fields to save humans form death and to try to increase the life span. There is no denial in the statement that technological development in medical field increases the life span of the people [vaka,2018].Coronary artery bypass graft surgery [CABG] in short ‘bypass surgery’ could be a biggest and popular example for this. Of course the advancement of technology in medical field reduces the suffering and pain from the disease. Now a days, robots are doing the surgeries to avoid the probability of mistakes. However Medical-technological interventions can extend life, but with the cost of protracted suffering. Technological assistance in diseases associated with chronic conditions like cancer and cardiovascular disease results in long and debilitating trajectories [Steck N, 2013].

Defnition of Euthanasia and Its Types

Francis bacon (1561-1621) was the first to discuss prolongation of life as a new medical task. He coined the name euthanasia in 17th century. Euthensia is defined as “administration of a lethal agent by another person to a patient for the purpose of relieving the patient's intolerable and incurable suffering” [McMurray, 1992].

Physicians carry out euthanasia, which has also been classified as "active" or "passive." Active euthanasia is when a doctor consciously takes steps to end a patient's life. Withholding or discontinuing life-sustaining care is referred to as passive euthanasia. Active euthanasia comes in three types. One type of active euthanasia that is carried out at the patient's desire is voluntary euthanasia. Involuntary euthanasia, commonly referred to as "mercy killing," entails taking a patient's life against his will in order to end his agony and suffering. Nonvoluntary euthanasia is carrying out the procedure even while the patient is unable to provide consent. [Yount L, 2000]

Legalization of Euthanasia

Euthanasia and Physician assisted suicide falls under the act of **homicide** which means killing a person by another. *Homicide* can refer to a noncriminal as well as a criminal act of murder. Legal system makes important distinction between different types of homicides.

Some homicides like killing of a person to prevent serious felony or to aid a representative of the law are considered as justifiable.

Some homicides are said to be excusable when a person kills in self-defense.

Punishments for homicide differs greatly according to the intention and conduct of the killer and the circumstances of the act.

The use of high-dose painkillers to treat a patient's suffering that could expedite death (often referred to as the rule of double effect) or even the removal of life support have both been legally and morally separated from euthanasia and PAS [Emanuel EJ, 1988].

In 18th century Prussia passed a law which reduced punishment to a convict who killed a patient with incurable disease. Latter nineteenth century, active euthanasia was favored by social conditions. "Killing law" was a book prepared by a German philosopher, Jost in 1895. In the initial years of 20th century efforts to legalize euthanasia started in USA.

In the District of Columbia and 10 American states, physician assisted suicide is permitted. In Colorado, the District of Columbia, Hawaii, Maine, New Jersey, New Mexico, Oregon, Vermont, and Washington, it is a choice that is legally available to people. Individuals in Montana and California have the choice, according to a court ruling. A terminal disease and a prognosis of six months or fewer for survival are prerequisites. The prescribing of drugs to accelerate death cannot result in legal action against doctors [Compassion and Choices,].

As a result of new thought process towards the elderly and the terminally ill, during 1990s the legal definition of homicide in the American and European societies changed. With the wide spread of "right to die" movement legalization of certain forms of euthanasia and physician-assisted suicide is happened.

Francis Bacon (1561-1621) was the first to discuss prolongation of life as a new medical task. In 18th century Prussia passed a law which reduced punishment to a convict who killed a patient with incurable disease. Latter nineteenth century, active euthanasia was favored by social conditions. "Killing law" was a book prepared by a German philosopher, Jost in 1895. In the initial years of 20th century and efforts to legalize euthanasia started in USA.

Euthanasia is still clogged under confusion in India. There is no law specifically deals with euthanasia in India. Indian Penal Code (IPC) S. 309 deals with the attempt to commit suicide and abetment of suicide is dealt by S. 306 of the IPC – both actions are punishable. In the Honorable apex court of India, always there is an ongoing debate on Article 21 of the Indian constitution which explains the right to life and personal liberty whether includes right to die or not. If so, what is the authority and validity of section 309 and section 306 of the IPC?

There are so many case laws which deals with suicide.

In *Maruti Shripati Dubal v. State of Maharashtra* (1986) case for the first time the Bombay High Court considered the Constitutionality of Section 309 of Indian Penal Code, 1860. S. 309 of the Indian Penal Code was struck down by this honorable Court, on the ground that this provision is being violative of Articles. 14 and 21.

In *Chenna Jagdishwar vs. State of Andhra Pradesh* (1988), it was decided by the Andhra Pradesh High Court that the right to die under Article 21 is not a fundamental right of the Indian Constitution, and hence the S. 309 of IPC is not unconstitutional.

The Bombay High Court's decision in *State of Maharashtra v. Maruti Sripati Dubal* (1986), was upheld by the Supreme Court In the case of *P. Rathinam v. Union of India* (1994) by observing that a person has the right to die. The apex court also declared that Section 309 is unconstitutional. Lot more different opinions were put forth in this present case that the Apex Court.

In *Gian Kaur* case (1996), Art. 21 of Indian constitution - under which the right to life is guaranteed, does not include the right to die or the right to be killed was held by the Supreme Court's constitutional bench and also made some clarity by providing observations which decides whether S. 309 of the Indian Penal Code of 1860 is constitutional or not.

At a meeting of its ethics committee in February 2008, the Medical Council of India expressed its opinion on euthanasia, saying that doing so would be immoral. However, in some circumstances, the decision to remove supportive equipment to maintain cardio-pulmonary function even after brain death must be made by a medical team and not only the treating physician. The termination of support systems must be authorised by a medical team. The patient's doctor, the hospital's chief medical officer or medical officer in charge, and a doctor chosen by the hospital's in charge from among the hospital personnel or in line with the Transplantation of Human Organ Act, 1994, should make up this team [Mishra, V. (2016)].

On March 7, 2011, a significant advancement in this sector occurred. In a momentous decision, the Supreme Court approved passive euthanasia. A two-judge bench refused to perform a mercy killing on ArunaShaunbag, who had been in a vegetative condition in a Bombay hospital for 37 years, and instead established stringent rules under which passive euthanasia may be made permissible under the supervision of the supreme court. The court additionally declared that the patient's parents, spouses, or close relatives might submit such a request to the high court. Upon receiving such a request, the top justices of the high courts would form a bench to hear it. A committee of at least three eminent physicians would be appointed by the bench to advise them on the topic. [The Telegraph. 2011 Mar 6th]

Assistance of Technology in Death

While it is lawful to commit suicide in Australia, helping someone else kill themselves is against the law. Dr Philip Nitschke sought to discover means by which individuals, particularly those who were suffering excessively from terminal conditions, may make the decision to end their lives without involving others. Exit International was founded by Nitschke to aid in this endeavour. The majority of the members are senior citizens who want to pass away peacefully. Members of Exit include retired engineers, chemists, and other technical professionals interested in discovering ways to pass away that meet a number of criteria, including allowing for a peaceful death, being controlled by the individual passing away, and being relatively easy and inexpensive. Exit's initiatives are a part of a larger global search for or development of technology [Ogden, (2001)].

One method — is to purchase pentobarbital — a barbiturate well known by its brand name Nembutal — at a veterinary supply shop, and then consume the appropriate dosage. If the directions are followed, the death is swift, simple, and reliable.

Another method - uses a device known as an escape bag. When the inert-gas nozzle is opened, the bag is inflated, exhaled into, pulled down over the subject's head, and a deep breath is taken. This immediately results in unconsciousness and minutes later, death. [bbc news, dec 9th,2021].

Then he developed a suicide machine. The machine wasn't much to look at: it was essentially a laptop hooked up to a syringe. But it achieved its purpose.

It is just a matter of time until ultra-technology enters the situation, especially considering that we are in the digital health era and that governments prefer to legalise assisted suicide and euthanasia. In fact, reports regarding a company creating a 3D-printed capsule for use in calm aided suicide, without the necessity for a doctor or other trained individual, and that may be lawfully run in the nation, surfaced in December 2021. The designers want to de-medicate the dying process, and they even intend to incorporate an AI system to determine the user's mental competence prior to allowing them to use the gadget. Before losing consciousness, the user will experience some disorientation and even a little sense of euphoria, says Nitschke. "Oxygen and carbon dioxide, as well as hypoxia and hypocapnia, cause death." [The Medical Futurist, 18th Jan,2022].

Nitschke became "Dr. Death" or "the Elon Musk of assisted suicide" to some—is overseeing the last few rounds of testing on his new Sarco machine on 12th October, 2022 before shipping it to Switzerland, where he says its first user is waiting [MIT Technology Review, 13thoct, 2022]. As Switzerland permits innovative 3D-printed capsule for assisted suicide.[Anna Engberg, Dec 07, 2021].

Nitschke hopes an algorithm that can carry out a psychiatric assessment will be the next step. Rhema Vaithianathan, the director of the Centre for Social Data Analytics and a professor at the Auckland University of Technology in New Zealand, who focuses on tech in health and welfare, thinks it is right that people are asking AI to help make big decisions. "We should be addressing problems that clinicians find really hard," she says. Vaithianathan

and her colleagues have tried to develop a machine-learning model that can predict which patients are most at risk of future self-harming behavior and which are not, using a wide range of data, including health records and demographic information, to give doctors an additional resource in their decision-making. “I’m always looking for those cases where a clinician is struggling and would appreciate an algorithm,” she says. The project is in its early stages, but so far the researchers have found that there may not be enough data to train a model that can make accurate predictions. A review published in 2021 highlighted 43 studies by researchers claiming to use machine-learning models to predict whether patients will be readmitted or die after they leave hospitals in the US. None were accurate enough for clinical use, but the authors look forward to a time when such models “improve quality of care and reduce health-care costs.” [Will Douglas Heavenarchive, oct 13, 2022]

Conclusion

Technology will assume the task until we accept euthanasia as the norm, which is an ethical issue. Although euthanasia is becoming more civilised and accepted, the medical community still needs to be more actively involved. Before realising that their time has come, dying patients generally go through various phases of mental adjustment. And the question of who or what should step in arises if the agony before to death lasts longer and becomes agonisingly intolerable [Dr. Adam Tabriz, Nov13, 2022].

References

1. Decisions near the end of life. Council on Ethical and Judicial Affairs: American Medical Association. *JAMA*. 1992; 267: 2229–33. [PubMed] [Google Scholar]
2. Emanuel EJ. Ethics of treatment: Palliative and terminal care. In: Holland J, editor. *Psycho-oncology*. New York: Oxford University Press; 1988. pp. 1096–111. [Google Scholar]
3. Mishra, V. (2016). The views of Dr. Vedprakash Mishra, Chairman, Academic Committee of the Medical Council of India, New Delhi. *Current Medicine Research and Practice*, 3(6), 140.
4. Ogden, R. D. (2001). Non-physician assisted suicide: The technological imperative of the deathing counterculture. *Death Studies*, 25, 387-401.
5. Steck N, Egger M, Maessen M, et al. Euthanasia and assisted suicide in selected European countries and US states: systematic literature review. *Med Care* 2013;51:938-44. [Crossref] [PubMed]
6. Yount L. *Physician-assisted suicide and euthanasia*. New York: Facts On File, Inc; 2000. [Google Scholar]
7. <https://www.bbc.com/news/technology-59577162>
8. <https://compassionandchoices.org/resource/states-or-territories-where-medical-aid-in-dying-is-authorized>
9. <https://medicalfuturist.com/technology-and-euthanasia/>
10. <https://www.mobihealthnews.com/news/emea/switzerland-permits-innovative-3d-printed-capsule-assisted-suicide>
11. <https://medium.com/illumination/technology-and-active-euthanasia-what-do-we-need-to-know-5a4525d0f48f>
12. <https://www.testbig.com/pteacademic-essays/medical-technology-can-increase-humans-life-expectancy-it-blessing-or-curse>
13. <https://www.technologyreview.com/2022/10/13/1060945/artificial-intelligence-life-death-decisions-hard-choices/>
14. <https://www.technologyreview.com/2022/10/13/1060945/artificial-intelligence-life-death-decisions-hard-choices/>
15. <https://www.testbig.com/pteacademic-essays/medical-technology-can-increase-humans-life-expectancy-it-blessing-or-curse>
16. (1986) 88 BOMLR 589
17. 1994 SCC (3) 394
18. 1996 AIR 946

CHAPTER 15

COMPARISON OF PUBLIC SECTOR BANKS VERSUS PRIVATE SECTOR BANKS: IN THE INDIAN BANKING INDUSTRY

K. MUJAKAR & R. BALAKRISHNA

Lecturer in Commerce, PVKN GC(A), Chittoor

Abstract

Commercial banks play a crucial role in helping the public in the mobilization of savings. Here public sector banks and both private sector banks are actson a commercial basis as the name itself explains about it. The deposits of the public are collected from them and invested in other sources of income and make returns. As we know that we got nationalization of banks after the merging of banks the 19 banks were reduced to 12. And after liberalization, the number of private sector banks' role has increased. In the current scenario at the part of employment opportunities and services, the private sector was dominating the public sector banks. The private sector banks provide good services and also lead to good positions in rankings than private sector banks. In my study, I observed that the public sector banks are getting merged with other banks. But whereas this private sector banks expanding their branches and merging position of the private sector is very less. The RBI has also taken strict measures in controlling both commercial banks and implementing various rules and regulations in protecting banks and as well as customers. Apart from that there are a lot of hacking happening in these banks in recent times as the digitalization of banks has entered this current scenario.

Keywords: Commercial banks, Nationalization, Liberalization, Digitalization, RBI.

Introduction

Commercial banks have taken a lead role in supporting the public to mobilize their savings and for their savings, the banks are protecting their deposits and providing a rate of interest to the customers. As we know that nationalization of banks in 1969 is 14 and in 1980 is 6 banks. Finally, after merging the public sector banks it was reduced to number 12. And there are 22 private-sector banks. The banks are upgrading with new technologies day to day as per the recent trends. The RBI also acts asa watchdog. And the RBI also issues proper guidelines to banks and it also issues various guidelines for banks for the proper functioning of banks to protect the customers. And it also implemented digital e-rupee. The banks made it easy to customers to operate their transactions from anywhere to anywhere or by sitting from home itself. However, in this digitalization, hacking also affected as a virus to the banking industry. We are observing a lot of fraud happening. And also NPA increased in banks which affects the banks in the form of losses. Here the major problem that arises is that the bad debts and NPAs of the banking industry showed more impact on people. Before in public sector banks, the minimum balance is 500 but now at least rupees. 2000 to be maintained otherwise the account may become a minus amount and accounts become dormant. And there are various techniques like block-chain technology used by banks for protecting customers from hacking.

Objectives

The Objectives of The Study Are

1. To understand the concept of commercial banks in India
2. To know the comparison of public sector banks and private sector banks in India
3. To identify the problems of the banking industry in this comparison of banks
4. To provide solutions forthe banking industry in our banking industry.

Research Methodology

This study is based on secondary data and some part of primary data collected from some of the bank employees, and students orally and based on real-life experiences in banks. The data was collected from various sources like books, magazines, newspapers, journals, etc.

Concept of Commercial Banks

Public Sector Banks: Public sector banks at present there are 12 banks in India. And it has more than 50 percent of ownership in the hands of the government. As the public sector banks are enjoying the majority of shares in the

banking industry. And also have more accounts like a savings account, current account, term deposits, and fixed deposits, and it also provides loans to customers at a low rate of interest and it also provides a loan on gold, vehicles, etc. at the least rate of interest. According to the consolidated balance sheet of scheduled banks approximately there are 59.9 percent of the total assets of the scheduled commercial banks as of March 31, 2021. But when comes to the growth of public sector banks is very low when compared to the private sector banks. Most of the public sector banks are in villages and rural areas to focus on and support the rural people.

Private Sector Banks

Private sector banks also should follow the guidelines of RBI. It also renders the services to the customers. The growth of private sector banks is very high when compared to public sector banks. Private sector banks generally have more competitive services and interest rates. Private sector banks mostly focus on profits and increasing the shareholder's value. And these private sector banks more focus on urban areas only where the urban population is and where the more factories and business sectors etc. the private sector banks also accept deposits from the customers same as the private sector banks. But there may be differences between serving the customers, interest rates, providing loans, loans, and innovative apps. After the post-liberalization, the private sector banks have increased more and dominated the public sector banks in the case of deposits, accounts, customers, etc.

Comparison of Public Sector Banks Vs. Private Sector Banks

1. Private sector banks don't focus on financial inclusion and support the public or customers. Whereas private sector banks focus on profits.
2. The minimum savings account of public sector banks for initial deposits should be a minimum of 500. Whereas in private sector banks, the initial deposit is Rupees. 10,000.
3. The public sector banks provide loans at a low rate of interest. The many self-help group accounts are mostly in public sector banks. And many accounts like govt. pensions, LIC, security benefits, and govt. loans are done through public sector banks. The govt. transactions mostly happen in public sector banks and also the customer can get subsidies from it. Whereas private sector banks have very less chances.
4. The share of public sector banks is approximately 70 percent and other banks' share is 30 percent.
5. The employee benefits and job security benefits are more in public sector banks and in private sector banks there is no job security. And job security mostly depends on the performance of the employees.
6. Pension benefits are available to employees of public sector banks and no pension benefits to private sector banks promotions are based on seniority in public sector banks and private sector banks' promotion is only based on merit and seniority cases are very less.
7. The customer base is more in public sector banks and less in private sector banks.

Problems of the Banking Industry in India

Public Sector Banks

1. **Generalization of Banks:** Anyone can do a job in public sector banks. There are no proper qualifications are maintained in these banks. Those who qualified for the bank exam can enter into a bank job and observe that SBI POs or other private sector banks which are keeping not the subject-related questions of banks or particular commerce people are not doing jobs in the banking industry. Say for example in preliminary exams; due to that he can't handle and is unable to know the activities of banks just he has the trained knowledge. And it selects the people only based on the passing of the examinations and passed of all the tests
2. **Lack of Competition:** due to no or fewer quality services in the public sector banks the customers are more diverted to private sector banks. And the private sector banks have more competition from them. The reason is that why the banking ranks are very less due to that there are no proper rewards for them. Whereas in the private sector banks motivate employees by providing benefits to them. Lack of maintenance in human resources management in public sector banks.
3. **More Bad Debts:** The public sector banks give more loans to the high people and no support to the farmers. (farmers have a lot of formalities to acquire the loan), so, that heavy bad debts and NPAs in the public sector banks.

4. **Social Burden:** The execution of government schemes fails mainly public sector banks.
5. **Functioning of Public Sector Banks:** The functioning of public sector banks seems copied from the private sector banks.
6. **Political Pressure:** There is more political pressure on the public sector banks. Mostly the heads of public banks are often chosen by the government.
7. No proper information was given to customers like any inquiry about the customer's loan and its interest amount, like credit card information, etc. and all activities with the late process and the maintenance of balance are very high if not maintained it leads to dormant or minus accounts and more hacking and fraudsters are happening and even crimes are happening the public sector banks doesn't have any proper grievances cell for customers and high rate of transactions in banks;
8. In practice most of the public sector banks in rural areas are very less. And no idea about the expansion of branches
9. Old apps and no standardization of apps and lack of innovation in public sector banks. And still, they are following the traditional methods for account opening process and KYC process but private sector banks only with

Private Sector Banks

1. High rate of transaction charges collected from customers
2. The private sector banks won't focus on financial inclusion
3. The private sector banks' initial deposit amount is very high
4. The private sector banks concentrate on more profits and more branches in urban areas where the population is large.
5. More pressure from regulatory authorities
6. No job security benefits to the private sector bank employees like pension and salary and rewards are any benefits given based on the employee performance only. There is no stable job guarantee in private sector banks.
7. No proper guidance to customers in private sector banks.

Recommendations and Conclusions

1. Improve work productivity
2. Improve customer service and establishment of banks in rural areas also.
3. Improving trust and confidence in customers
4. Improving NPA management
5. Improving the norms of priority sector lending
6. Improving corporate governance
7. Placing inspection rating by banks by RBI in its domain
8. Making bank auditors more accountable
9. Eliminating political interference in the functioning of banks totally
10. Proper grievances cell, in case of any complaint received from customers like hacking or any bank-related problems the bank should solve the process quickly.
11. Proper standardization of apps and introduction of innovative apps
12. Protection from hacking and cybercrimes a proper technology to be developed
13. Quality of service to customers
14. Expansion of branches by the public sector banks and providing more employment opportunities in public sector banks
15. In the selection process of fresh employees, the public sector banks should plan and conduct proper examinations and should take employees according to their qualification
16. Conduction of proper awareness program on customers and proper guidance to them

References

1. <https://www.youthkiawaaz.com/2018/06/rising-frauds-npas-in-indian-banks-specially-psbs/>
2. <https://www.moneylife.in/article/10-steps-to-turn-public-sector-banks-around-without-needing-bailouts/39809.html>
3. <https://byjus.com/commerce/difference-between-public-and-private-sector/>
4. <https://www.indifi.com/blog/private-bank-vs-public-sector-banks/>
5. <https://techykhushi.medium.com/public-sector-bank-vs-private-sector-bank-difference-between-public-sector-vs-private-sector-bank-45a6093b3072>
6. <https://keydifferences.com/difference-between-public-and-private-sector-banks.html>

CHAPTER 16

ELT AT TERTIARY LEVEL - IMPLICATIONS FOR CURRICULUM DEVELOPMENT AND PEDAGOGY

Dr. T. T. PRASAD MOHAN BABU

*Lecturer in English, Govt. Degree College for Women
Madanapalle, Annamayya Dist.*

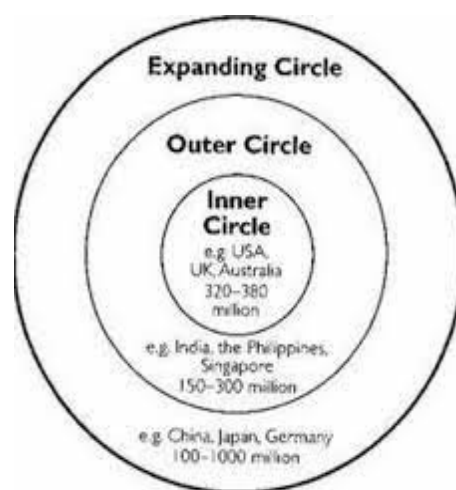
English has been taught as a second language in the pan-Indian context. The language which has been considered as a link language, associate official language and library language is also used as the language for lingua franca communication in the multilingual, pluralistic environment in India.

All these have their own implications for curriculum development and classroom pedagogy. This paper attempts to look at the issues involved in teaching English at the tertiary level (i.e., in the 10 + 2 + 3 scheme of Education). The paper also focuses on the existing scenario in terms of the teacher-learner profiles, the linguistic background and the approaches to English language learning and teaching. All the issues related are addressed in the light of the paradigm shifts in teaching and learning; to mention a few, the shift from teacher centredness to learner centredness and now to learning centredness; from behaviorism to looking at language learning as a cognitive process wherein the learner will have to apply a few strategies of learning acquired over a period of time notwithstanding the dichotomy between learning and acquisition.

The spread of English language

Kachru's (1986) notion of world English has given us a hint on the spread of English language in the global village. Kachru's model has pluralized the English language by showing the rule-governed nature of the new varieties that have emerged in post colonial communities. The spread of English is in three concentric circles as shown by:

The new social and technological forces unleashed by the form of globalization have generated a new relationship between communities. Diaspora groups, the internet, transnational production and economic relationships and expression of time and space through travel, media and communication account for what is called post modern globalization (Hall, 1997). This social context is marked by traits that differ from center periphery stratification that accompanied globalization and have been with us until recently in what Hall calls modernist globalization. This has led to the emergence of a new social context. The new social context can be further described thus.



The interaction between communities in multi lateral i.e., international involvement at diverse level is needed in today's economic and production enterprises.

National boundaries have become porous as people, goods and ideas flow across borders.

Language communities and cultures have become hybrid shaped by their fluid flow of social and economic relationships. Expanding and outer circle communities are developing new norms and they use English for lingua franca communication. When speakers in the outer circle and expanding circle speak to each other they are able to negotiate their differences on their own terms and accomplish their communicative needs effectively developing new norms. The search is still on for lingua franca core a possible grammar that does not belong to any national variety but one that facilitates communication when speakers step outside their communities.

English is a heterogeneous language with multiple norms-each norm coming into play at different levels of social interaction. While lingua franca norms come into play in multilingual context, the local norm may have to be used in clearly demarcated contexts of inner circle or outer circle usage. In extremely formal institutional contexts where inner circle norms are conventional one has to adopt the established norms. Proficiency in the postmodern globalization

requires the ability to negotiate this variability. The need of the hour is to address the fact that there are different norms that come into play at different levels of social interaction.

English having become the global language, the objectives of learning and teaching of English have become all the more different and the focus has become very specific i.e., to develop the ability to construct and extract meaning; the ability to construct and extract knowledge in English. In other words the ability to become proficient in using the language. It is not at just at the level of skill getting but it is also at the level of skill using and thus the ability to encode or decode meaning appropriate to the appropriate situations. The objective has thus become the development of the ability to understand the functional aspect of language. Thus the emphasis on learning the functions of language. i.e., the communicative purpose for which language is used. For example, the ability to acquire and use the language for expressing day-to-day needs, such as making a request, expressing a suggestion, expressing agreement and disagreement, interrupting a conversation or a dialogue, greeting, Introducing, welcoming, thanking, seeking and giving information, initiating a dialogue, ending dialogue, expressing opinion and so on and all these in both formal and informal situations. The need then is to acquire the 'forms' of language to express these functions and use them appropriately in meaningful contexts.

Learners at the tertiary level need the language for performing higher level functions and thus they need to equip themselves with the acquisition of appropriate language skills to facilitate effective and meaningful communication and understanding of the content in English. Communication having become the 'core' of language use the learners at any level must also acquire the ability to fine-tune' the language acquired both in the oral and written medium. Language being a means of discourse, the learners at different levels may require those skills and aspects of language appropriate to take part in different discourse kinds such as narrating, describing, arguing, expressing cause and effect relations and so on. The language to be acquired thus will be 'need-based' to cater to the differing language use events/environments. Thus the objective, to use the term coined by 'Dell Hymes' is to become communicatively competent i.e., to acquire linguistic competence, grammatical competence, sociolinguistic competence and strategic competence which constitute communicative competence.

When the objectives of teaching and learning have become so clearly defined, what ails our learners in realizing these objectives. This takes us to the next issue - Who is our learner?

The System Profile

The word System is used to refer to all that forms a part of a teaching learning situation at the tertiary level. This includes the learner, the teacher the curriculum, pedagogy and so on.

English Language learners at the tertiary level are invariably from differing socio-economic, academic linguistic backgrounds and are differently abled with differing levels of motivation, need achievement, differing learning styles and 'needs' Needless to mention the demographic differences among them, the influence of mother tongue, besides poor acquisition - rich environment and the lack of awareness on the part of the learners of the need to become proficient users/competent users of the target language. Besides these, the learner at this level require language competence to comprehend what is being transacted in the class (i.e., understanding the lectures through listening) and read in English for knowledge construction and later express through speaking and writing wherein the learner is also required to acquire higher academic skills such as note-making, extracting, writing abstracts, summaries and transcoding the content. The learner at the tertiary level is deemed to have formally learnt the English language at least for a period of ten years before entering the said level.

The ability to negotiate English in diverse transnational contexts in postmodern communication requires us to move beyond proficiency in single varieties of English and to develop broader competencies that enable students to deal with these needs. The competencies to be developed in the learners then will include language awareness, sociolinguistic sensitivity and negotiation skills

The learners will have to realize that there are well-established pragmatic conventions for English 'communication. They will have to be aware of dialect differences, identity considerations, contextual constraints and cultural sensitivity. The need of the hour is thus to devise more interactive and collaborative pedagogical formats for developing one's proficiency in strategies of language negotiation.

In the light of the above, the teacher's responsibilities in the class, besides transacting the content include equipping the learners with a set of techniques and skills required for realizing the objectives of learning the language and for realizing the goals set before them. The teacher at this level hence needs to equip himself/herself with the necessary skills to successfully transact so as to cater to the needs of the learners.

The paradigm shift from learner centredness to learning centredness, focuses not on the product of learning but on the processes of learning and it has changed the role of the teacher from that of knowledge giver or dispenser of knowledge to that of a facilitator and a change agent. In this role, the teacher needs to understand the differing inherent styles of learning of the learner(s) and the 'schema' that each one has. In the absence of any such conscious application or employment of the schema or strategies, there is a need on the part of the teacher to formally train the learners in the use of well tried out and frequently used learning strategies.

For years the language teaching scenario at the secondary level has been dominated by the SOS approach. The early 1980's-1990's witnessed the change from the behaviorist centred approach to cognitive approach, which views language learning as a process. That has been reflected in the CLT, which as an approach focuses on developing the ability to convey meaning. In other words the focus has been on the functions of language and not on the 'forms' of language and thus the shift from the use of graded materials to those materials which look at language as a whole'.

Achieving these will be possible only through a curriculum (The term curriculum is used here to refer to syllabus), which is learner centred, need based and causes learning to occur. In the recent years there has been an increasing argument among syllabus planners, teachers and learners that English language courses should incorporate in them learners' future language needs into them. The learner needs in the changing scenario are diverse in nature. The skills required, for instance, include effective communicative abilities to realise the objectives of communication both at the prospective work place(s) and at social environments. Further with the advent of globalization and technology driven life style the purpose of acquiring need based skills has become all the more important. E.g. negotiation strategies.

A need based curriculum thus will be holistic and will focus on the development of language through a content (across different discipline and genres) and attempt skills development in an integrated mode. Also, in other words, it will attempt to impart by including in it content from the specific discipline and from the general. A need based curriculum will equally emphasize on cognitive functions and language/communicative functions which relate to the day to day practical academic needs of students at the said level. A learner then will have an exposure to content materials (subject specific) and process materials. Content materials will chiefly serve as sources of data in information. The main purpose of content materials will be to serve as a means for the process of learning. Process materials, on the other hand, will serve as guidelines or framework for the learner use of communicative knowledge and abilities. Their main role will be initially to organize and facilitate the learner's process competence in relation to any particular content.

Mianoona (1992) has outlined three broad approaches to course design.

These are language centred, skill centred, learning centred which is all-inclusive, focusing on both the academic and specific needs of the learner, and it provides context for cooperative negotiation, joint interpretation and sharing of expressions.

Problem posing approach to language curriculum

This approach involves many steps. The first step in this approach is to identify topics of concern to students. The concerns are then presented to students through visual or linguistic input: a picture, dialogue, or other text types. Criteria used for selection of this input are that it depicts a situation that students can easily recognize, and that it poses a problem with several possible solutions. The text or visual should not provide solutions so that a discussion of the problem will encourage students to think of options and possibilities. The problems that are posed should not be overwhelming or unsolvable, and the presentation of the problem should be sensitive to local culture and beliefs, so that students can consider steps they might take to address or resolve the problem.

Teachers encourage discussion of the text or visual through questions, which lead students to describe the situation, identify the problem, relate the problem to their own experience, analyse the cause of the problem, and seek solutions. Through this question and answer dialogue, students generate vocabulary and use structures that the teacher

later draws on to develop a series of exercises, practice opportunities, and application activities, which make up the rest of an instructional unit. The posing and discussion of problems provides teachers who have few materials with a focus on content and language structures that they can exploit in a series of language teaching lessons following the problem-posing sessions. This process enables teachers to renew and supplement curriculum outlines with language activities that develop students' English language skills as they address interesting and meaningful Issues.

Since language learning in a problem - posing design evolves out of an issue that is relevant to students' lives, it has the advantage of being highly motivating and providing a purposefulness to language-learning activities. Students learn to say in English what they really want to say, and structures can be acquired in the order students need them for authentic discourse creation/ construction. Problem - posing allows for affective responses while building the language, critical thinking, and life skills students need, and providing them with opportunities to practice and apply those skills.

The learner at the tertiary level requires both communication skills and language skills required for performing specific purposes. When language is taught or learnt for specific purposes, the curriculum for the same should include activities, which focus on practical skills, and activities that will help in preparing learners perform macro tasks directly relevant to their prospective vocation. In short, that curriculum should aim at developing the ability to perform and acquire skills at the micro and macro levels.

Example: Making an oral presentation to secure a technical project.

The learner will have to take part in different discourse type and use language meaningfully in recurring situations. This implies grammar based approach to course design or a function based course design may not be able to facilitate the fulfillment of the academic /language needs.

Illustration

Specific needs (cognitive and linguistic) of the students of science acquiring, recalling and confirming facts, delineating scientific concepts, principles or theoretical models identifying problems solving concrete problems by applying in scientific context making or testing hypothesis or specification identifying or describing or recording observation interpreting, observed or recorded data inferring from observed or recorded data

When needs being so specific for students of different disciplines language teaching will not be found interesting or useful in an inclusive classroom for the simple reason that at the tertiary level there are learners who belong to different discipline in one situation. The existing course materials do not seem to be catering to the needs of an inclusive class. Hence, an argument is made for a design, which is learner centred, interesting and need based. A content unit of such a design will focus on development of the language skills besides creative thinking and relative cognitive skills for better performance and acquiring language competence. A content unit of such a design will resemble thus.

Text for reading (preferably theme based)

Comprehension activities (differing levels) Discussion (on an issue-related to the reading content) through

- Dialogue
- Debate, Inquiry, Enquiry, Reference
- Presentation

Writing

Academic writing with grammar and language functions in- built, note making, note taking and reports.

Note: The text suggested may be across different disciplines and genres. The text may be either visual or printed. Literary text can also be one such kind. The issue may emerge through whole class observation or discussion.

Such a design it is hoped will not only develop the higher academic skills of the learner but also give the learners an exposure to different language varieties in relation to differing themes and topics in terms of different text, types and genres.

The classroom pedagogy suggested in this paper is thus a task based approach to language teaching in which the learners will use the language in their repertoire to solve the problem that the task carries and incidentally acquire new elements of language.

References

1. Barnes. D, From Communication to Curriculum Harmondsworth, Penguin, 1976
2. Brumfit. C and Carter. R: Literature and Language Teaching Oxford, Oxford University Press 1986.
3. Brumfit: Communicative Methodology in Language Teaching, Cambridge University Press, 1984
4. Ellis G and Sinclair.B: Learning to Learn English, Cambridge University Press, Cambridge, 1989
5. Johnson.K. and Marrow. K. (eds): Communication in the Classroom, Harlow, Longman, 1981
6. Mr. Legutke Michael and Haward Thomas : Process and Experience in the Language Classroom London, Longman, 1991
7. Prabhu N : Second Language Pedagogy, Oxford, Oxford University, Press, 1897
8. Stewick. E: Teaching Language, a Way and Ways, Newbury House, 1980.

CHAPTER 17

IMAGE AND VIDEO RECOGNITION BY USING MACHINE LEARNING

MAHABOOB BASHA

Department of Data Science
SVCET College, Chittoor, A.P

Abstract

The field of image and video recognition has witnessed significant advancements with the adoption of machine learning techniques. In recent years, deep neural networks, specifically convolutional neural networks (CNNs), have achieved remarkable performance on various recognition tasks, such as image classification, object detection, and human pose estimation. This paper presents a review of several research papers that showcase the success of machine learning-based approaches in image and video recognition. The reviewed papers cover topics ranging from the architecture design of CNNs, large-scale visual recognition challenges, to the application of deep neural networks in specific recognition tasks. The results highlight the effectiveness of deep learning in addressing the challenges of recognizing visual content in a wide range of real-world scenarios. These advances have opened up new avenues for solving complex recognition problems in various fields, including autonomous vehicles, robotics, healthcare, and security.

Introduction

Image and video recognition have become increasingly important in various fields, including computer vision, multimedia, and artificial intelligence. With the advancement of machine learning techniques, image and video recognition systems can now achieve remarkable accuracy and efficiency in identifying and analyzing visual data.

This research paper aims to provide an overview of the current state-of-the-art in image and video recognition by using machine learning techniques. We will explore the fundamental principles and techniques of machine learning, including deep learning and Neural Networks that have been used in image and video recognition systems. We will discuss the challenges and limitations of these techniques, including issues related to data preprocessing, training, and evaluation.

The insights obtained from this research paper can help researchers, practitioners, and developers in understanding the current state-of-the-art in image and video recognition using machine learning techniques. We will also identify potential areas for future research and development, including the integration of machine learning with other technologies such as robotics and augmented reality. Overall, this research paper seeks to provide a comprehensive understanding of the current trends and challenges in image and video recognition by using machine learning.

Applications

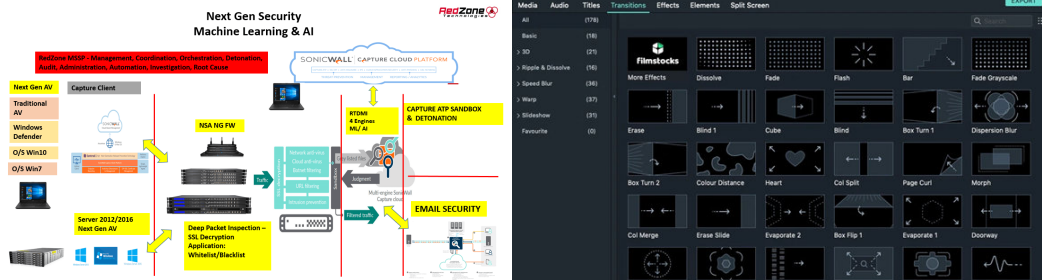
The application of image and video recognition using machine learning is wide-ranging and has the potential to impact many industries. In this research paper, we will explore some of the key applications of this technology.

One important application of image and video recognition is in the field of healthcare. Machine learning models can be trained to identify and classify medical images, such as X-rays and MRIs, to assist medical professionals in making diagnoses. Additionally, image recognition can be used to monitor patient behavior and provide early warnings of potential health issues.

Another application is in the field of transportation. Machine learning models can be used to analyze images and videos from traffic cameras to improve traffic flow and safety. They can also be used to detect and track objects on the road, such as pedestrians, vehicles, and bicycles, to prevent accidents.



Security is another area where image and video recognition using machine learning can be beneficial. For example, facial recognition technology can be used to identify and track individuals in surveillance footage, aiding law enforcement in investigations. It can also be used to improve security at airports and other public places.



The entertainment industry is also beginning to adopt image and video recognition technology. For example, machine learning models can be used to automatically generate movie and TV show recommendations based on a user's viewing history. They can also be used to improve video editing and special effects.

Finally, image and video recognition using machine learning has the potential to be used in many other applications, such as agriculture, retail, and manufacturing. In agriculture, it can be used to monitor crop health and identify pests. In retail, it can be used to improve inventory management and personalize customer experiences. In manufacturing, it can be used to monitor production lines and identify defects.

Overall, the potential applications of image and video recognition using machine learning are vast, and this technology has the potential to revolutionize many industries. With continued research and development, we can expect to see even more innovative applications emerge in the coming years.

Challenges

While image and video recognition using machine learning is a promising technology with many potential applications, there are also several challenges and limitations that need to be addressed. In this research paper, we will explore some of the key problems associated with this technology.

One of the main challenges is the availability and quality of training data. Machine learning models rely heavily on large datasets to learn patterns and make accurate predictions. However, collecting and annotating large amounts of data can be time-consuming and expensive. Additionally, the quality of the data can have a significant impact on the performance of the models. Noisy or biased data can lead to inaccurate or unreliable predictions.

Another challenge is the issue of overfitting. Machine learning models can sometimes become too complex and fit too closely to the training data, leading to poor performance on new, unseen data. Regularization techniques, such as dropout and weight decay, can help prevent overfitting, but finding the right balance between model complexity and generalization is still a challenge.

Evaluation metrics for image and video recognition models can also be a problem. Traditional metrics, such as accuracy and precision, do not always reflect the real-world performance of the models. For example, a model may have high accuracy but perform poorly on rare or important cases. Additionally, there is a lack of standardized evaluation metrics for some applications, making it difficult to compare different models and approaches.

Privacy and ethical concerns are also a significant issue in image and video recognition using machine learning. Facial recognition technology, in particular, has raised concerns about the potential for abuse and discrimination. There are also concerns about the collection and use of personal data, particularly in applications such as surveillance and security.

Finally, the interpretability of machine learning models can be a problem. Deep learning models, in particular, can be difficult to interpret and understand, making it challenging to diagnose and fix errors or biases. Explainable AI (XAI) techniques, such as attention mechanisms and feature visualization, are emerging as potential solutions to this problem.

Overall, while image and video recognition using machine learning has many potential benefits, there are also several challenges and limitations that need to be addressed to ensure that this technology is used ethically and effectively.

Addressing the Challenges (Solutions)

To address the challenges and limitations associated with image and video recognition using machine learning, there are several solutions that researchers and practitioners are exploring. In this research paper, we will discuss some of the key solutions to these challenges.

To address the challenge of data availability and quality, researchers are exploring new techniques for data augmentation and transfer learning. Data augmentation involves creating new training examples by applying transformations, such as rotations or flips, to existing data. Transfer learning involves using pre-trained models on large datasets, such as ImageNet, to initialize models for new tasks. Both techniques can reduce the amount of data needed for training and improve model performance.

To address the issue of overfitting, researchers are exploring techniques such as dropout, weight decay, and early stopping. Dropout involves randomly dropping out nodes in the neural network during training to prevent over-reliance on individual features. Weight decay involves adding a regularization term to the loss function to encourage smaller weights and simpler models. Early stopping involves stopping training when the model's performance on a validation set starts to decrease, to prevent overfitting.

To address the problem of evaluation metrics, researchers are developing new metrics that better reflect the real-world performance of models. For example, precision-recall curves and receiver operating characteristic (ROC) curves can provide more detailed information about a model's performance on different subsets of the data. Additionally, researchers are working to establish standardized evaluation benchmarks for different applications, to facilitate fair comparisons between models and approaches.

To address the privacy and ethical concerns, researchers and practitioners are exploring techniques such as differential privacy and federated learning. Differential privacy involves adding noise to the training data or model parameters to prevent the disclosure of sensitive information. Federated learning involves training models on distributed devices or servers, without sharing the data itself, to protect user privacy.

Finally, to address the problem of interpretability, researchers are exploring techniques such as attention mechanisms and feature visualization. Attention mechanisms can help highlight important regions of an image or video that the model is using to make predictions. Feature visualization can help visualize the patterns and features that a model has learned during training, to aid in debugging and diagnosis.

Overall, there are many solutions being explored to address the challenges and limitations associated with image and video recognition using machine learning. Continued research and development in these areas will be essential to ensure that this technology is used ethically and effectively.

Conclusion

In conclusion, image and video recognition using machine learning is a rapidly evolving technology with many potential applications. However, there are also several challenges and limitations that need to be addressed, including the availability and quality of training data, overfitting, evaluation metrics, privacy and ethical concerns, and interpretability.

Fortunately, researchers and practitioners are actively working to address these challenges through new techniques and solutions, such as data augmentation, transfer learning, regularization, differential privacy, and attention mechanisms. Continued research and development in these areas will be essential to ensure that this technology is used ethically and effectively, and that it can contribute to positive outcomes in areas such as healthcare, security, and entertainment.

Despite these challenges, image and video recognition using machine learning is an exciting and promising technology that has already demonstrated impressive performance on many tasks. With continued research and development, it has the potential to revolutionize many industries and improve the quality of life for people around the world.

References

1. K. Simonyan and A. Zisserman, "Very Deep Convolutional Networks for Large-Scale Image Recognition," arXiv preprint arXiv:1409.1556, 2014.
2. A. Krizhevsky, I. Sutskever, and G. E. Hinton, "ImageNet Classification with Deep Convolutional Neural Networks," *Advances in neural information processing systems*, vol. 25, pp. 1097-1105, 2012.
3. O. Russakovsky et al., "ImageNet Large Scale Visual Recognition Challenge," *International Journal of Computer Vision*, vol. 115, no. 3, pp. 211-252, 2015.
4. J. Donahue et al., "Long-term Recurrent Convolutional Networks for Visual Recognition and Description," *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, pp. 2625-2634, 2015.
5. C. Szegedy et al., "Going Deeper with Convolutions," *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, pp. 1-9, 2015.
6. K. He, X. Zhang, S. Ren, and J. Sun, "Deep Residual Learning for Image Recognition," *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, pp. 770-778, 2016.
7. R. Girshick, J. Donahue, T. Darrell, and J. Malik, "Rich Feature Hierarchies for Accurate Object Detection and Semantic Segmentation," *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, pp. 580-587, 2014.
8. A. Toshev and C. Szegedy, "DeepPose: Human Pose Estimation via Deep Neural Networks," *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, pp. 1653-1660, 2014.
9. L. Wang et al., "Learning Fine-Grained Image Similarity with Deep Ranking," *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, pp. 1386-1393, 2014.
10. Y. Jia et al., "Caffe: Convolutional Architecture for Fast Feature Embedding," *Proceedings of the ACM International Conference on Multimedia*, pp. 675-678, 2014.

CHAPTER 18

ENVIRONMENTAL CONCERNS IN THE SELECT SHORT STORIES OF RUSKIN BOND

Dr. S.V. RAMESH KUMAR

Lecturer in English, Govt. Degree College, Pakala
Tirupati District, A.P

Abstract

Ruskin Bond is one of the most popular short story writers of Indian English Literature. He has spent most of his life at the foot hills of Himalayan Mountains. He is a keen observer of nature and has great concern for nature, life and culture of Himalayan region. Mountains, Hills, forests, trees, rivers of Himalayan region are an important part of his stories. They are famous for depicting beauties of nature and human attachment with it. Most of his stories give an underlying message to the readers to save nature. Bond uses his short stories as an educational tool to develop environmental concerns and sense of duty among his readers. The present paper discusses the environmental concerns of Ruskin Bond with special reference to his select short stories viz. The Cherry Tree, Death of the Trees and Mother Hill.

Keywords: Nature stories-Environmental concerns-save nature-sense of duty-sensibility and obligation.

Ruskin Bond is an Indian English writer of British descent. Now he lives at Landour, Mussoorie, India. His novel *Our Trees Still Grow in Dehra*, got Sahitya Academy Award in 1992. He got Padma Shri in 1999 and the Padma Bhushan in 2014.

During his literary career of more than 50 years, Ruskin Bond experimented with different genre of fiction like short stories, Novels and Novella. He also tried his hand at non-fiction like essays. Some of his works are autobiographical and some of them are meant for children. The Indian Council for Child Education (ICCE) has recognized his contribution for the growth children's literature in India. Most of his works are influenced by his own experiences at the foothills of the Himalayas like Dehra, Mussoorie, where he spent large part of his life.

Ruskin Bond's short stories reflect his concern for the destruction of the environment and his sensitivity towards nature. He writes about his attachment with the environment, people and life of Himalayan region. In his stories we find characters living, struggling and achieving in the very natural setting of Dehra. Through his stories we can understand writer's attachment with the hills, mountains, streams, rivers, trees, birds and animals of this region. Thus love for nature and environment, concern for their protection are important themes of his works. This is very much evident in the selected stories *The Cherry Tree*, *Death of the Trees* and *Mother Hill*.

The Cherry Tree

The Cherry Tree is an interesting story about six years old boy, who lives with his grandfather on the outskirts of the Mussoorie. One day while returning from school Rakesh buys cherries. On the way he eats them and when he reaches home he offers one to his grandfather. His grandfather inspires Rakesh to plant the last seed. He goes to a corner of their garden and presses the seed into the wet soil with his thumb. Grandfather advises Rakesh to water it regularly so that it can grow fast.

When Rakesh is nine – and the tree is four, but almost as tall as Rakesh. Next year there are blossoms and the tree is taller than Rakesh, which is less than half of his age. The cherry tree has now become an abode for many bees and birds. During summer Grandfather likes to rest under the Cherry tree. When Rakesh asked his grandfather about why they like that particular tree so much, when there are so many other trees in their garden. Grand father says, "We planted it ourselves" (30)

This story displays how easy it is to plant seeds and grow them into trees. It also gives a message about the uses of trees and brings out attachment with trees. If a tree grows, it provides not only fruits but also rest, fresh air and company. It also becomes abode for many birds and animals. In this story, Bond brings out that a tree grows even faster than humans and lives many more years than humans. Thus, Bond shows the superiority of trees over human beings. Through the story Bond motivates the young children to plant seeds and develop attachment with trees.

Death of the Trees

The title of the story 'Death of the Trees' brings out the fact of gradual death of environment due to selfishness of human beings. The story discusses Bond's concern for cutting of trees in the name of development. Here Bond is not against the development but he is against the development at the cost of environment. He feels bad when PWD decides to cut trees to build another new road to mountain. It gives great pain to Bond, when trees are falling down because they have been his companions for many years.

Bond treats the trees as his brothers and so mourns at their death. Bond ironically comments on humans who fail to understand the importance of trees. Bond expresses his concern for the birds which are forced for migration due to the felling of trees. He also shows concern about the disturbances created by the vehicles to the birds and animals. Bond believes that Nature is superior to Human beings and warns them not to harm Nature in the name of development. He suggests them to live in harmony with the Nature.

Mother Hill

In the story 'Mother Hill' Bond expresses his concern for Himalayan hills. Here he compares mountains with human beings. He felt that, Humans do not remain forever but mountains are permanent. Bond likes Himalayan Mountains very much because they are permanent. They are so stubborn even if humans blast holes in them for minerals or make tunnels for transportation, they decline to move. Bond ironically remarks that in spite of all these destructive activities, humans cannot easily get rid of mountains.

Bond has great bonding with the trees, hills and mountains due to his lifelong living among hills and mountains. He says, "Yesterday at twilight, when I passed beneath a canopy of oak leaves, I felt that I was a part of the forest. I put out my hand and touched the bark of an old tree, and as I turned away, its leaves brushed against my face as if to acknowledge me". (11)

In this story Bond also expresses his concern about deforestation and gradual extinction of animal population. He warns if humans continue to trouble and destroy them, one day they become extinct. "One day, I thought, if we trouble these great creatures too much, and hack away at them and destroy their young, they will simply uproot themselves and march away, whole forests on the move, over the next range and next, far from the haunts of man. I have seen many forests and green places dwindle and disappear. Now there is an outcry. It is suddenly fashionable to be an environmentalist. That's all right. Perhaps, it is not too late to save the little is left". (11)

Conclusion

From the above discussion it can be concluded that, the soul of Ruskin Bond's works is nature. He celebrates nature and sensitizes his readers about the threats to the environment caused by industrialization, urbanization and commercialization. In an Interview with Amita Aggarwal, he says, "Problems of deforestation, pollution, and environmental decay of wildlife have been the subject matter of most of my stories and essays." (57).

Bond's admirer and friend Dilip Bobb says; "Sitting at his desk in Ivy Cottage . . . precariously perched on a spur in the hills of Mussoorie, Ruskin Bond looks out from his window and sees and hears things we have blind and deaf to". (249).

Ruskin Bond uses literature as a tool to discuss environmental issues and create awareness regarding. It would not be an exaggeration if it is stated that Ruskin Bond's short stories have profound environmental concerns and they suggest for its protection. Henny Vaughan justifies this through his statement:

"A delicate atmosphere of serene beauty enables his readers to enjoy the rhythm of life and nature reverberating and recapitulating a heaven of freedom in his works". (Vaughan 69).

References

1. Aggarwal, Amita. *The Fictional World of Ruskin Bond*. Sarup & Sons. New Delhi.2005.Print.
2. Bobb, Dilip. "Natural Bond", *The Creative Contours of Ruskin Bond*, (ed.) P.K. Singh (New Delhi: Pencraft Pub.) 1995.Print
3. Bond, Ruskin. "The Cherry Tree".*Collected Fiction*.New Delhi: Penguin -India Ltd.1999.Print.
4. ---"Death of the Tree".*Collected Fiction*. New Delhi: Penguin -India Ltd.1999.Print.
5. ---"Mother Hill". *Himalayan Tales*. New Delhi: Rupa & Co. 2005.Print.
6. Vaughan, Henny. "The Retreat", *The Golden Treasury*. Calcutta: OV.P.1983.Print

CHAPTER 19

GOOD LITERATURE IS A GOOD BRICK FOR CHARACTER BUILDING EDUCATION

Dr. M.V. SULOCHANA

Lecturer in English

Govt. Degree College, Porumamilla, Kadapa District

Good Literature is defined as the message that results in the blossoming of the human qualities talented every human being. It helps every person to grow into a Physically, Mentally and Spirituality, Healthy one. But the present day Education develops the intellect and skills but does little to develop good qualities which can be full filled by reading good literature only. So it is said that good literature helps to broaden one's outlook and make him useful to society and the world at large.

Today's Education is Knocking off the 'S' from 'Skill' with the result that the Knowledge is 'Killed' with disastrous result for mankind due to lacking of Human values in Character building. In the 19th and 20th Centuries man felt that science had the answers to everything so faith in God and Spirituality took a nose-drive. The result is the chaotic world that we have today. But again in this 20th Century Human being have been rediscovering the importance of value based Education which can be acquired only through the study of good Literature. The WHO (World Health Organization) defines health as a state of Physical Mental and Spiritual wellbeing. So for this development of good health 'Good Literature Study' is a very essential vitamin needed to the present day generation.

Good Literature is nothing but which develop the values like Truthfulness, Kindness, Honesty, Law Justice and Patriotism etc. The study of Literature in the form of Short Stories, Poems, Fables and Novels forces students to imbibe moral values in their day today of life. The every short and simple poems of Yogi Vemana with heavy moral content enlightens the students at an early age. So poetry plays a dual role in our lives besides satisfying our aesthetic pleasure and awaking our senses to correct choices in our character building. Films are visual representations of Literature. They give life and action to the television, the radio and even the internet contain Literature.

Literature is as already manifested in the earlier Human civilization even before the invention of words and language. Carvings and Paintings on walls inside caves of stone give evidence about the pre Historic people's way of life. It is the foundation of Humanity's cultures, beliefs and traditions. Everything that happens in a Society can be written, recorded in and learned from a piece of Literature, so Literature is a foundation of a religion. The scripts of all religions explain the mysteries of life as well as setting rules for one's personal faith. So it is said that Literature is a foundation of religion.

Literature gives voice to the people to express their opinions in public. Not all revolutions have to be fought in blood. A good Literature writings can invoke people from their slumber to fight for Justice in the Society. So it is said that "Pen is mightier the Sword". For example at the time of freedom struggle in India Gandhiji awakened people through his writings in 'Young India' a notable magazine. Martin Luther a German monk's revolt against Roman Catholics Church's corruption divided Christian Church into two sectors, Catholicism and Protestantism.

Gandhiji once said "Knowledge without Character is a powerful evil". So for the development of good character good values must be incorporated in our Character. This task can be achieved through the study of good Literature. So the E.H.V (Education in Human Values) programme was made an integral part of the curriculum. Educational Institutions should teach students to adhere to truth and to discharge their duties as a sacred Obligation. So mouldings of Character must start with Children at the earliest age by developing human values from the primary school. Human values are not the things to be implanted from outside. They are present in every one. The teachers must provide stimulus and the encouragement to bring them out. Today the Educational system to ignored teaching Human values but in the Gurukulas of the past instruction was provided for right living Spiritual advancement, moral conduct and behavior. Every teacher must become Rishi or Sage who will lead the children along Material, Moral, Ethical and Spiritual paths until they become ideal citizens.

Ancient Period Education- Key Role in Character Building

Ethics and value education got equal priority in the education system of ancient India. They were integrated in teaching learning process in the belief that value systems will mould the development of character in the student. This pattern was followed during Vedic, Buddhist, Jaina and medieval times. However with the advent of British Education system, education system was transformed into a commercial activity. Present day society needs to revitalize its education sector by combining science into technology on equal footing with morals and ethics of its past to the outcome of good charactered citizens.

Main aim of education is the development of personality which means the development of character. But in Vedic period education is necessarily individual enterprise. It is an intimate relationship between teacher and the pupil which is inaugurated by a religious ceremony, 'upanayanam'. The education that is thus began is called by a significant term 'Brahmacharya'. It is not like the admission of a pupil to the register of a school by his payment of the prescribed fee. The pupil must live with him as member of his family. The constant and intimate association between teacher and taught plays a pivotal role in the all round development of a pupil. The pupil belongs to the teacher and not to an institution called the school. The teacher acts as a role model, he imbibes the ideals and traditions of his society, which regulate his life from the outside unholy influences. The student feels that he is not lost in the crowd hence that grows in him a sense of personal worth and of placid individuality, mortality and also lays a foundation of spirituality.

The ancient schools were not detached buildings of brick and mortar like modern schools, they were centers of talent, culture which help to build good charactered personalities to radiate in all directions. Thus it can be stated that the ancient society had a sound education philosophy which was simultaneously practical, comprehensive and suited to the varying educational needs of the society. So India must carefully conserve and foster the particular type of personality or character. She has been building up through the ages by a corresponding system of education which produces the fruits of good literature to the society. Now a day's human relations are deteriorated because of commercialization. So rejuvenation of values involves rejuvenation of human relations which plays a crucial role in developing the good educationalists which has interlink to develop good literature to the world.

Literary/ literary works offer its readers with values, humanity and other issues that sometimes they do reflect things happening in real life. Therefore Lawernson & Swingewood (1971) called literature as a mirror of the age. So by reading literature students are exposed to many life stories present within the literature. Therefore good literature can be used as teaching material for character building education. O'Henry's short story "After Twenty Years" is a literary work utilized as a teaching material.

Now a days character building education is booming and to be socialized by the government Eg: Novels, short stories and poems etc. Students can educate themselves the character building through the short story by mentioning those learned characters, they can also show their self reflection after learning it. There is a possibility of using literature as prospective teaching material for character building is indeed a way of empowering good literature.

High-quality literary works are able to express the complexity and sophistication of human nature in the complex reality of life. Novels, romances, short stories, and epic stories of heroism are prolifically written, capable of displaying figures with an enchanting character. Literary works constructed with the expertise of aesthetic logic gives a thrilling and thrilling effect. This is the reason why literature plays an important role in the process of character education. In fact, character education strategies can be based on the search for wisdom and meaning from literary works.

As is known, the main purpose of character education is to grow a distinctive reason so that learners can digest that virtue differs diametrically with evil. By means of a distinguishing reason, character education creates consciousness, that there is a set of factors and a series of variables that cause the emergence of virtue and evil. Character education creates awareness among learners to understand that virtue or evil does not emerge from the vacuum, but is the logical consequence of various causes. Goodness or evil is formed through a long, complicated and tortuous process in the whole action-reaction of humans to the universe and the actions of human reactions with each other. It seems clear in this context, how real is not simple character education.

Why go through literature? When the education sector is considered only hunt and emphasize the academic realm alone, so ignore the moral issues and virtue if any delivery is tend to indoctrinatif and need a visionary breakthrough that can invite and internalize character education in accordance with the demands and dynamics of psychosocial development of learners. Literary works, presumably can be a strategic medium to realize that noble goal. Through literary works, children from an early age can do the feeling, if the mind, and exercise intensively so that children indirectly have positive behavior and habits through the process of appreciation and creative through literary works. From the description, the authors are interested to discuss how the integration of character education in literature learning so that literature can be used as media delivery of character education to learners.

Literature is seen as motivating material depicting real sense of life achievement and is considered to educate the whole person relating the value inside and outside the society. Besides they are more positive points that good literature can be empowered for the character building education. Lazer claimed that literature may also have a wider educational function in the classroom which can help for the stimulation of student imagination to develop their critical abilities and to increase their emotional awareness. So, literature is a perspective teaching material for educating the students. Character building depends on qualities embedded in the literature. So these good characted Bricks (Students) lay a foundation stone to the future structure building of 'MAHA BHARATH' i.e, "GREAT INDIA".

Good literature must end in wisdom through it may start delight to develop Human values among us. So good literature is a vital force for the development of positive and good attitudes to achieve high aims in our lifes. The power of literature affects all of us. Literature flourishes as long as world lives.

References

1. Cruz JHR (2010) The Role of literature and Culture in English Language Teaching.
2. Maley, A (2010) Literature in the Language Classroom, The Cambridge Guide to Teaching ESOL, Cambridge University press.
3. Lawperson D & Seingewood (1971) the sociology of literature London. Macgibbon & kee
4. Bhagavan Satya Saibaba: Premavahinisatyasai books and publication Trust Prasanthi Nilaya.
5. Sister Nivedita: Hints on National Education in India Udbodhan office, Calcutta.
6. Jales Henry: Essays on Education Penguin Books Limited, England.
7. Lazer G (1993) literature and language teaching. A Guide for Teachers and trainers Cambridge: Cambridge university press.

CHAPTER 20

SUCCESSFUL WOMEN ENTREPRENEURS: INDIA

Dr. P. JYOSHNA

Lecturer in Commerce PVKN GC (A), Chittoor

Abstract

Women entrepreneurs play a crucial role in the economic development of the country. They are filling the gaps and they are providing employment opportunities to the people. Now a day's women entrepreneurs are doing and making successful as male entrepreneurs. They are taking active part in supporting backward areas and however the women entrepreneurs facing many challenges in all aspects like investment, paucity of funds, marriage, effect from large scale entrepreneurs etc. However, most of entrepreneurs in the society they succeeded even many challenges they arise in their platform. Now they became a role model to future entrepreneurs also. The women entrepreneurs are not only limited to one field they are playing a leading role in all fields like aeronautics, engineering, mines, etc. The women entrepreneurs at present they are changing the society. They are contributing its role in establishment of enterprises, employment, innovative technology, improvement in backward areas, and improving GDP, National income.

Keywords: Employment, Engineering, GDP, Paucity of funds, Entrepreneurs.

Introduction

Entrepreneurship refers to the act of setting up a new business or reviving an existing business so as to take advantages from new opportunities. An entrepreneur is a person who starts an enterprise.. A number of definitions been given of an entrepreneur- The economists view him as a fourth factor of production along with land labour and capital. The sociologists feel that certain communities and cultures promote entrepreneurship like for example in India we say that Gujaratis and Sindhis are very enterprising. Still others feel that entrepreneurs are innovators who come up with new ideas for products, markets or techniques. Thus, entrepreneurs shape the economy by creating new wealth and new jobs and by inventing new products and services. However, an insight study reveals that it is not about making money, having the greatest ideas, knowing the best sales pitch, applying the best marketing strategy. It is in reality an attitude to create something new and an activity which creates value in the entire social eco-system.

Objectives

The Objectives of the Study are

1. To know about role of successful women entrepreneurs in India
2. To know the challenges of women entrepreneurs
3. To provide the suggestions which are the challenges faced by women entrepreneurs

Successful Women Entrepreneurs in India



1. Chitra Gurnani Daga, Co-Founder and CEO of Thrillophilia.com

Chitra graduated with her MBA in Strategy and Leadership at the Indian School of Business in 2011 and used her degree to successfully launch her own business. She had previously worked as a software engineer for Infosys and SAP Labs, but her love for travel inspired her to start her own travel-focused startup. Today, Thrillophilia is one of India's biggest travel booking platforms, with an estimated annual revenue of USD of 74 millions. For her services to the travel industry, including in expanding awareness of little-known travel experiences in India and elsewhere in Asia, Chitra has also been recognized by the Ministry of External Affairs in India.



2. Khushboo Jain, Co-Founder and COO of ImpactGuru.com

Khushboo Jain and her husband, Piyush Jain, founded ImpactGuru in 2014, a crowdfunding website that helps patients who can't afford their medical expenses. The company is now the first female-led crowdsourcing platform in India. Before that, though, Khushboo spent over ten years in fashion marketing and branding. She gained an MBA from the Welingkar Institute of Management in 2010, specializing in marketing, and subsequently worked for high-profile brands, including Jimmy Choo and Hackett.



3. Farah NathaniMenzies, Co-Founder of The Mumum Co.

Farah pursued her business education in the U.S., graduating with a bachelor's in International Studies and Business in 2001 and subsequently starting a career at Bain & Company. She went on to graduate with an MBA from Harvard Business School and continued to work as a business advisor before launching her startup in 2016. She launched The Mumum Co. after struggling to find healthy snacks for her children in India. The brand quickly became a success, and in 2020, it was recognized as a Coca-Cola Golden Spoon Most Admired Start-Up. Farah also helped open up the conversation around how women can raise children and be entrepreneurs at the same time.



4. FalguniNayar, Founder and CEO of Nykaa

The year 2021 turned FalguniNayar into India's most prominent self-made female billionaire, and her journey to it is no less than incredible. She took the bold step of leaving a 20-year illustrious career as the Managing Director of Kotak Mahindra Capital Co. to start from scratch when she was just shy of turning 50. But graduating from IIM Ahmedabad and seeing her father run a small bearings business as she grew up, she just knew that she had it in her to become a successful woman in business. So, age didn't matter to her



5. SnehaChoudhry, Co-Founder of Zolo

Sneha was no stranger to entrepreneurship when she launched ZoloStays (now Zolo) in 2015. She had already founded two companies before she decided to fully focus her attention on her co-living and home rental booking platform. The company offers an alternative to often unaffordable long-term apartment rentals and helps foster local communities by enabling guests and residents to take part in local events.

6. HemalathaAnnamalai, Founder and CEO of Ampere Electric



Hemalatha started her business career in the late 1980s, working as a product manager. She pursued an MBA with a specialization in international marketing at RMIT University in Melbourne in 1995 and spent the next decade of her life writing code and selling software. It was a phone call from her husband, who attended a conference in Japan in 2007, that set her on the path to founding her own company Ampere Electric, after realizing India needed an electric revolution in personal mobility. The company manufactures electric cycles, scooters, and three-wheelers and, in 2018. As well as providing cleaner mobility to people living in rural locations in India, Hemalatha is also empowering women with her work.



7. KiranMazumdar Shaw, Chairperson and Managing Director of Biocon Ltd.

Cracking the prescription for global recognition, KiranMazumdar Shaw is the first-ever self-made female billionaire and a **successful businesswoman in India**. She is widely known as one of the most influential personalities in the field of biotechnology. But her entrepreneurial journey was not an easy one. *“As a woman entrepreneur, I had to build my credibility. I no longer consider myself a ‘woman business leader’.* But to get here, I've had to overcome many, many, many credibility hurdles,” she said.

Challenges Faced by Women Entrepreneurs

1. Lack of Social and Institutional Support

Most women business owners don't get the social support they require to kick start their business from families, peers, and immediate ecosystems. Lack of mentorship from the business community is also one of the main challenges faced by women entrepreneurs in the country. The case is no different when it comes to institutional support. Though there are schemes for promoting female entrepreneurship, many women don't receive timely guidance or help from authorities. The absence of a proper support network adversely impacts their confidence and ability to take risks.

2. Poor Funding Prospects

As unfair as it might sound, the funding scene in India has massive gender biases. Women-led businesses in the country lack access to capital due to the prejudices of investors and other factors. Many VC firms and angel investors are reluctant to invest in women-led businesses, while banks and financial institutions consider women less credit-worthy. Moreover, many Indian women don't have property or assets in their name, which comes up as a problem while applying for collateral loans or private financing.

3. Lack of Access to Professional Networks

Limited access to professional networks is another one of the basic problems of women entrepreneurs in India. According to the Google-Bain survey, female business owners are less integrated with formal and informal networks. The survey further indicates that over 45% of urban small business owners suffer due to insufficient avenues of network development.

4. Pressure to Stick to Traditional Gender Roles

Patriarchy conditions both men and women to play certain defined gender roles. Women are expected to cook, do domestic chores, raise kids, care for the elderly, and the like. Juggling familial and professional responsibilities is a challenge in itself, and even more so when you set out to build a brand. The pressure to stick to traditional gender roles is among the main challenges faced by women entrepreneurs. Often, they are asked to give up entrepreneurship and take up an "easy" profession that helps them focus more on family and kids. What's more, a woman who chooses her career over other things is looked down upon.

5. Lack of an Entrepreneurial Environment

Entrepreneurship is a long journey that involves a lot of learning, un-learning, and upskilling. An environment that exudes a strong entrepreneurial spirit is crucial for a person to become a successful business owner. However, many women often suffer from the lack of such a productive environment. To begin with, many women are forced to manage their businesses from home due to familial responsibilities. Consequently, they lose out on opportunities to go out, interact with the business community, and build their market access. It also impedes their learning opportunities, access to resources and mentors, and more.

6. Limited Mobility

Limited mobility is one of the basic problems of women entrepreneurs in India. They cannot travel alone or stay at hotels for business purposes without worrying about safety. What's more, many hotels in India still don't allow women to check-in unless accompanied by a man! Though many financially independent women have started investing in vehicles, the number of women owning motorized vehicles in India is still fewer than men. All these factors come together to restrict the mobility of female business owners.

7. Lack of Education

One of the biggest credentials for a modern entrepreneur is having prior experience in running a successful business. To supplement the lack of experience in running a business the entrepreneur should have professional experience of working in the relevant industry or a business management degree. Unfortunately in India, the education of women does not get its due importance. These results in many budding female entrepreneurs lacking the education required for running a successful business. As women are getting access to higher education, they are levelling the playing field.

Recommendations

Encouragement and support, from the family, society, and the government are the two most important things that motivate women entrepreneurs. There are a number of schemes and programs which are started by the government to boost the morale of and provide financing to women entrepreneurs.

- Facilitating financial support to women and providing loans at low or zero interest, to motivate women.
- Government can run training programs for women, at nominal or no fees to train them regarding the operation of machinery and other equipments.
- Conferences, workshops, seminars, and webinars can be organized for encouraging women.
- Forums must be established where prospective women entrepreneurs can talk and chat with successful entrepreneurs and discuss their queries and share knowledge.
- Certain policies and rules are required to be made for women's empowerment.
- Help desk, websites and support forums can help in getting instant help.
- Encouraging home-based businesses, so that women can effectively coordinate with household and entrepreneurial responsibilities.
- The loan procedure by banks and other governmental organizations needs to be simplified.

Conclusion

The empowerment of women by way of women entrepreneurship encompasses three main factors i.e. access to resources and market, majority ownership, and active control. Here, it must be noted that the education of women entrepreneurs is important, however, the most important thing that they must possess is the basic knowledge of the language and entrepreneurial skills.

References

1. [https://www.worldwidejournals.com/indian-journal-of-applied-research-\(IJAR\)/fileview/January_2019_1546343548__168.pdf](https://www.worldwidejournals.com/indian-journal-of-applied-research-(IJAR)/fileview/January_2019_1546343548__168.pdf)
2. <https://www.mba.com/business-school-and-careers/career-possibilities/30-most-successful-women-entrepreneurs-in-india-part-1>
3. <https://www.theofficepass.com/toppings/top-problems-faced-by-women-entrepreneurs-in-india.html>
4. <https://beingintelligent.com/women-entrepreneurship.html>

CHAPTER 21

TEACHING WRITING SKILLS: DIFFERENT APPROACHES

Dr. C. RAJYALAKSHMI

Assistant Professor /Head Department of English
Government Degree College Kuppam

Abstract

English Language has a significant impact particularly in a country like India, where agriculture is the main occupation. English is studied quite late in primary education in many parts of our country. Of all the four skills of English language namely Listening, speaking reading and writing. Writing is a complex skill of cognitive ability with mixed approaches and lexical structures. Acquisition of writing skills at lower level definitely helps in one's career. Writing to communicate is rather a difficult task. It goes beyond copying a text or using others words it needs creative abilities, that is difficult to master.

Students should be able to create a literary component of their own using mental skills and objective language. For a long time, it has been consistently felt that writing as a skill is often neglected. Learning to write short stories, articles letters needs to be nurtured in the class room once in a while. A habit needs to be cultivated among the students to write of their own. An open event to enhance writing skills through different motivational patterns needs to be conducted at the Institutional level. As a result, the current research focuses on instructional methods for improving college student's writing skills in Government Degree College Kuppam.

Keywords: *Mixed approaches cognitive ability, Educational journey, Grammar, Productive skill*

Introduction

Teaching writing skill at a given classroom has always been treated as an underappreciated activity at Government Degree Colleges for under graduate students. However, in the modern era with the advent of software industries writing has become inseparable component of language skills needing utmost attention. Communicating quickly and effectively is the corner stone of any profession. No matter how unrelated writing may seem to a particular field, it's important to regard your writing as an essential component of your skillset.

Having sharply honed writing skills can help you clearly and quickly communicate updates, events projects or other important topics to coworkers without requiring additional time for clarifications of questions. When it comes to figuring out how to write in practical terms, the emphasis is always on clarity of thought that jargon of words, both from a linguistic and business point of view. Structuring the content, developing the thoughts putting them on the paper in tune with the context in adequate style needs proficiency. Writing big paragraphs with huge sentences, lines, entries can only be done if the writer is aware of the content to be written.

Importance of Writing Skills for Students

Communication oral and verbal, is one of essential skill every student must master to be able to succeed not only in their academics but in life as a whole. Because to be honest, without communication, the essence of life would be lost, which is why writing has been deeply integrated into the school curriculum as a way to significantly improve the communication skills of students. Students can learn various avenues of language. Writing improves grammar, spelling, punctuation, gestures and paralinguistic's and so on as they are basics of communication. The "frontal cortex" or the seat of creativity is sharpened when you write consistently. Writing can also widen our knowledge capacity always careful reading and cautious interpretation is followed by writing. Writing needs a lot of rethinking and research. This leads to widen your knowledge and leads to excellent memory.

Writing as an activity extends beyond the classroom. Students who can read fluently and write well are always sought by all the teachers. In this modern era of Internet still writing as a skill that has opened several job opportunities. Messages, online chat sessions, projects, fax and web pages all necessitate exceptional writing abilities. Writing increases confidence levels leading to sense of achievement, a strong sense of fulfillment as your literary skills have created a new text. Writing relieves us from mental stress, creates a new perspective for broader thinking and boosts our prioritizing skills. The students are taught to brain storm a topic and then organize the contents in to a paragraph. Better expression of self is possible through good writing skills. Good critical thinking is generated within our selves. Good writing skills are needed to decode or deconstruct a text.

Writing always has been a complex activity probably the most difficult of all the four skills. The real writing involves clear writing, appropriate punctuation and lexical strategies, spell correctly and select the proper language register. Exception writing requires focus, development, unity coherence and correctness. To overcome the fear of writing, a student needs to master a variety of approaches and effective methodologies aimed at motivating students to express themselves in writing and educating them on the advantages of great writing,

Various Approaches for Enhancing Writing Skills

There is no answer to the question of how to teach writing skills in a given classroom. It remains to the feasibility and adaptability of the teacher and the taught to take and give the best. It remains to the vision of the teacher to select the most practical method and methodologies.

Free Writing Approach

Free writing is commonly a writing strategy wherein a person writes non stop for set period of time for the purpose of practice. It can be termed as a target fixed by the writer himself or on the instruction of the teacher. This writing strategy does not follow any mechanics of writing. The end result comes out with certain unpolished views and unusable material. This is a strategy used to create self confidence and gather initial information on the topic. The content is ambiguous and unstructured.

The Controlled Approach

Controlled writing learning is a learning model used by teachers where learners are given structured modules to put their writing on the page. It is practiced from the early years of schooling. This type of writing focuses on form and technique than content. It helps in understanding building blocks of language. Helps in clear focus on writing. Templates are given to students with activities for a guidance and shaping the content. In free writing students are given an open-ended activity whereas, in controlled writing a clear set of format for the writing task is given.

The Paragraph-Pattern Approach

This approach is based on the principal that in different culture or situations, people construct and organize communication with each other in different ways. Students are taught to analyze that are typical to that particular language. Organization of content is given importance than grammar and they signal how the facts would be presented. A good paragraph has a topic sentence, relevant supporting sentences, and a closing sentences.

The Grammar-Syntax Approach

This view point implies that writing should not be viewed as a collection of independent talents that are developed separately. Students understand the difference between what they want to write and what they need to write. This method connects the reason for a piece of writing to the basic designs for communicating the message.

The Communicative Approach

Communicative approach involves the learner fluency-based task in the classrooms to create confidence in them for expressing meaningful communication. Development of four skills speaking, listening, reading and writing is integrated from the beginning, since communication integrates the different skills. The five elements in this approach like topic, writer, reader, language and purpose work together to shape good writing within real communication as core assessment helps maintain learner's motivation.

The Process Approach

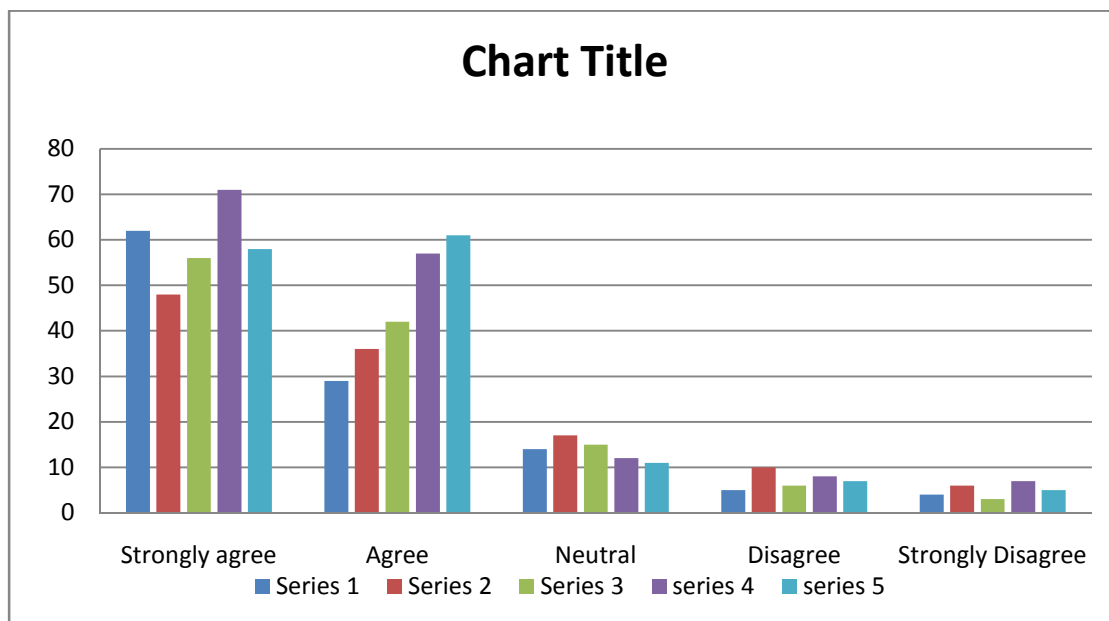
The process approach treats all writing as a creative act which requires time and positive feedback to be done well. In process writing, the teacher moves away from being someone who sets students a writing topic and receives the finished product for correction without any intervention in the writing process itself. Writing is a process that can be divided into three stages: Pre-writing, drafting and the final revising stage which includes editing and proof reading. Writing is a perplexing, recursive and innovative evolution of mind and thought. Learning how to write messages is a

capable and fruitful way of dealing. For the purpose of analysis, 100 students were selected from Bachelor of commerce at Government Degree College Kuppam and asked a series of questions.

Table 1 Respondents ‘opinion on different Dimensions on learning writing skills in a college:
(SA- Strongly agree: A-Agree :N- :DA Disagree: SDA- Strongly Disagree)

S.No.	Respondents	S	A	N	D	SD
1	My college gives me all additional support to upgrade my writing skills.	62	29	14	5	4
2	All the teaching staff of English are using the latest techniques and technology to improve writing skills.	48	36	17	10	6
3	Blended learning helps me a lot	56	42	15	6	3
4	This way students can be motivated to write scholarly articles.	71	57	12	8	7
5	The college gives me all the fundamental help	58	61	11	7	5

GRAPH



Improving Writing Strategies in Students

1. Dairy writing is a strategy that improves writing capability of a student. Teachers need to monitor the task given daily.
2. Asking students to write down new words regularly by giving an alphabet everyday.
3. Paraphrasing is a proven technique to improve writing skills. Asking the students to rewrite the content in their own words.
4. Peer learning students are divided into groups are asked to evaluate the content of each other.
5. Guiding them through the writing process.
6. Enough resources from the Institution to instill confidence among the students.
7. Regular competitions pertaining to writing to be conducted in the institution.
8. Teachers need to acquaint themselves about the new technologies.
9. Literature to be taught at all levels.
10. Students should be made aware of writing difficulties often.
11. Text books and materials to be designed keeping in view the importance of writing,
12. Instructors need to inculcate culture of learning in the students.
13. English libraries are important for students.
14. Students need to be asked to demonstrate their writing abilities often.
15. Teacher needs to be a role model to take the lead.

Conclusion

Although strong writing skills are required for long term student success. Various factors influence success or failure of teaching writing .The student centered and teacher center approach both need to be collaborated for effective results. Writing is a thinking cycle that necessitates a conscious analytical effort over a long period of time. It's not an overnight activity.It remains to the patience, perseverance and passion, of teacher to help his students to become active and effective writers.

References

1. Sitaramaiah,B.P., The History of the Indian National Congress, (Bombay, 1946) P.5
2. Ramesan, N. Andhra Pradesh District Gazetteer, Visakhapatnam (Hyderabad, 1979), P.40
3. Bipin Chandra & others, Freedom Struggle (New Delhi, 1972), P.5
4. Venkatarangaiya, M., The Freedom Struggle in Andhra Pradesh (Andhra) (Hyderabad, 1969), Vol. II, P.V. 5.
5. Rajagopal, M.V., APDG, Krishna District (Hyderabad 1977), P.55
6. Ramesan, N. APDG, Visakhapatnam (Hyderabad, 1979), P.41 8.
7. Rajagopal, M.V., APDG, Krishna District (Hyderabad 1977), P.55 9.
8. PrasadaRao, TSV, Andhra Christians: Indian Freedom Movement (Guntur, 1997), P.23
9. Ramesan, N. APDG, Visakhapatnam (Hyderabad, 1979 P. 37, 38 11.
10. Sukhendra Reddy, K., APDG, Vizianagaram (Hyderabad 2000), P.43 12.
11. Bipin Chandra &others, Freedom Struggle (New Delhi, 2007), P.81.
12. C. Vijayasree, T. Vijay Kumar. Kanyasulkam by GurazadaAppa Rao.Book Review Literacy Trust, 2002.
13. Narla., V.R., Makers of Indian Literature: Gurazada. SahityaAkademy: Delhi, 1979.
14. https://www.academia.edu/29066772/_The_Rise_of_Telugu_Novel_A_Dalit_Critique

CHAPTER 22

RUDIMENTS OF LANGUAGE SKILLS

Dr. LANKE SUBHA

Assistant Professor, Department of English
Andhra Loyola College, Vijayawada

Abstract

Humans are blessed with the ability to vocalize; which is not in other. Language is one of the sources to communicate our ideas, thoughts, feelings and emotions to others. Language reflects one's Knowledge, Personality and Origin. It not only helps us to maintain good relationship but only expands our cultural knowledge beyond the horizons. Hence, learn to communicate effectively improves the language skills. An effective communicator need to acquire the four skills- Listening, Speaking, Reading and Writing. These skills enrich the knowledge of a person. So, Communicate to exhibit talent, to enhance skills, to enable growth and development of the nation. The present paper tries to communicate the essential skills for developing the language.

"To effectively communicate, we must realize that we are all different in the way we perceive the world and use this understanding as a guide to our communication with others." - Tony Robbins

Listening Skill

To communicate effectively a person should possess sound knowledge in language. Language acquisition can be done through LSRW skills- Listening, Speaking, Reading and Writing. A child acquires the native language within its domain through listening; later develop speaking ability followed by reading and writing. In 1957, Carl Rogers and Richard Farson coined the term active listening, in a short book presenting the method as one that "requires that we get inside the speaker, that we grasp, from his point of view, just what it is he is communicating to us. Listening is a receptive skill that enables a person to know the sound, rhythm, intonation and stress in his sensory organs. After indentifying the sounds sifting takes place where the wanted is separated from the unwanted then assimilation of the information is done. During this process, comparison with prior knowledge is done to judge and understand the information received, and the contradictory ideas or opinions give way for queries that are raised for clarification. Thus, Listening is one of the importantskills for language acquisition.

Benefits of Listening

- Develop s Interpersonal Relationships.
- Resolve Crisis
- Acquire Knowledge
- Gains Self Esteem
- Helps in Communication.
- Seek Clarification
- Draw Attention
- Judge the Speaker's ability
- Develops Clarity of thought

Speaking Skill

Speaking skill helps a person to express his feelings, opinions, thoughts or ideas before the other. Speaking develops interpersonal skills, resolves problems, develops communicative skills, enhances confidence, shares cultural abilities, promotes interdisciplinary learning, and extends support for upliftment. Robert Frost once said: "I am a writer of books in retrospect, I talk in order to understand, I teach in order to learn." The words rightly say that through teaching learning is done i.e. speaking develops learning as well as sharing of knowledge takes place. The famous Swiss Linguist Ferdinand de Saussure views language as "Having an inner duality, which is manifested by the interaction of the synchronic and diachronic, the syntagmatic and associative, and the signifier and signified." Developing language ability is done through the comparison of once knowledge of language with his/her domain or

learning the origin of the language, identify the similarities or dissimilarities and the use of word that signifies the idea that is represented. As Saussure explained, “Speech always implies both an established system and an evolution; at every moment it is an existing institution and a product of the past.”Saussure points out that ‘speech’ is individualized in that it is produced wilfully and intellectually by a person, by way of ‘speaking’

Benefits of Speaking

- Enhances one’s Research abilities
- Build up Self Esteem
- Advancement in Career
- Creative and Critical thinking skills
- Logical and Analytical skills
- Widen the Special Domain
- Sharing of Knowledge
- Broaden the scope of language skills
- Extending the Cultural skills
- Understanding the Societal needs

Reading Skill

Reading skill helps a person to identify the symbols, words, sentences and comprehend to acquire the intended meaning of it. A child learns to read the images easily rather than letters as visual colourful images attract the attention of the reader and has a long lasting print in the young minds rather than words. Bloomfield suggested that children learning capacity is more when words are associated with images which develops familiarity. Chomsky's theory is based on the idea that all languages hold similar structures and rules, also known as a universal grammar. This theory states that all languages have formal universals and principles in common, with specific options and limits for variation in grammar and features between languages. The language acquisition for a person requires the innate capacity i.e. the human brain structures naturally to acquire the language. Hence, a reader consciously and unconsciously stores the information in his brain while reading, that in turn reflects in the development of the language.

Benefits of Reading

- Increases vocabulary
- Enhances imagination
- Expands knowledge
- Stimulates brain
- Improves memory and focus
- Strengthens writing skills
- Reduces stress
- Visualize the different perspective of the writer
- Develops the imaginative ability
- Pre judge the ideas
- Correlate the opinions with the others

Writing Skill

Writing skill is needed to express our thoughts or suggestions in the form of written message to the others. To draft a message a person should get the idea which is organised in the form of a message through the selected language in a well constructed form. Hence acquire cohesiveness, completeness and accurateness in their writing. It extends the knowledge of the person in the field of linguistic extensively.

Phonetics - the study of how speech sounds are produced and perceived.

Phonology - the study of sound patterns and changes.

Morphology - the study of word structure.

Syntax - the study of sentence structure.

Semantics - the study of linguistic meaning.

Once a person is skilled in expressing his views to the others without any syntactical errors he/she gains the confidence to communicate effectively without taking sides.

Benefits of Writing

- Scope to develop Creative ability
- Good Career opportunities
- Gain wide Knowledge
- Develops Vocabulary
- Become Expressive
- Increases one's imaginative abilities
- Clarity of thoughts
- Memory power
- Growth and development of language

A Communication Tool

Language is an effective tool for communication. It refers to the systemic use of language elements like syntax, morphemes, and phonemes. To make communication effective a person should be proficient in LSRW skills. Each language has its own uniqueness, identifying and acquiring it is essential. So paying the attention to learn and acquire the skills leads to progress in life and enriches the overall living standard of lives in the society.

References

1. <https://medium.com/@lilanirfreelance/saussures-linguistic-terminology-signs-language-chains-and-associations-6bfe938b7ffc#:~:text=Ferdinand%20de%20Saussure%20views%20language,and%20the%20signifier%20and%20signified.>
2. <file:///C:/Users/Win10/Downloads/Language%20as%20a%20Tool%20for%20Communication%20and%20Cultural%20Reality%20Discloser.pdf>

CHAPTER 23

PHYTOREMEDIATION OF SOIL POLLUTANTS FOR BETTER USAGE IN AGRICULTURE

L. Md. BHAKSHU & C. MEERA SAHEB

*Lecturer in Botany, PVKN. Government College (Autonomous)
Chittoor, Andhra Pradesh*

Introduction

The improvement in the human life and civilization is ever appreciated and on the other side we have to take utmost care on the habitat where the entire creatures including human has living on this plant Earth. This is our customary to protect our environment from various types of pollutants which are released by human activities or industrial processes. The environment in which soil, atmosphere or aquatic habitats are regularly contaminated by the different types of effluents and few of them are highly toxic to living world disturbing the normal flora and fauna. The soil is one important natural resource which is base to the entire living world. The soil formation is a slow process and take hundreds of years to produce surface soil which is congenial for the creatures. Due to increasing population, the human habitats are spreading and declining the arable land and is the only source for industries together. Hence the soil is prone to contaminate with various pollutants. Among these, heavy metals are playing important role and a variety of heavy metals including Mercury, Nickel, Cadmium, Chromium, Lead etc., causing not only soil pollution and also hazardous to health of all living organisms. One of the solution for the protection of effects of heavy metals is Phytoremediation, which is emerging and attracting the young scientists to make affected soil treatment.

The “Phytoremediation is the name given to a set of technologies that use different plants as a containment, destruction, or an extraction technique” which has stated by Timothy Oppelt (2000). Phytoremediation is an upcoming technology that uses different species of plants to extract, retain, break down, or inactivate the pollutants from water and soil. This technology has recently attracted attention as an innovative and cost-effective alternative to advanced treatment methods used at hazardous waste sites. The US Environmental Protection Agency (EPA) seeks to protect human health and the environment from the risks associated with hazardous waste disposal and to encourage the development of innovative technologies such as phytoremediation to more effectively to remediate contaminated sites (Timothy Oppelt, 2000).

Phytoremediation, using inexperienced plant life to deal with and manipulate wastes in water, soil, and air, is a crucial part of the brand new area of ecological engineering. In situ and ex situ packages are ruled with the aid of using polluted site or soil and water characteristics, nutrient sustainability, meteorology, hydrology, viable ecosystems and contaminant characteristics. Most procedures related to phytoremediation are less expensive because of the reliance on daylight and recycling of nutrients in situ.

However, remedies of over huge-land regions and longer instances are typically constrained to root zones and shallow water. Applications of wetlands, grasslands, crops, and tree plantations had been a hit for loads of wastes, typically found in low concentrations that aren't acutely phytotoxic. Organic and inorganic wastes encompass metals and metalloids, a few xenobiotic contaminants, and salt leachate, sewage, sludge, and different traditional wastes. Some redundant or back-up remedy can be important relying at the acuteness of toxicity to offset the range of organic systems. However, only a few phytoremediation strategies had been optimized for sustainability on the usage of the essential standards of ecological engineering. Applications of monocultures of hybrids and from time to time alien species, and ecosystems of plant life and microorganisms are viable however tough to use in a few cases. Self-engineering and self-layout has to be explored and used to use sustainable ecosystems to manipulate wastes. The key to making use of sustainable ecosystems is the understanding of the genetic and proteomic range important to pick plant life and different organisms with most useful role to convert or gathering pollutants (Sameen et al., 2016).

Phytoremediation can be used to clean up the contaminants such as metals, pesticides, solvents, explosives, crude oil, poly-aromatic hydrocarbons and landfill leachates from the environment. Phytoremediation is an essential, eco-friendly, cost-effective as well as a sustainable solution to the problems leading to environmental contamination. Phytoremediation may be used in two ways either in situ or ex situ. It requires the use of plants that helps in uptake,

accumulation, detoxification, translocation, and volatilization of inorganic and organic pollutants from the contaminated soil and water. The important constraints of phytoremediation are time-taking procedures and restrained to the buildup and tolerance of metals from the soil-sites having a excessive concentration. Thus, to enhance and decorate the phytoremediation procedure there may be an urgent requirement to increase new insights.

Metal Recovery

Phytoremediation offers an opportunity to increase the financial possibility of programs and to reduce disposal risks through the utilization of metal enriched plant biomass in energy and metal recovery with the incineration process.

A few of valuable metal ions such as Zinc, Nickel, Selenium and Iron were processed through the phytoremediation (phyto-minig) as well as bio-fortification (useful in edible plants or vegetables, grains etc.). This can be done through several processes, such as agronomic practices, conventional plant breeding and modern biotechnology. Combining bio-fortification with phytoremediation is a new idea to tackle malnutrition and environmental remediation (Pandey and Bajpai, 2019). More than three hundreds plant species are reported to act as rhizo-filters, beneficial in phytoremediation and termed as hyper-accumulators. For example, *Alyssum lesbiacum* is a Ni hyper-accumulator and *Arabidopsis halleri* is a Zn hyper-accumulator. Plant selection and target metal decides the outcome and financial risks of phytoremediation programs besides that high biomass producing plants and high value-added metals produce significantly more income (Pandey and Bajpai, 2019).

Phyto-remediation using genetically modified plants

Biotechnological interventions like genetic engineering to the phytoremediator plant species have been found helpful to speed up the metal accumulation, translocation and detoxification significantly. The most common host plants tested for phytoremediation are genetically modified (GM), including *Nicotiana tabacum*, *Oryza sativa*, *Arabidopsis thaliana*, *Sedum plumbizincicola*, etc. (Shreya Singh et al., 2022).

Value added future prospective

Phytoremediation is an emerging technology helping to clean the soil and water bodies from noxious pollutants. It may give opportunity for the establishing a cost effective rural employment for producing safe and viable agriculture technology which are rapidly effected by the polluting agents. The scientific community has to bridge the farmers and the phytoremediation technology for better usage of land in agriculture which is essential in developing countries.

The research on phytoremediation requires a proper understanding of processes and mechanisms, which foster phytoremediation, the tolerance of plant species for saline or polluted soils. One of the major challenges is marketing the agricultural products, which are produced through the phytoremediation. Further research is required to commercialize the technique on a large scale and will ensure the food security in a sustainable way and will make the planet Earth more congenial place to live. The awareness programmes are also being propagated to educate the society about the phytoremediation. However, the research has to be focused on the effect of accumulated metal remains in the vegetables on the food chain and its consequences.

References

1. Timothy Oppelt E (2000). Introduction to Phytoremediation. EPA/600/R-99/107 February 2000 National Risk Management Research Laboratory Office of Research and Development U.S. Environmental Protection Agency Cincinnati, Ohio 45268.
2. Sameen R. Imadi,, Parvaiz Ahmad (2015) Plant Metal Interaction, 2016. Phytoremediation of Saline Soils for Sustainable Agricultural Productivity. <https://doi.org/10.1016/C2014-0-03536-8>.
3. Pandey V.C., Bajpai O.(2019). Phytoremediation: From Theory Toward Practice, Chapter 1, Editor(s): Vimal Chandra Pandey, Kuldeep Bauddh, Phytomanagement of Polluted Sites, Elsevier, Pages 1-49.
4. Shreya Singh, Lala Saha, Kuldeep Bauddh (2022). Phytoremediation potential of genetically modified plants, Chapter4 - Editor(s): Kuldeep Bauddh, Ying Ma, Advances in Microbe-assisted Phytoremediation of Polluted Sites, Elsevier, 2022, Pages 85-100.

CHAPTER 24

USE OF IRON OXIDE NANOPARTICLES IN CURRENT CELL BIOLOGY AND EXPERIMENTAL PHYSIOLOGY RESEARCH

DEVANAND CHAUDHARI¹, Dr. GOPAL PANDA² & Dr. S.B. SINGH³

Research Scholars, Sarvepalli Radhakrishnan University, Bhopal

Abstract

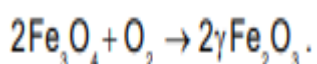
Iron oxide nanoparticles (IONPs) have recently been shown to possess certain extraordinary chemical properties that make them valuable in both experimental physiology and cell biology studies. These nanoparticles might be used to deliver anti-cancer drugs and other treatments. Moreover, IONPs may be a useful component of several innovative bioassays in numerous basic medical domains. IONPs may have some cytotoxic and genotoxic potential in biological systems, according to a number of recent research. IONPs may stimulate the production of reactive oxygen species and lead to oxidative stress in some cell types when used in vitro. The toxicity of IONPs is not yet fully understood, and additional research is needed to confirm if IONPs have detrimental effects on human health. This short article focuses on the recent developments and trends in the fields of nanomedicine and nanobiology regarding iron oxide nanomaterials and their application in fundamental medical disciplines such as experimental physiology. We discuss our previously published works on structural effects of IONPs and other metallic nanoparticles on cell nucleus in in vitro conditions. We also describe our recent findings regarding the impact of IONPs on certain biophysical properties of subcellular components.

Introduction

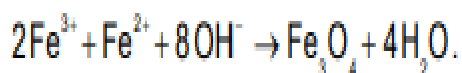
Recent years have seen a significant increase in the amount of research being done on iron-based nanomaterials in the areas of basic medical sciences and cell biology. Iron oxide nanoparticles (IONPs), like other nanomaterials, have certain significant physical and chemical characteristics that may make them useful as drug delivery systems, components of different bioassays, and maybe even diagnostic processes. IONPs are seen to be great candidates for introduction to various types of clinical practise because of all these potential medicinal applications, provided that they don't demonstrate considerable toxicity on human tissues and organs [1-3]. Due to their special paramagnetic characteristics, iron oxide nanoparticles may be utilised in magnetic hyperthermia, an experimental therapy for several forms of Cancer. Ferrite particles typically become superparamagnetic when they are sufficiently tiny. This basically indicates that while magnetic behaviour remains after exposure to an external magnetic field, self-agglomeration does not. While the surrounding structure is mostly unaffected, its induction and control by an external source can be employed to specifically target and harm tumour tissue [2,4,5]. This brief essay focuses on recent advancements and developments in nanomedicine and nanobiology with reference to iron oxide nanoparticles and their usage in basic medical sectors including experimental physiology. We review the structural effects of IONPs and other metallic nanoparticles on cell nuclei under in vitro settings from our previously published research. We also discuss our most recent discoveries addressing how IONPs affect certain biophysical characteristics of subcellular components.

Chemistry of Iron Oxide Nanoparticles

IONPs are nanoparticles that are between 1 to 100 nanometers in size, similar to other nanoparticles. Magnetite (Fe₃O₄), which contains both Fe³⁺ and Fe²⁺ in its structure, and maghemite (-Fe₂O₃), which contains iron in the trivalent form, are the two main chemical kinds of IONPs with varying properties [2,4-6]. Magnetite is quickly converted to maghemite due to its propensity for oxidation:



There are several techniques for creating IONPs. In many laboratories, coprecipitation is a rather frequent technique. Aqueous solutions can be used to mix ferric and ferrous hydroxides to create comparatively stable magnetite nanoparticles:



Controlling the particle form and size is one of the primary potential issues during the synthesis of IONPs. They are dependent on a variety of variables, some of which are controllable in a lab environment. These consist of the solution's acidity, temperature, overall ion concentration, and the addition of other chemicals.

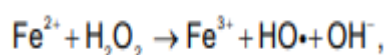
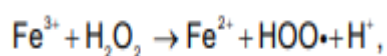
In physiology and cell biology, the changes in IONP structure and diameter are a key problem that might have a big impact on study findings and experiment validity. In biomedical research, IONPs are used to expose cells and tissues, and then the necessary measurements are taken (i.e. parameters of oxidative stress, apoptosis, changes in gene expression, changes in signalling pathways etc.). Yet, in terms of ion concentrations, acidity, and other chemical and physical parameters, the internal environment might vary dramatically from the external environment. The chemistry of iron-based nanomaterials may be affected by all of these variables, which may alter their size, surface area, shape, and other characteristics [2]. Iron oxide nanoparticles may occasionally transform into regular iron oxide compounds with a diameter greater than 100 nanometers, losing their identity as nanoparticles in the process.

Thus, one of the key inquiries in nanobiology is this: Is a nanoparticle's (morphological or physiological) impact on a live cell a direct outcome of the nanoparticle itself, or does the nanoparticle undergo transformation into a new substance, ion, or bigger molecule before impacting the cell? However, this topic has not been adequately addressed in many experiments and published papers, which might impede future efforts to comprehend the genuine biological impacts of metallic nanoparticles.

Iron-Based Nanomaterials and Parameters of Oxidative Stress

Oxidative stress is often caused by either an increase in the synthesis of compounds that are reactive oxygen species, or by a loss in an organism's or cell's capacity to either remove these substances or repair the harm they have caused. In physiological settings, peroxides, superoxide, hydroxyl radicals, and singlet oxygen are all created, either as byproducts of diverse chemical and metabolic events or with a specialised purpose in a physiological process (i.e. in immune system). The genetic material within the cell may suffer damage from oxidative stress products in a variety of ways, including the breaking of DNA strands. In turn, this may impair the normal synthesis of proteins and, in certain situations, result in the cell's malignant transformation [7–12].

Reactive oxygen species generation may occasionally be increased by metal ions. Given that metal ions may serve as an electron donor or receiver, this might be accomplished by redox cycling. These interactions are also possible between iron ions. Ferrous iron and hydrogen peroxide may effectively oxidise organic compounds using the "Fenton chemistry" principles. Additional free radicals can be created when hydrogen peroxide is reacted with either Fe 2+ or Fe 3+:



The buildup of DNA damage, protein inactivation, the disruption of signalling pathways, and the ageing process may all be significantly impacted by the Fenton reaction.

Despite several significant research and publications, it is still unknown whether and how quickly IONPs could cause the production of reactive oxygen species. Iron oxide nanoparticles may damage cerebral tissue by changing glutathione levels and significantly boosting redox cycling because of their huge surface area, according to a recent paper by Yarjanli et al. (2017) [13]. An essential antioxidant, glutathione, is reduced back to its original form by glutathione reductase with the aid of nicotinamide adenine dinucleotide phosphate (NADPH). The link between iron-based nanomaterials, other iron compounds that are not nanoparticles, and glutathione levels in tissues other than neural would be fascinating to investigate in the future..

In rat peripheral blood cells, Gaharwar and Paulraj (2015) investigated possible oxidative damage [14]. Fe₂O₃ nanoparticles may have caused oxidative stress by triggering an inflammatory response in the Wistar rats used in the study. Fe₃O₄ nanoparticles have been discovered by Ahamed et al. (2013) to also cause oxidative stress and even genotoxicity in in vitro settings [15]. Moreover, it was shown that Fe₂O₃ nanoparticles produced oxidative stress, DNA damage, and caspase activation in the human breast cancer cell line [7]. As it offers a thorough understanding of not only intracellular ROS but also catalase activity, superoxide dismutase, the degree of membrane lipid peroxidation, and glutathione estimate [7], the work by Alarifi et al. (2014) is especially intriguing.

Iron Oxide Nanoparticles as Delivery System for Active Substances

The delivery of drugs to injured tissues and cells may be targeted using iron oxide nanoparticles as the delivery system. This idea is not new, and various studies have attempted to link the distinctive physical and chemical properties of IONPs with their capacity to deliver a drug or another active substance to a particular area of the body [4,16–27].

For instance, in 2008, Beata Chertok and colleagues [28] conducted a study in which they looked at the possibility of using IONPs as a magnetically targeted delivery method for orthotopic 9L-gliosarcoma in a rat experimental model. The breadth and selectivity of nanoparticle accumulation in cancer tissue were estimated by the scientists using magnetic resonance imaging. After magnetic targeting, it was shown to be substantially more likely that the tumour would be exposed to nanoparticles [28].

Magnetic IONPs can be used to deliver drugs to breast cancer cells. According to Marcu et al 2013 's study, the antacycline antibiotic Violamycine B1 has specific anti-tumor actions on the MCF-7 cell line of breast cancer [29]. Nevertheless, it should be highlighted that nanoparticles only improve the drug's cellular absorption and availability/delivery rather than increasing the drug's effectiveness.

Moreover in 2013, Xing et al. succeeded in encapsulating the anti-cancer medication doxorubicin (DOX) in the hollow porosity of the particle system and applying chemical alterations to hollow iron oxide nanoparticles [30]. Dopamine and human serum albumin (HSA) were used in this procedure. This transporter increased drug absorption into multidrug resistant OVCAR8-ADR cells effectively [30].

Another study effectively delivered sodium meclufenamate, an anti-inflammatory medication, using hollow magnetic iron oxide nanoparticles. The urea/FeCl₃.6H₂O compound and the solvent ethylene glycol were used in the solvothermal breakdown process by Alan et al. (2016) to create the IONPs [17]. This in vitro chemical experiment evaluated sodium meclufenamate's potential for adsorption and release [17].

Future work must address a number of crucial concerns before IONPs can be successfully used as drug carriers in clinical practise. Initially, in order to better understand the pharmacokinetic characteristics of IONPs of various shapes and sizes, thorough testing on animal experimental models are crucial. This covers research on the particle dispersion, accumulation, and removal in a live body. Clarification is also required about how IONPs interact with the tissues of the kidney and liver. Second, it's important to assess how well IONPs deliver drugs to tumour tissues. This covers the efficiency of delivery as well as the rate of cellular absorption and accumulation, accumulation of IONPs in healthy tissues, and deposition of IONPs. Finally, more research on IONP toxicity is required. Iron oxide is typically thought of as being relatively non-toxic as a molecule, but when it is formed into nanoparticles, critical chemical properties may alter, causing harm to cells and tissues. Oxidative stress is but one potential outcome. Examining genotoxicity, nephrotoxicity, and hepatotoxicity is also necessary. The interactions between IONPs and the immune system are also poorly understood. In live beings, it is unknown if iron-based nanomaterials can have immunostimulatory, immunosuppressive, or any other immunomodulatory effects. IONPs won't be a crucial component of traditional therapeutic techniques in cancer, internal medicine, and other clinical fields until all these problems have been resolved.

Effects of Iron Oxide Nanoparticles on Structure of Cell Nucleus

Many research have recently attempted to look at potential connections between IONPs and the genetic material in the nucleus. The discovery that IONPs may produce chemicals from reactive oxygen species suggests that these

nanoparticles could occasionally harm DNA and the nucleus of cells. In fact, several scientists have hypothesised that IONPs may have some potential for genotoxicity; however, these hypotheses need to be verified in subsequent research.

The notion that IONPs may alter the structural characteristics of the whole nucleus is particularly intriguing. Our most recent research found that IONPs cause time-dependent alterations in the nuclear fractal properties of buccal epithelial cells [31]. We gave these cells an IONP treatment before measuring the fractal dimension (a metric of complexity) and lacunarity (an indirect indicator of fractal heterogeneity) at various time intervals. After the therapy, we saw a statistically significant rise in nuclear lacunarity and a decrease in fractal dimension. Comparative to other studies that solely examined genotoxicity at the molecular level, this study suggested that alterations in the genetic make-up of the cells following exposure to IONPs may be evident at a higher level of structural organisation (nucleoplasm level). The nuclei's observed modifications resembled those from the earlier work on silver nanoparticles in several ways [32].

The possible impact of IONPs on the textural characteristics of cell nuclei is the main topic of our present study. The Grey level co-occurrence matrix approach, which is essentially a statistical technique that uses second order statistics to derive textural features including entropy, angular second moment, and inverse difference moment, is used to quantify nuclear texture. Our first findings show that after treatment with IONPs, there is a time-dependent increase in nuclear textural entropy. Using this type of mathematical methodology, our results imply that IONPs may enhance the degree of structural disarray in cell nuclei. For instance, we observed a rise in nuclear entropy on a sample of 30 buccal epithelial cells from a value of 5.32 to an average value of 5.81 (more than 9% increase), which is significant given the precision and relative accuracy of the approach. According to our knowledge, this is the first study to use this type of mathematical approach to evaluate the impacts of IONPs in this experimental environment.

Concluding Remarks

Iron oxide nanoparticles can be used in a variety of medical specialties and are potentially significant drug delivery systems. According to recent study, IONPs possess several outstanding chemical properties that make them valuable in both experimental physiology and cell biology research. There have been hints in recent years that IONPs may stimulate the production of molecules associated with reactive oxygen species. As it may limit the use of IONPs in clinical medicine, oxidative stress caused by IONPs is a crucial concern in contemporary pharmacology research. Before IONPs are used as part of customary diagnostic and therapeutic procedures in clinical practise, concerns about their toxicity must be addressed. In particular, genotoxicity, nephrotoxicity, and hepatotoxicity are affected in this way. Future research in the areas of molecular biology, physiology, and cancer is anticipated to concentrate heavily on IONPs.

References

1. *Int Rev Neurobiol* 130 (2016) 199; Sintov, C. Velasco-Aguirre, E. Gallardo- Toledo, E. Araya, and M.J. Kogan.
2. *Rev. Adv. Mater. Sci.* 49 (2017) 123 Paunovic, Vucevic, T. Radosavljevic, S. Pantic, D. Nikolovski, and I. Pantic
3. *Nano Research* 6 (2013): Xing, A. Bhirde, S. Wang, X. Sun, Liu, Y. Hou, and X. Chen 1.
4. *Chem Rev* 108 (2008) 2064 Laurent, Forge, M. Port, A. Roch, Robic, L. Vander Elst, and R.N. Muller
5. *Advances in Crystal Growth and Characterization of Materials* 55 (2009) 22. A. Teja and P.Y. Koh.
6. *Hand Book of Magnetic Materials* by K.H.G. Buschow (Elsevier, New York, 2006)
7. D. Ali, S. Alkahtani, S. Alarifi, and Alhader (2014) 416 in *Biol Trace Elem Res.*
8. *World J Gastroenterol* 20 (2014) 8082; H. Cichoż-Lach and A. Michalak.
9. The following individuals: R. Ebabe Elle, Gaillet, J. Vide, C. Romain, C. Lauret, N. Rugani, J.P.
10. *J Neurol Sci* 331 (2013) K.P. Kuruvilla, Nandhu, J. Paul, and C.S. Paulose
11. P. Muriel, *Hepatol Int.* 3, 526 (2009)
12. H. Jaeschke, *Gastroenterol. Hepatol.*, 26 Suppl. 1, 173 (2011).

13. H. Jaeschke / *Journal of Gastroenterology and Hepatology* 26 Suppl 1 (2011) 173.
14. U. Gaharwar and R. Paulraj in *J. Biomed. Science and Engineering*, vol. 8, no. 274 (2015)
15. M. Ahamed, J. Alam, M.A. Khan, D. Ali, and S. Alarafi / *Curr Pharm Des* 19 (2013) 6681.
16. The following individuals: A. Aires, S. M. Ocampo, B. M. Simoes, M. Josefa Rodriguez, J. Cadenas, P. Couleaud, K. Spence, A. Latorre, R. Miranda, A. Somoza, R. B. Clarke, J. Carrascosa, and A. L. Cortajare
17. *J Nanomed Res* 3 (2016) 00071; V. Alan, C. Isabel, Eugenia, G. Roberto, Coffey, and M. Mendez-Rojas.
18. J. Estelrich, E. Escribano, J. Queralt and M.A. Busquets // *Int J Mol Sci* 16 (2015) 8070.
19. *Biotechnol Adv* 33 (2015) 1162 K. Hola, Z. Markova, Zoppellaro, J. Tucek, and R. Zboril
20. *ACS Macro Lett* 4 (2015) 403, M.H. Hsiao, Q. Mu, Z.R. Stephen, C. Fang, and Zhang.
21. *Colloids Surf B Biointerfaces* 142 (2016) 290. J. Hwang, E. Lee, J. Kim, Seo, K.H. Lee, J.W. Hong, Gilad, H. Park, and J. Choi.
22. *Breast Cancer Res* 17 (2015) 66 S. Kossatz, J. Grandke, P. Couleaud, A. Latorre, A. Aires, K. Crosbie-Staunton, R. Ludwig, H. Dahringer, V. Ettelt, A. Lazaro-Carrillo, M. Calero, M. Sader, J. Courty, Y. Volkov, A. Prina-Mello, A. Villanueva, A
23. S. Balakumar, T. Devaki, B. Rajan, S. Sathish, and *Environ Toxicol Pharmacol* 39 (2015) 727
24. V. Jaikumar and K. Sathish Kumar, *Iran Pharm. Res.* 10, 415 (2011)
25. *Int J Pharm* 505 (2016) 271 H.I. Tong, Kang, Y. Shi, G. Zhou, and Y. Lu
26. *Int J Nanomedicine* 10 (2015) 6985. H. Unterweger, D. Subatzus, R. Tietze, C. Janko, M. Poettler, A. Stiegelschmitt, M. Schuster, C. Maake, A.R. Boccaccini, and C. Alexiou.
27. *J. Trace Elem Med Biol* 38 (2016) 53 V. Valdiglesias, N. Fernandez-Bertolez, Kilic, C. Costa, Costa, S. Fraga, M.J. Bessa, E. Pasaro, J.P. Teixeira, and B. Laffon
28. *Biomaterials* 29 (2008) 487 Chertok, B.A. Moffat, . David, F. Yu, C. Bergemann, B.D. Ross, and V.C. Yang
29. *Applied Surface Science* 281 (2013) 60 A. Marcu, S. Pop, Dumitrache, M. Mocanu, C.M. Niculite, Gherghiceanu, C. Lungu, C. Fleaca, R. Ianchis, A. Barbut, C. Grigoriu, and I. Morjan
30. *Nano Research* 6 (2013): R. Xing, Bhirde, S. Wang, X. Sun, G. Liu, Y. Hou, and X. Chen 1.
31. S. Dugalic, Pantic, and Nikolovski / *J Microsc* (2017) 268 (2017) 45.
32. S. Suzic, D. Nesic, Basta- Jovanovic, S. Pantic, Paunovic, M. Perovic, C. Cattani, I. Pantic, and J. Paunovic / *J Microsc* 252 (2013)

CHAPTER 25

TRACTION MICROGRIDS UNCONVENTIONAL HYBRID SYSTEM CONTROL

YOGESH SHIVAJI PAWAR

Research Scholar, Bhabha University, Bhopal
Madhyapradesh, India

Dr. ASHOK KUMAR JHALA

Associate Professor, Dept. of Electrical Engineering
Bhabha University, Bhopal, Madhyapradesh, India

Abstract

The power consumption of the Indian Railways is around 2.5 percent of the country's total electricity consumption. To reduce the consumption of electricity come from power plants. so, we Hybridizing (it consists of P.V. and wind turbine generators and battery storage units) the railway substations with hybrid energy sources based on renewable energy sources and storage units connected to a dc bus may be a solution to contribute to the partial independence of energy producers in the sector of traffic rail. This project proposes a versatile, self adaptive, autonomous and intelligent distributed generator connected to dc bus control by multi agent system.

Keywords: *Braking and tracking energy, Jade, Macsim JX, MATLAB Simulink, Multi Agent System (MAS), penalty costs, railway microgrid, renewable energy sources (RES).*

Introduction

The subscribed power exceeding cost weighing the energy bill of the railway networks actors; its reduction will undoubtedly alleviate this increase. The placement of a new dc substation and/or the existing dc substation upgrades are the solutions actually implemented. From an economic point of view, these solutions do not solve the problems related to the losses generated by the power routing from the substation to the trains running on the line. It also introduces other investment costs related to the transmission and distribution network. Moreover, in the case of their renewal or extension, if the substation is powered by fossil energy sources, the energy produced will have a direct impact on the environment and its cost will be high following the refraction of this type of energy source. Reducing the subscribed power, eliminating the voltage drop in the line due to the acceleration and leading to the subscribed power exceeding and avoiding the voltage rise due to the deceleration by consuming the total of their generative energy not recovered by the other trains in the line, are the main issues related to the traffic railway. Indeed, it can occur that the regenerative power exceeds the consumed power, or the regenerated power is far from the consumed power. The techniques of the energy recovery are listed. Authors have proposed an intelligent control to plan their generative energy recovery. In fact, the line voltage increase, occurring due to the regenerative braking energy, causes the damage of traction materials; also, their generative energy generates a bidirectional energy flow on the line. If it is not consumed, it can be exported to the main network. A configuration of the substation that respects the reversibility without modifying the actual infrastructure, the proximity to the trains' consumption and facilitating their generative energy. Consumption that it is not recovered by the circulating trains is proposed in our work. It consists of hybridizing the substation by a hybrid power generation system (HPGS) tied to a dc bus that is directly connected to the catenary as depicted in Fig. 1. It offers all services brought by the hybrid systems and does not require any changes in the existing architecture of the substation. Linking renewable energy sources (RES) and storage units to the dc bus, connected to the catenary, is the hybrid substation (HSS) studied in our work. It consists of a photovoltaic and wind turbine generators and battery storage units. Two RES from different nature are combined, to minimize their discontinuity and also to avoid their oversizing that can occur if only one source is available. Following their main characteristic, the RES supply the railway line incomplementarity. A storage unit such as the battery is tied to the RES. It provides the energy necessary to meet the peak power demand and consumes the excess of regenerative energy in the line thanks to the associated converter. Indeed the inter connection of the RES and the battery to a dc bus in the catenary can be

viewed as distributed generator (DG) that reduces the subscribed power thanks to the RES generation, provides the energy necessary during acceleration phases to suppress the subscribed power exceeding and eliminates the drop voltage in the line thanks to the battery discharge and the RES generation simultaneously, and avoids the voltage increase due to the deceleration process by consuming the energy excess, thanks to the battery charge. The trains will no more consume the energy needed for circulation only from the substation but from a judicious use of RES generated power P_{RES} , battery power $P_{Battery}$, and substation power $P_{Substation}$ thanks to the distributed energy management (DEM)

$$P_{trains} = P_{Substation} + P_{RES} + P_{Battery}$$

The integration of the distributed generation such as RES in the railway network should meet several technical constraints. The potential interest and the possibility of integrating RES in the railway substation have been studied where it was pointed out that in order to improve the efficiency and reliability of the system, hybridizing a stationary system based on RES in the traffic railway can only be achieved by thinking of an intelligent approach, because the maximum railway traffic consumption is rarely correlated with maximum RES production.

The HPGS consists of a multi source system with decentralized energy sources with different capacities and different generation. To derive all the benefits of the braking energy and to reduce the tracking energy cost and also in order to avoid disturbing traffic or the energy quality of the railway lines. The energy flow and information coming from each source should be controlled simultaneously while integrating the HPGS to the substation. That allows the judicious and effective use of each source. Therefore, a need for a DEM is raised. The objective of the proposed DEM is to design a reversible, active, intelligent, self-adaptive, and autonomous DG connected to the catenary. Thereby, a dc-bus distributed control where the HPGD is tied is required. Further more, the railway electrical network can be observed as a micro grid, because it is depicted as a chain of distributed loads when the trains are in acceleration mode and also as DGs when the trains are in deceleration mode. Having regard to this, a very sophisticated distributed dc-bus voltage control is highly recommended. This paper proposes DEM by multivalent system (MAS) to enable the implementation of a railway microgrid with HSS based on HPGS. MAS is extensively suggested as a suitable approach to manage complex distributed system such as the railway microgrid and it can give a solution to a distributed control scenario. A large number of studies regarding the distributed control applications have been developed by MAS technology. The subscribed power exceeding cost weighing the energy bill of the railway networks actors; its reduction will undoubtedly alleviate this increase. The penalty costs related to the railway reflect the system's adaptation to energy consumption. If the energy production covers consumption, there is no penalty, and then the penalty cost is zero. On the other hand, if there is a certain lack or excess of energy, the penalty cost C depends on the square of the missing or surplus energy. In the proposed railway microgrid, penalty costs are related to the integration of intermittent energy sources as RES and to the balance between supply and demand and the subscribed power exceeding. The penalty costs associated with the RES correspond to the risk of unavailability during peak periods; this cost is covered by the battery in association with the available RES. Concerning the penalty costs related to the balance between supply and demand, it corresponds to the acceleration and deceleration phases and to the surplus of the unused consumed energy as in the case where the RES are available while the trains running on the line are running with a constant traction speed or at the trains start or stop, where the trains speed running on the line is zero. The penalty cost associated with this excess energy is totally covered by the battery for reuse in the event of peak or acceleration phases. Finally, the penalty cost related to the subscribed power exceeding is covered simultaneously by the RES and the battery.

Railway Control by M.A.S.

The control of the railway microgrid follows the same principle of a power flow control in a dc bus the current flowing in the line reveals different possible scenarios; a train or several trains brake, or a train brake while others accelerate. Therefore, the average current represents the outcome of the various possible scenarios that may occur.

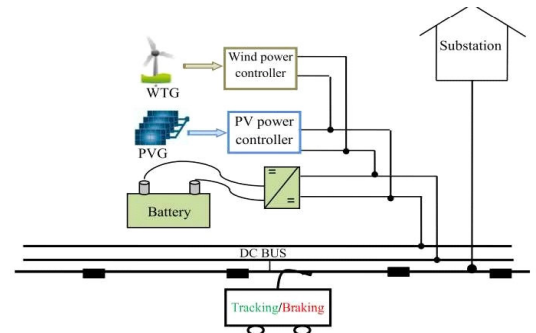
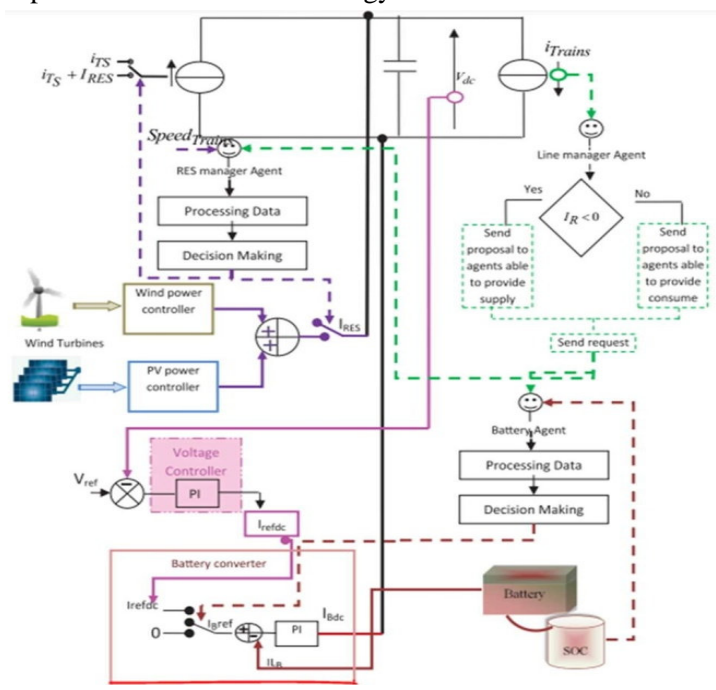


Fig. block diagram

It is viewed by the dc bus as reversible load. The positive resultant current expresses the acceleration phase and the negative resultant current represents the deceleration phase. The intelligence of the proposed control by MAS allows the battery to be charged from the RES generated power while trains are stopped and during deceleration periods, to reuse the stored energy during acceleration periods. It also allows the RES to reduce the subscribed power while the trains speed is constant. Using the Mactsim JX tool there are three agents that receive three Simulink signals. All the necessary calculations are carried out by Simulink while the decision making is performed by the agents in the Jade environment. The resulting current signal that informs about the various scenarios that may occur on the line is the input signal of the "line manager agent." The processing of these data by the agent indicates whether a request for energy supply is required, due to an acceleration in order to suppress the voltage drop on the line, or a consumption demand in order to remove the voltage increase due to deceleration is necessary. The "line manager agent" then sends this information to agents interested by this information and who can provide the supply or consumption of energy service to meet the acceleration and deceleration phases requirements. Actually, the agents are "battery agent" and "RES manager agent." On the other side, the "battery agent" receives from Simulink the signal indicating its state of charge (SOC). If the proposal of the "line manager agent" is correlated with the SOC, the "battery agent" accepts the proposal and begins to supply the energy needed during the acceleration which is not recovered. Maintaining the Integrity of the Specifications The template is used to format your paper and style the text. All margins, column widths, line spaces, and text fonts are prescribed; please do not alter them. You may note peculiarities. For example, the head margin in this template measures proportionately more than is customary. This measurement and others are deliberate, using specifications that anticipate your paper as one part of the entire proceedings, and not as an independent document. Please do not revise any of the current designations.

Study on Renewable Energy

Decentralized production means characterized by locating Energy production facilities closer to the site of energy consumption. Allows for more optimal use of renewable energy. Combined heat and power, reduce fossil fuel and increase eco-efficiency. the advantage of decentralized wind generation appears at maximizing incomes from the production with minimal impact on the power system. Two characteristics coming from the unpredictable climate, produce power. Automation of production of wind technology offers.



Uncontrollability on the generated production. Forecast established of the production 1 day early. We cannot give supply that comes directly from wind energy. It is difficult to anticipate electric production generated by wind turbines. Because forecasting tools are not designed to reproduce all variations of the wind. The models of forecast estimate the power by compiling the data and technical data of wind turbines. if the wind power generation is realized

one day early then production is 10%. Adding wind power to the power system is beneficial but it causes some problems like voltage dips or frequency variations. by this cost will increase. Wind turbines especially inductive machines absorb reactive power from the system and produce a low power factor. If the wind turbine absorbs too much reactive power, the system become unstable. The wind turbine affects voltage depending upon the weather. Fixed: voltage is not affected because the ratio is fixed. Variable: Reactive power affect voltage. Some factors contribute to voltage flicker in wind turbine aero dynamics, short circuit power, no. Of turbines, types of the control system. For solution we can connect these turbines to transmission and distribution high voltage grid or connect energy storage. We need a wind farm because only one windturbine will not give proper output. For greater efficiency of the system. It should store energy during high wind speed and restore when there is no wind.

Multi-Agent System

It is developed to control energy flow. M.A.S. is adaptive, self-aware, semi-autonomous, or autonomous. There are four types of agents:

- 1) Facilitator agent
- 2) Busagent
- 3) Loadagent
- 4) Distributed generator agents

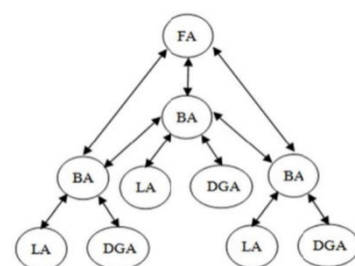
Facilitator Agent: It act as a decision making manager, it designed to respond to an upstream fault.

Busagent: It co-ordinate between F.A. and L.A. it designed to find post-fault. By interacting with its L.A., D.G.A. and monitor busparameters.

Load agent: L.A. monitors load parameters. During outage not enough power available then B.A. will send a control signal to L.A. to secure load by load shedding.

Distributed generator agents: It provide information to its B.A. during outage B.A. negotiate with its corresponding

D.G.A. and see there is enough power for load.



Simulated Result

Two Configurations are Studied

Railway line when D.G. is generated and aims to show the reaction of hybrid system tied to dc bus which is viewed as D.G. in different cases. Validates the strategy of energy management by M.A.S. and take full advantage of the capacity, characteristics, and limitations of each element in H.S. following a driving cycle scenario. The objective is to improve the efficiency and energy quality of the whole system by energy flow distribution and intelligent control.

Conclusion

This paper deals the DEM by MAS in the railway microgrid with HSS based on HPGS to meet the limitations of rail transportation systems in terms of energy saving. The HPGS consists of a multisource system with decentralized energy sources with different capacities and a different generation; therefore, judicious use and integration of each element were respected. Reducing the subscribed power, eliminating the voltage drop in the line due to the acceleration and leading to the subscribed power exceeding and avoiding the voltage rise due to the deceleration by consuming the total of there generative energy not recovered by the other trains in the line, remain the main issues that should be taking into account while hybridizing the substation without modifying the existing architecture. Thereby, this paper meets the mentioned limitations and constraints by designing reversible, active, intelligent, self-adaptive, and autonomous DG connected to the catenary thanks to the distributed dc-bus voltage control by MAS. It was shown the ability of the proposed control to reduce the subscribed power and to omit the subscribed power over run by the RES generation and the storage system which is represented by the battery. The penalty costs related to the subscribed power exceeding and the RES intermittence and also to the acceleration and deceleration were suppressed, thanks to the simultaneous control of the battery with the generation of the RES. The results also showed the stability and continuity of the system thanks to the effectiveness of the proposed control.

References

1. R.R. Pecharroman, A.Lopez-Lopez, A.P. Cucala, and A. Fernandez Cardador, "Riding the rails to DC power efficiency: Energy efficiency in dc-electrified metropolitan railways," *IEEE Electrific. Mag.*, vol. 2, no. 3, pp. 32–38, Sep. 2014.
2. S. Boudoudouh and M. Maaroufi, "Smart controlina DC railway by ^ multi agent system (MAS)," in *Proc. Int. Conf. Elect. Syst. Aircr. Railway Ship Propulsion Road Veh. Int. Transp. Electrific. Conf.*, 2016, pp.1–6.
3. Hajizadeh and M. A. Golkar, "Intelligent power management strategy of hybrid distributed generation system," *Int. J. Elect. Power Energy Syst.*, vol. 29, pp. 783–795, 2007.
4. H. Ibrahim et al., "Integration of wind energy into electricity systems: Technical challenges and actual solutions," *Energy Proceedia*, vol. 6, pp. 815–824, 2011.
5. B.Robyns et al., *Electricity Production from Renewables Energies*. New York, NY, USA: Wiley 2012.
6. M. Alvarez-Herault, "Architectures of the distribution future networks in the presence of decentralized production," Ph.D. dissertation, Univ. Grenoble, Grenoble, France, 2009.
7. R. Faranda and S.Leva, "Energetic sustainable development of railway stations," in *Proc. IEEE Power Eng. Soc. Gen. Meeting*, Tampa, FL, USA, 2007, pp.1–6.
8. H. Hayashiya et al., "Necessity and possibility of smart grid technology application on railway power supply system," in *Proc.14th Eur. Conf. Power Electron. Appl.*, Bermingham, U.K., 2011, pp. 1–10.
9. W. Khamphanchai, M. Pipattanasomporn, and S. Rahman, "A multi-agent system for restoration of an electric power distribution network with local generation," in *Proc. IEEE Power Energy Soc.Gen. Meeting*, 2012, pp.1–8.
10. W. Khamphanchai, M. Kuzlu, and M. Pipattanasomporn, "A smart distribution transformer management with multi agent technologies," in *Proc. IEEE PES Innov. Smart Grid Technol.Conf.*, 2013, pp.1–6.
11. D.E.Olivares, C.A. Canizares, and M.A. Kazerani, "A centralized optimal energy management system for micro grids," in *Proc. IEEE Power Energy Soc.Gen.Meeting*, Jul. 2011, pp.1–6.
12. H. Etemadi, E. J. Davison, and R. Iravani, "A decentralized robust control strategy for multi-DER microgrids—Part I: Fundamental concepts," *IEEE Trans. Power Del.*, vol. 27, no. 4, pp. 1843–1853, Oct. 2012.
13. L. Kulasekera et al., "A review on multi-agent systems in microgrid applications," in *Proc. IEEE PES Conf. Innov. Smart Grid Technol.India*, Kerala, India, Dec.1–3, 2011, pp. 173–177.
14. S. Boudoudouh, M. Ouassaid, and M. Maaroufi, "Multi agent system ^ in a distributed energy management of a multi sources system with a hybrid storage," in *Proc. 3rd Int. Renewable Sustain. Energy Conf.*, 2015, pp. 1–6.
15. S. Boudoudouh and M. Maaroufi, "Real time battery state of charge estimation in smart grid application by multiagent system," *Int. J. Hydrogen Energy*, vol. 42, pp. 19487–19495, 2017.
16. S.Boudoudouh and M.Maaroufi, "Real time distributed systems modeling and control: Application to photo voltaic fuel cell electrolyser system," *J.Eng.Sci.Technol.Rev.*, vol.10, no.1, pp.10–17,2017.
17. F.L.Bellifemine, G. Caire, and D.Greenwood, *Developing Multi Agent Systems with JADE*. NewYork, NY, USA: Wiley, 2007.

CHAPTER 26

OXIDATIVE STRESS RESPONSES IN PLANTS

MOHANO BEHARA

Department of Botany, P.V.K.N.Government College (Autonomous), Chittoor, A.P.

SAIVENKATESH KORLAM

Department of Botany, Government Degree College, Puttur, Tirupati Dt. A.P.

Abstract

Oxidative stress is a physiological condition caused by environmental stressors, leading to an imbalance between reactive oxygen species (ROS) and antioxidants. This can lead to reduced growth, altered development, and even death. To protect against oxidative stress, plants produce antioxidants, such as ascorbic acid, glutathione, and tocopherols, which are regulated by genes and can be enhanced through genetic engineering. Oxidative stress in plants is a complex phenomenon that occurs when there is an imbalance between the production of reactive oxygen species (ROS) and the plant's antioxidant defense system. To combat this, plants have developed strategies such as superoxide dismutase, catalase, and peroxidase to convert ROS into less harmful compounds, as well as non-enzymatic molecules like carotenoids, flavonoids, and phenolics to scavenge ROS. These compounds can be produced by plants themselves or acquired through the diet.

Oxidative stress is a challenge for plant growth and development, but researchers can develop strategies to enhance the stress tolerance of crops. Potential solutions include beneficial microbes and the development of stress-resistant cultivars. Further research is needed to understand the mechanisms and identify new targets for improving plant resistance.

Keywords: *Oxidative stress, antioxidants, reactive oxygen species, non-enzymatic molecules, stress-resistant cultivars*

Introduction

Oxidative stress is a physiological condition that occurs when plants are exposed to environmental stressors, such as heat, drought, or exposure to chemicals, that lead to an imbalance between reactive oxygen species (ROS) and antioxidants. This imbalance results in the accumulation of ROS, which causes damage to cellular components such as lipids, proteins, and DNA. ROS include superoxide anion, hydrogen peroxide, and hydroxyl radicals, which are formed during normal metabolic processes, including respiration and photosynthesis. In plants, oxidative stress can lead to reduced growth, altered development, and even death. Therefore, understanding the mechanisms that regulate ROS and antioxidant levels is crucial for the development of stress-resistant crops.

One of the ways in which plants defend themselves against oxidative stress is through the production of antioxidants. Antioxidants are compounds that scavenge ROS and prevent them from causing damage. Plants produce a range of antioxidants, including ascorbic acid, glutathione, and tocopherols. The production of these compounds is regulated by genes that are activated in response to stress, and they can be enhanced through genetic engineering.

Research has shown that the production of antioxidants can be improved through the use of beneficial microbes. For example, the fungus *Trichoderma harzianum* has been shown to increase the activity of antioxidant enzymes in plants exposed to salinity stress (Javed et al., 2020). Similarly, the bacterium *Bacillus subtilis* has been shown to enhance the production of ascorbic acid in tomato plants (Ma et al., 2021). These studies suggest that the use of beneficial microbes could be a promising strategy for enhancing the antioxidant capacity of crops.

In addition to the production of antioxidants, plants have developed other mechanisms to regulate ROS levels. For example, plants can use enzymes such as superoxide dismutase, catalase, and peroxidase to convert ROS into less harmful compounds. Plants can also use non-enzymatic molecules such as carotenoids, flavonoids, and phenolics to scavenge ROS. These compounds can be produced by plants themselves or acquired through the diet.

Oxidative stress in plants is a complex phenomenon that occurs when there is an imbalance between the production of reactive oxygen species (ROS) and the plant's antioxidant defense system. ROS are highly reactive molecules that can damage important biomolecules such as DNA, proteins, and lipids, and thus can have a significant impact on plant growth and development. In this article, we will explore the causes and consequences of oxidative stress in plants and examine some of the strategies plants have evolved to cope with this stress.

Causes of Oxidative Stress in Plants

Oxidative stress is a common physiological phenomenon in plants, occurring when the balance between reactive oxygen species (ROS) production and scavenging is disrupted, leading to an accumulation of ROS that can cause cellular damage.

ROS are generated in plant cells as a normal part of metabolism and are produced by various enzymes, including NADPH oxidases, peroxidases, and superoxide dismutases. However, the production of ROS can increase under conditions of abiotic or biotic stress, such as exposure to high light intensity, high temperatures, drought, salt stress, heavy metals, and pathogens. These stresses can damage the photosynthetic apparatus, alter membrane properties, and interfere with metabolic processes, leading to the production of excess ROS.

Oxidative stress is a phenomenon in which an imbalance occurs between the production of reactive oxygen species (ROS) and antioxidant defense mechanisms in cells. Plants are constantly exposed to various environmental stressors that can cause oxidative stress, including high light intensity, drought, high salinity, heavy metals, pathogens, and pollutants.

The following are some of the causes of oxidative stress in plants:

High light intensity:

Excessive exposure to light, particularly ultraviolet (UV) radiation, can generate high levels of ROS and cause oxidative stress in plants. This can lead to the degradation of photosynthetic pigments and membranes, which ultimately affects plant growth and development. (Ramel et al., 2013)

Drought stress:

Drought stress is a common environmental stress that can cause oxidative stress in plants by decreasing the water content of cells and tissues. This can lead to the production of ROS and the accumulation of oxidative damage in plant cells. (Zhang et al., 2016)

High Salinity:

Salinity stress can also cause oxidative stress in plants by altering ion homeostasis, leading to the production of ROS and oxidative damage in cells. (Munns and Tester, 2008)

Heavy metals:

Exposure to heavy metals, such as lead, cadmium, and copper, can cause oxidative stress in plants by disrupting the balance of antioxidant defense mechanisms and increasing ROS production. (Gill and Tuteja, 2010)

Pathogens:

Pathogen infection can trigger the production of ROS in plant cells, leading to oxidative stress and the activation of defense mechanisms. (Bolwell et al., 2002)

Pollutants:

Exposure to pollutants, such as herbicides and pesticides, can also cause oxidative stress in plants by disrupting cellular metabolism and inducing the production of ROS. (Gill and Tuteja, 2010)

Environmental stress:

Plants are exposed to various environmental stressors such as high light, high temperature, drought, salinity, heavy metals, pollutants, and pathogen attack. These stressors can induce ROS production in the plant cells, leading to oxidative stress (Sharma et al., 2012).

Metabolic stress:

Plant metabolic processes such as respiration, photosynthesis, and the biosynthesis of secondary metabolites also generate ROS as by-products. Increased metabolic activity, such as during periods of growth or when plants are under nutrient stress, can lead to an accumulation of ROS (Foyer & Noctor, 2013).

Genetic factors: Genetic factors such as mutations or alterations in antioxidant enzymes can also contribute to oxidative stress in plants. For instance, mutations in genes encoding for superoxide dismutase (SOD) enzymes can result in increased ROS accumulation (Noctor et al., 2002).

Aging:

As plants age, the efficiency of their antioxidant defense system decreases, making them more susceptible to oxidative stress (Mittler, 2002).

UV radiation:

Ultraviolet (UV) radiation can also lead to oxidative stress in plants by inducing the production of ROS, damaging the photosynthetic machinery, and altering the plant's antioxidant defense system (Hideg et al., 2013).

Consequences of Oxidative Stress in Plants

The accumulation of excess ROS can lead to cellular damage and even cell death. ROS can damage important biomolecules such as DNA, proteins, and lipids, leading to mutations, denaturation, and oxidation. In addition, ROS can affect the function of enzymes, leading to decreased metabolic activity and altered cellular signaling pathways. ROS can also disrupt membrane integrity, leading to leakage of ions and metabolites, and alter the function of transport proteins. The cumulative effect of these changes can lead to reduced plant growth and yield, as well as increased susceptibility to biotic and abiotic stress.

Oxidative stress is a condition that occurs when the production of reactive oxygen species (ROS) exceeds the antioxidant defense mechanisms in cells. ROS are highly reactive molecules that can damage cellular components such as lipids, proteins, and nucleic acids. In plants, oxidative stress can occur due to a variety of factors including environmental stressors such as drought, high salinity, and extreme temperatures, as well as biotic stressors such as pathogens and pests. The consequences of oxidative stress in plants can be severe and can include:

Damage to cell membranes:

ROS can cause lipid peroxidation, which damages the integrity of cell membranes. This can result in increased permeability, loss of important cellular components, and ultimately, cell death (Foyer & Noctor, 2013).

Inhibition of photosynthesis

ROS can also damage the photosynthetic machinery in plants, resulting in reduced photosynthetic efficiency and decreased plant growth (Asada, 1999).

DNA damage:

ROS can also cause damage to DNA, resulting in mutations and genomic instability. This can ultimately lead to cell death or the development of diseases such as cancer (Gill & Tuteja, 2010).

Activation of programmed cell death:

In some cases, oxidative stress can trigger programmed cell death in plants. This is a process called apoptosis, which is used by plants to remove damaged or diseased cells (Bhattacharjee, 2005).

Decreased plant fitness:

Overall, oxidative stress can decrease plant fitness by reducing growth, reproduction, and survival (Mittler, 2002).

Strategies to Cope with Oxidative Stress in Plants

Oxidative stress is a condition that occurs when the balance between the production of reactive oxygen species (ROS) and antioxidant defence mechanisms is disrupted in plants. ROS are natural by-products of cellular metabolism, and their accumulation can lead to oxidative damage to cellular components such as DNA, lipids, and proteins. Plants have evolved several strategies to cope with oxidative stress, including the production of antioxidant enzymes, non-enzymatic antioxidants, and the modulation of signalling pathways. Here are some of the strategies that plants use to cope with oxidative stress:

Stress causes an active response in plants, which brings changes in its metabolomics, like formation of compatible solutes, antioxidants, phytoalexins, protein protectants and cryoprotectants often due to up-regulation of metabolic pathways. (Bohnert and Shen, 1999)

Production of antioxidant enzymes:

Plants produce several antioxidant enzymes, such as superoxide dismutase (SOD), catalase (CAT), and peroxidase (POD), which help to neutralize ROS. SOD converts superoxide radicals to hydrogen peroxide (H₂O₂), which is then further metabolized by CAT and POD. Studies have shown that the overexpression of SOD, CAT, and POD genes can improve plant tolerance to oxidative stress (Shalata and Mittova, 2008).

Non-enzymatic antioxidants

Plants also produce non-enzymatic antioxidants such as ascorbic acid (vitamin C), glutathione (GSH), and tocopherols (vitamin E), which help to scavenge ROS. These compounds act as electron donors and can neutralize ROS directly or indirectly by regenerating other antioxidants (Foyer and Noctor, 2011).

Modulation of signaling pathways:

Plants can also modulate signaling pathways to cope with oxidative stress. For example, the mitogen-activated protein kinase (MAPK) signaling pathway has been shown to be involved in plant responses to oxidative stress. The activation of MAPKs can lead to the expression of genes involved in antioxidant defense and stress tolerance (Khan et al., 2018).

Phytohormones:

Several phytohormones, such as abscisic acid (ABA), salicylic acid (SA), and jasmonic acid (JA), have been shown to play a role in plant responses to oxidative stress. ABA, for example, can help plants to conserve water during drought stress, which can reduce the production of ROS (Mittler and Blumwald, 2015).

Mechanism of tolerance of oxidative stress in plants:

Plants are exposed to various abiotic and biotic stress factors, including oxidative stress, which is characterized by an imbalance between the production of reactive oxygen species (ROS) and the ability of the plant to detoxify them. ROS, such as superoxide radicals, hydrogen peroxide, and hydroxyl radicals, are highly reactive molecules that can damage cellular components, including DNA, proteins, and lipids, leading to cell death and impaired plant growth and development. To cope with oxidative stress, plants have developed a range of defense mechanisms, including enzymatic and non-enzymatic antioxidants, ROS-scavenging systems, and signaling pathways that regulate gene expression and cellular responses.

Plants have evolved various mechanisms to cope with oxidative stress caused by the accumulation of reactive oxygen species (ROS) such as superoxide anion (O²⁻), hydrogen peroxide (H₂O₂), and hydroxyl radical (OH[•]) in response to different abiotic and biotic stress factors. These mechanisms include enzymatic and non-enzymatic antioxidant systems, ROS-scavenging molecules, and repair systems. Here are some key mechanisms of tolerance of oxidative stress in plants:

Enzymatic antioxidant system:

This system involves the action of various enzymes such as superoxide dismutase (SOD), catalase (CAT), ascorbate peroxidase (APX), glutathione peroxidase (GPX), and peroxiredoxin (Prx) which play crucial roles in scavenging ROS and maintaining cellular redox homeostasis. For example, SOD converts O₂⁻ into H₂O₂, which is further metabolized by CAT and APX to water and oxygen.

Non-enzymatic antioxidant system:

This system involves the action of various small molecules such as ascorbate (AsA), glutathione (GSH), tocopherols (vitamin E), carotenoids, flavonoids, and phenolic compounds. These molecules can scavenge ROS directly or indirectly, and also play important roles in maintaining the redox state of the cell.

ROS-scavenging molecules:

Certain small molecules such as melatonin, salicylic acid, and jasmonic acid have been reported to directly scavenge ROS or induce the expression of antioxidant enzymes and molecules in plants.

Repair systems:

Repair mechanisms include the action of DNA repair enzymes, chaperones, and proteases that help in the repair and degradation of damaged proteins and other cellular components caused by oxidative stress.

Overall, the coordination of these mechanisms is crucial for the tolerance of oxidative stress in plants. The understanding of these mechanisms has been reviewed in several articles (Baxter et al., 2014; Gill and Tuteja, 2010; Mittler, 2002).

Oxidative stress responses in plants with references

Oxidative stress is a state where an imbalance between reactive oxygen species (ROS) production and antioxidant defenses occurs, resulting in cellular damage. Plants, like other organisms, have evolved various mechanisms to counteract oxidative stress. Here are some examples of oxidative stress responses in plants.

ROS scavenging enzymes:

Plants have several enzymes that can scavenge ROS, including superoxide dismutase (SOD), catalase (CAT), and ascorbate peroxidase (APX). These enzymes play a crucial role in protecting plants from oxidative damage.

Non-enzymatic antioxidants:

Plants also possess non-enzymatic antioxidants such as ascorbic acid (vitamin C), glutathione, and tocopherols. These compounds help to neutralize ROS and protect plant cells from oxidative damage.

ROS signaling:

ROS are not only harmful molecules but also act as signaling molecules in plants. They can modulate gene expression, activate stress-responsive pathways, and induce programmed cell death.

Heat shock proteins (HSPs):

HSPs are a group of chaperones that help to maintain protein homeostasis under stress conditions. They are induced by oxidative stress and protect plants by stabilizing proteins and preventing their aggregation.

Secondary metabolites:

Some secondary metabolites, such as flavonoids, phenolics, and carotenoids, act as antioxidants and can help to scavenge ROS. They are synthesized in response to oxidative stress and protect plants from damage.

Conclusion

Overall, oxidative stress is a significant challenge for plant growth and development, particularly in the context of climate change and increasing demand for food. However, by understanding the mechanisms that regulate ROS and antioxidant levels, researchers can develop strategies to enhance the stress tolerance of crops. The use of beneficial microbes and the development of stress-resistant cultivars are just two examples of potential solutions. Further research is needed to fully understand the complex interplay between ROS and antioxidants in plants, but the promise of stress-resistant crops offers hope for a more sustainable future.

Oxidative stress is a common phenomenon in plants that can have significant impacts on plant growth and development. Plants have evolved various strategies to cope with this stress, including the production of antioxidant enzymes and non-enzymatic antioxidants, as well as the adjustment of metabolic pathways to reduce the production of ROS. Further research is needed to fully understand the mechanisms underlying these strategies and to identify new targets for improving plant resistance to oxidative stress.

In conclusion, oxidative stress is a significant challenge for plants, particularly in light of the increasing frequency of environmental stresses. However, the activation of antioxidant defense systems and signaling pathways has

provided insight into how plants cope with oxidative stress. Continued research in this area is crucial for developing strategies to mitigate the effects of oxidative stress and improve plant growth and productivity.

References

1. Asada, K. (1999). The water-water cycle in chloroplasts: Scavenging of active oxygen and dissipation of excess photons. *Annual Review of Plant Biology*, 50(1), 601-639.
2. Baxter, A., Mittler, R., and Suzuki, N. (2014). ROS as key players in plant stress signalling. *Journal of Experimental Botany*, 65(5), 1229-1240.
3. Bhattacharjee, S. (2005). Reactive oxygen species and oxidative burst: Roles in stress, senescence and signal transduction in plants. *Current Science*, 89(7), 1113-1121.
4. Bohnert, H.J. and Shen, B. (1999). Transformation and compatible solutes. *Sci.Hortic.* 78,237-260.
5. Bolwell, G. P., Bindschedler, L. V., Blee, K. A., Butt, V. S., Davies, D. R., Gardner, S. L., Gerrish, C., Minibayeva, F., and Rowntree, E. G. (2002). The apoplastic oxidative burst in response to biotic stress in plants: a three-component system. *Journal of Experimental Botany*, 53(372), 1367-1376.
6. Bors, W., Heller, W., Michel, C., & Saran, M. (1990). Flavonoids as antioxidants: determination of radical-scavenging efficiencies. *Methods in Enzymology*, 186, 343-355.
7. Foyer, C. H., & Noctor, G. (2011). Ascorbate and glutathione: the heart of the redox hub. *Plant Physiology*, 155(1), 2-18.
8. Foyer, C. H., & Noctor, G. (2013). Redox signaling in plants. *Antioxidants & Redox Signaling*, 18(16), 2087-2090.
9. Gill, S. S., & Tuteja, N. (2010). Reactive oxygen species and antioxidant machinery in abiotic stress tolerance in crop plants. *Plant Physiology and Biochemistry*, 48(12), 909-930.
10. Hideg, É., Jansen, M. A., & Strid, Å. (2013). UV-B exposure, ROS, and stress: inseparable companions or loosely linked associates? *Trends in plant science*, 18(2), 107-115.
11. Javed, M. T., Ahmad, M., Bukhari, M. A., Ali, Q., Nafees, M., & Iqbal, M. (2020). *Trichoderma harzianum*-induced alterations in ROS-scavenging and antioxidant enzymatic activities enhance salt stress tolerance in maize. *Journal of plant growth regulation*, 39(3), 933-947.
12. Khan, M. I. R., Khan, N. A., & Ferrante, A. (2018). Plant responses to abiotic stress: focus on the contribution of MAPK signaling pathways. *Biologia Plantarum*, 62(2), 195-208.
13. Ma, Y., Wang, D., Wang, C., Xu, X., Chen, Y., Huang, J., & Chen, J. (2021). *Bacillus subtilis* enhances the antioxidant capacity of tomato fruit by regulating the ascorbate-glutathione cycle. *Postharvest Biology and Technology*, 173, 111416.
14. Mittler, R. (2002). Oxidative stress, antioxidants and stress tolerance. *Trends in Plant Science*, 7(9), 405-410.
15. Mittler, R., & Blumwald, E. (2015). The roles of ROS and ABA in systemic acquired acclimation. *Plant, Cell & Environment*, 38(3), 606-619.
16. Munns, R., and Tester, M. (2008). Mechanisms of salinity tolerance. *Annual Review of Plant Biology*, 59, 651-681.
17. Noctor, G., Veljovic-Jovanovic, S., & Foyer, C. H. (2002). Peroxide processing in photosynthesis: antioxidant coupling and redox signalling. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, 357(1426), 1441-1451.
18. Prasad, T. K., Anderson, M. D., & Stewart, C. R. (1994). Acclimation, Hydrogen Peroxide, and Abscisic Acid Protect Mitochondria against Irreversible Chilling Injury in Maize Seedlings. *Plant Physiology*, 105(2), 619-627.
19. Ramel, F., Birtic, S., Cuiné, S., Triantaphylidès, C., and Ravanat, J. L. (2013). Chemical quenching of singlet oxygen by carotenoids in plants. *Plant Physiology*, 162(1), 977-986.
20. Shalata, A., & Mittova, V. (2008). The role of ROS and antioxidants in stress signaling in plants. In *Annual Plant Reviews Volume 26: Senescence Processes in Plants* (pp. 201-238). Wiley-Blackwell.

21. Sharma, P., Jha, A. B., Dubey, R. S., & Pessarakli, M. (2012). Reactive oxygen species, oxidative damage, and antioxidative defense mechanism in plants under stressful conditions. *Journal of botany*, 2012.
22. Suzuki, N., Koussevitzky, S., Mittler, R., & Miller, G. (2012). ROS and redox signaling in the response of plants to abiotic stress. *Plant, Cell & Environment*, 35(1), 259-270.
23. Wang, W., Vinocur, B., & Altman, A. (2003). Plant responses to drought, salinity and extreme temperatures: towards genetic engineering for stress tolerance. *Planta*, 218(1), 1-14.
24. Xie, Z., Zhang, Z., Hanzlik, S., Cook, E., & Shen, Q. J. (2011). Salicylic acid inhibits gibberellin-induced alpha-amylase expression and seed germination via a pathway involving an abscisic-acid-inducible WRKY gene. *Plant molecular biology*, 77(1-2), 195-206.
25. Zhang, Y., Liu, J., and Yang, X. (2016). Overexpression of SIMAPK3 enhances tolerance to drought stress in tomato plants by regulating ROS production and stomatal closure. *Frontiers in Plant Science*, 7, 1706.

CHAPTER 27

MICROALGAE IN PHYCOREMEDIATION: AN OVERVIEW OF THE POTENTIAL AND APPLICATIONS

SUJANA PAPANI¹

¹Department of Botany, P.V.K.N. Government College (Autonomous), Chittoor, A.P.

SAIVENKATESHKORLAM²

²Department of Botany, Government Degree College, Puttur, Tirupati Dt. A.P.

Abstract

Phycoremediation is a promising technology that utilizes microalgae to remove pollutants from wastewater, industrial effluents, and other contaminated environments. Microalgae are known for their high photosynthetic efficiency, rapid growth, and ability to absorb and metabolize various pollutants such as heavy metals, nutrients, and organic compounds. This review aims to provide an overview of the potential and applications of microalgae in phycoremediation, including the mechanisms of pollutant removal, the factors affecting microalgae growth and performance, and the current state of research in this field. We also discuss the challenges and opportunities of using microalgae for environmental remediation and highlight the need for further research to optimize their use in phycoremediation.

Keywords: *Phycoremediation, microalgae, heavy metals, nutrients, and organic compounds*

Introduction

The increasing pollution of our water resources has become a major environmental and public health concern worldwide. Traditional wastewater treatment methods have limitations in removing emerging contaminants such as microplastics, pharmaceuticals, and other persistent organic pollutants. Phycoremediation, the use of microalgae to remove pollutants from wastewater, industrial effluents, and other contaminated environments, has emerged as a promising alternative to traditional methods. Microalgae are unicellular photosynthetic organisms that can grow in a wide range of environments and conditions. They have several advantages over other organisms such as bacteria and fungi, including their high photosynthetic efficiency, fast growth rate, and ability to metabolize various pollutants.

Microalgae are unicellular or multicellular microscopic organisms that can carry out photosynthesis and convert carbon dioxide and sunlight into biomass. They are found in diverse habitats, including freshwater, marine, and terrestrial environments, and exhibit a high degree of biodiversity. Microalgae are known to possess a range of metabolic pathways that allow them to metabolize various pollutants, such as nitrogen, phosphorus, heavy metals, organic compounds, and even radioactive substances. These metabolic pathways make microalgae excellent candidates for phycoremediation, as they can effectively remove pollutants from wastewater, agricultural runoff, and other contaminated water sources. Microalgae are photosynthetic microorganisms that are capable of removing pollutants from wastewater, a process known as phycoremediation. Phycoremediation is a promising alternative to conventional wastewater treatment methods due to its environmental sustainability, economic feasibility, and potential for producing valuable biomass and biofuels.

Phycoremediation is a promising and eco-friendly technology that uses microalgae to remove pollutants from various environments such as wastewater, industrial effluents, and agricultural runoff. Microalgae are photosynthetic microorganisms that can be easily cultured and have the ability to sequester various pollutants such as heavy metals, organic compounds, and nutrients from the environment. The present review aims to highlight the importance of microalgae in phycoremediation with a focus on the potential of microalgae to remove various pollutants from different environments.

Mechanisms of pollutant removal

Microalgae can remove pollutants from contaminated water by several mechanisms. They can absorb pollutants through their cell membranes or by active transport mechanisms, such as ion pumps and carriers. Once inside the cell, microalgae can metabolize pollutants through various pathways, including oxidation, reduction, and hydrolysis.

Microalgae can also remove pollutants by bioaccumulation, which is the process of accumulating pollutants in the cell without metabolizing them. The mechanisms of pollutant removal by microalgae depend on the type of pollutant and the physiological state of the microalgae.

Factors affecting microalgae growth and performance

Several factors can affect the growth and performance of microalgae in phycoremediation. These include nutrient availability, light intensity and quality, temperature, pH, salinity, and the presence of other microorganisms. Nutrient availability, particularly nitrogen and phosphorus, is essential for microalgae growth and biomass production. Light intensity and quality are critical for photosynthesis, and inadequate light can limit the growth of microalgae. Temperature, pH, and salinity can affect the physiological state and metabolism of microalgae, and extreme conditions can inhibit their growth and performance. The presence of other microorganisms, such as bacteria and fungi, can also affect the growth and performance of microalgae by competing for nutrients and space or by producing allelopathic compounds that inhibit their growth.

Applications of microalgae in phycoremediation

Microalgae have several applications in phycoremediation, including the removal of nutrients, heavy metals, organic compounds, and emerging contaminants from wastewater and industrial effluents. Microalgae can also be used to treat other contaminated environments such as landfills, mine tailings, and oil spills. The harvested microalgal biomass can be used for several purposes, including biofuel production, animal feed, and fertilizer. Microalgae can also be used in combination with other treatment methods, such as activated sludge and membrane filtration, to enhance the removal of pollutants.

Microalgae have shown promising results in treating various types of wastewater, such as domestic, industrial, and agricultural wastewater. Some of the common applications of microalgae in phycoremediation are listed below:

a) Treatment of domestic wastewater:

Domestic wastewater contains high levels of nitrogen and phosphorus, which can be effectively removed by microalgae. The microalgae utilize these nutrients for their growth and remove them from the wastewater. The biomass produced during the growth of microalgae can be used as a biofertilizer.

b) Treatment of industrial wastewater:

Industrial wastewater contains heavy metals and organic compounds, which can be effectively removed by microalgae. The microalgae adsorb the heavy metals and convert the organic compounds into valuable biomass. The biomass produced during the growth of microalgae can be used as a biofuel.

c) Treatment of agricultural wastewater:

Agricultural wastewater contains high levels of nitrogen and phosphorus, which can be effectively removed by microalgae. The microalgae utilize these nutrients for their growth and remove them from the wastewater. The biomass produced during the growth of microalgae can be used as a biofertilizer.

d) CO₂ sequestration:

Microalgae are capable of fixing carbon dioxide from the atmosphere and utilizing it for their growth. The biomass produced during the growth of microalgae can be used as a biofuel, which can replace fossil fuels and reduce carbon emissions.

Several studies have demonstrated the effectiveness of microalgae in phycoremediation. For instance, in a study conducted by Park et al. (2011), the authors found that a mixed culture of microalgae and bacteria was able to remove up to 92% of nitrogen and 99% of phosphorus from wastewater. In another study, Bhattacharya et al. (2015) investigated the ability of microalgae to remove heavy metals from industrial wastewater and found that the microalgae were able to remove up to 90% of copper, zinc, and lead from the wastewater.

Furthermore, microalgae can also play a role in the production of biofuels and other value-added products, which can help to offset the costs of phycoremediation. For instance, microalgae can be used to produce biodiesel, biogas, and other biofuels, as well as high-value products such as pigments, omega-3 fatty acids, and antioxidants.

5. Challenges and opportunities

Despite the potential of microalgae in phycoremediation, several challenges need to be addressed to optimize their use. These include the high capital and operational costs of microalgae cultivation, the need

Recent advances in microalgae-based phycoremediation

Recent advances in microalgae-based phycoremediation have focused on improving the efficiency and scalability of the process. One promising approach is the use of genetically engineered microalgae that can express specific genes for pollutant removal. For example, researchers have developed genetically modified microalgae that can express metallothionein, a protein that binds to heavy metals and facilitates their removal from wastewater. Another approach is the use of photobioreactors, which allow for better control of environmental conditions such as light intensity, temperature, and nutrient supply. Photobioreactors can also be scaled up for industrial applications, making them a viable option for large-scale phycoremediation.

Conclusion

In conclusion, microalgae are a promising alternative to conventional wastewater treatment methods due to their ability to remove pollutants from wastewater, their potential for producing valuable biomass and biofuels, and their environmental sustainability and economic feasibility. The use of microalgae in phycoremediation has the potential to revolutionize the field of wastewater treatment and contribute to a more sustainable future.

Microalgae have significant potential as a sustainable and cost-effective alternative to traditional wastewater treatment technologies. Their ability to remove various pollutants from wastewater, as well as their potential for the production of biofuels and other value-added products, makes them a promising option for future phycoremediation research. Microalgae have great potential in phycoremediation due to their high growth rate, ability to adapt to different environmental conditions, and effectiveness in removing various pollutants. With the recent advances in microalgae-based phycoremediation, we can expect to see more widespread use of this technology for the treatment of contaminated water sources in the future.

References

1. Aslan S, Kapdan IK. Batch kinetics of nitrogen and phosphorus removal from synthetic wastewater by algae. *Ecol Eng.* 2006;28(1):64-70.
2. Bhatnagar, A., & Devi, P. (2019). Microalgae in wastewater treatment: current trends and applications. *Journal of environmental management*, 232, 1-14.
3. Bhattacharya, P., Lin, J., Turner, P., Keely, B., & Brown, M. T. (2015). Microalgal biomass for copper, lead and zinc removal from industrial wastewater. *Journal of Environmental Management*, 151, 160-166.
4. Chandra, R., Kumar, V., Singh, R. P., & Yadav, S. (2016). Phycoremediation of wastewater: a sustainable approach for pollution control. *Journal of environmental management*, 181, 351-363.
5. Chinnasamy S, Bhatnagar A, Hunt RW, Das KC. Microalgae cultivation in a wastewater dominated by carpet mill effluents for biofuel applications. *Bioresour Technol.* 2010;101(8):3097-3105.
6. Converti, A., Casazza, A. A., Ortiz, E. Y., Perego, P., & Borghi, M. D. (2009). Effect of temperature and nitrogen concentration on the growth and lipid content of *Nannochloropsis oculata* and *Chlorella vulgaris* for biodiesel production. *Chemical Engineering and Processing: Process Intensification*, 48(6), 114
7. Kamalanathan, M., & Venkata Mohan, S. (2019). Microalgae-mediated phycoremediation of wastewaters: a review on pollutant removal mechanisms and optimization strategies. *Journal of Water Process Engineering*, 29, 100827.
8. Mata TM, Martins AA, Caetano NS. Microalgae for biodiesel production and other applications: a review. *Renew Sustain Energy Rev.* 2010;14(1):217-232.
9. Mulbry, W., & Kondrad, S. (2012). Algae-based wastewater treatment. In *Handbook of Microalgal Culture* (pp. 515-535). John Wiley & Sons, Ltd.
10. Packer, M. A., Liaaen-Jensen, S., & Borowitzka, M. A. (2019). Algae: a sustainable and scalable approach for mitigating environmental pollution. *Algal Research*, 44, 101671.
11. Park, J. B., Craggs, R. J., Shilton, A. N., & Smith, S. V. (2011). Wastewater treatment high rate algal ponds for bioresource recovery. *Bioresource technology*, 102(1), 35-42.
12. Singh A, Bishnoi NR. Comparative study of microalgae for wastewater treatment and biofuel production. *J Environ Manage.* 2017;190:170-177.
13. Singh, P., Singh, R. P., & Singh, R. L. (2015). Microalgae: A promising tool for phycoremediation of wastewater. *Applied biochemistry and biotechnology*, 176(8), 2315-2333.
14. Wang L, Min M, Li Y, et al. Cultivation of green algae *Chlorella* sp. in different wastewaters from municipal wastewater treatment plant. *ApplBiochemBiotechnol.* 2010;162(4):1174-1186.

CHAPTER 28

DIFFICULTIES FACED BY ESL TERTIARY LEARNERS IN ENGINEERING COLLEGES OF ANDHRA PRADESH

Ms. V. SUJATHA

Assistant Professor, Department of Humanities and Sciences

Sri Venkateswara College of Engineering and Technology, RVS Nagar, Chittoor

Abstract

The main objective of this study is to identify the difficulties faced by ESL Tertiary learners in Engineering Colleges in Andhra Pradesh at Sri Venkateswara College of Engineering and Technology, RVS Nagar, Chittoor, and to make subsequent recommendations. The technique was to provide questionnaire to 30 tertiary students from I B.Tech Electronics and Communication Engineering discipline to obtain details of their main difficulties in learning English. The present study would investigate on the difficulties faced by ESL tertiary Learners in Sri Venkateswara College of Engineering and Technology, Andhra Pradesh and possible solutions for those difficulties by both in teachers point and in students point. The findings infer that, writing was generally thought to be the biggest problem area followed by speaking. Results also imply that the great majority of students do not study or practice English on a daily basis. This study concludes with recommendations for students to effectively participate in the language activities and to teachers to analyze the standards of the tertiary students to plan the activities accordingly.

Keywords: *Difficulties, ESL, Tertiary, mentor, vital, motivation.*

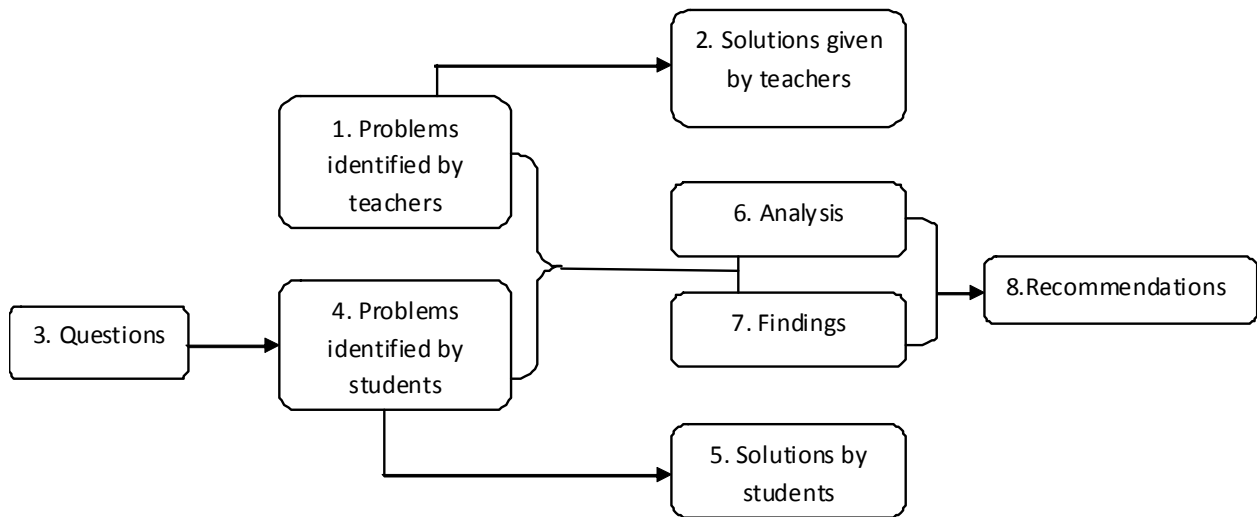
Introduction

Language is a weapon to communicate effectively. Through language one expresses ones emotions, ideas, thoughts and controls their day to day actions. Learning a regional language or a first language is far easier compared to leaning English as second language. The student is exposed to the first language right from his or her childhood and entire ambience is favorable in learning the native language. Whereas learning English as second language limits ones resources. The students are majorly dependent on their places of academic learning to enhance their English language skills. It requires more consciousness to acquire it. Hence the students face many difficulties and limitations. English has rapidly become a global language. No other language, either ancient or modern can be compared with English in respect of its international status. More recently its value and prominence has increased to a far greater degree due to globalization. There are a number of factors which affect the process of teaching-learning of English as a second language in India.

Literary Survey

While learning any language reading and listening are considered as receptive skills where as writing and speaking are the productive skills essential for the improvement of effective communication. Of all the four language skills (LSRW) speaking skill is the most important skill required for communication. The student's inability to communicate in English language is because of their family educational background that leads to late foundation of English medium studies build lack of vocabulary, sentence formation, create fear of speaking in English. (*Ganesh, D., Charyulu, G. M., & Hussain, S. S. (2019)*).The new methods are very helpful to overcome the students learning lapses ; with basic knowledge in English with the help of some electronic gadgets one can develop language skills perfectly. The most important thing is he/she can arrange English speaking environment in all areas where ever he goes. Make English part of your life at home, at work, during your free time. Read on to find tips that will help you overcome the difficulties you might be experiencing to improve your English language (SAGAR, B). The students with good communication skills and soft skills taste success with respect to carrer and placement option than those who lack such skills. Very often recruiters complain during their drives that about 50 % of students do not have employability skills.(*Gupta, D. (2013)*). Various obstacles regarding large number of students stuffed in small classroom, rural background, lack of confidence, lack of motivation, barrier of hesitation, lack of reading habits, phobia in the minds of learners, inappropriate curriculum that do not fulfill the requirements of English learners, lack of feedback and lack of trained and qualified teachers are some important factors that makes the entire process of implementing quality education futile. (*Kalia, P. (2017)*).

III. Research Design



Data Analysis

The researcher, as a teacher identified 15 general difficulties faced by the ESL tertiary learners of SVCET (A) College Chittoor, Andhra Pradesh in learning English as a Second language (ESL) and also prepared possible solutions for the same. The researcher framed questionnaires as a tool for data collection, such as the student’s place of birth, status of the place of birth (city/town/village), his/her age, medium of study till the previous course of study, 5 difficulties faced by them in learning English as second language (ESL) and 5 possible solutions for the same problems. The collected data of students’ opinions supported to processed to do further analysis. The researcher randomly selected 30 students who came from different rural areas to study engineering graduation in SVCET (A) College Chittoor, AP to do research experimentation. The difficulties of the students gathered in statistical method and to analyses, the data researcher used tables. The percentage of the respondents used to accumulates the results. Apart from this, researcher observed the students’ speaking abilities in the classroom

Problem Identification

S.No	Teacher	Student
1.	Grammatical mistakes in speaking and writing	Grammatical mistakes
2.	Lack of confidence in speaking English Language	Low confidence
3.	Stage fright	Stage fright
4.	Family educational background	Telugu medium background
5.	Fear of making mistakes	Pronunciation issue
6.	Nervousness to take part in activities	Sentence formation
7.	Peer pressure of finding errors	Speaking English is difficult
8.	Shyness in speaking English language	Shyness in speaking English language
9.	Lack of motivation in students in speaking English language	Disturbance from classmates
10.	Lack of vocabulary	Poor vocabulary power
11.	Poor listening skills of students	Cannot speak continuously
12.	No English speaking environment other than language classes	Low Comprehensive skills
13.	Lack of interest in enhancing their language skills	Nobody tries to speak in English with in the class room or within the campus.
14.	Students feel much comfortable in expressing their emotions in regional language	Very hard to translate emotions in English

15.	Students feel that English is just a subject and consider to clear the subject rather than to improve their English language skills.	Fear of talking in English
-----	--	----------------------------

Solutions Identified

Sl.No	Teacher	Student
1.	Provide a comfortable zone for students to participate actively in the class rooms activities	Watch videos with native speaker pronunciation
2	Create fun based activities	Insist to participate in fun based activities
3.	Motivate the students by persuading with the benefits of learning English language.	Motivate the students to speak in English
4.	Encouraging the students to overcome the stage fright by participating in short presentations and news paper reading	Participating in group activities actively
5.	Introducing every day 5 common vocabulary and motivating the students to use them in their day to day conversation	Interacting with New Peer, listening to English Audio books.
6.	Providing the students with English language ambience in the campus	Insist to speak English compulsory in the campus
7.	Encouraging the students with creative writing	Participate in Story writing skills
8.	Training the students to make write ups in any single tense(Example: simple present or simple past etc)	Taking part in stage activities at regular Intervals
9.	Set small achievable goals for language learning	Participate in more events inter college and intercollegiate.
10.	Grammer practice worksheets	To do grammar practice exercises

Conclusions

Based on the research study and analysis, the researcher found that the main problems faced by the tertiary students in learning English as Second language and possible solutions to overcome those problems. The teachers and students mentioned almost 50% of the problems similar like low confidence, grammatical mistakes, stage fright, previous educational background, poor vocabulary power, fear of talking in English in front of others and no English speaking environment. Even with the possible solution the difficulties of teachers and students is almost 50% similar like create fun based activities, motivate the student by persuading with the reasons of learning English Language, practice worksheets on grammar topics, peer group activities and regularly providing the students an opportunity to present to their peer.

Recommendations

1. To the rural area students – without demoralized oneself with their family, financial and educational background facilitate them with vocabulary enrichment through news paper reading, finding different usage of a particular word by referring to a standard dictionary. Also encourage them to use them in every day conversations. Suggesting them to watch Indian accent English language videos and to observe the attitude, pronunciation, body language and fluency of the speakers.
2. To the language teachers - to improve the English language skills of the students focus on LSRW skills. Plan the English language sessions in such a way that all the four skills are applied in the classroom activity. It is

very essential to make the management and the students to realize that English as a language is very important to achieve their career goals rather than a subject to clear in their graduate course.

3. As a language teacher, during early sessions itself conducting a basic language proficiency test to know the English language standards of their students and plan accordingly the kind of activities that can be implemented for those students.
4. The study researcher also suggests the teachers to encourage the engineering college rural background tertiary students to utilize modern technology by making use of their android mobiles in installing apps like Spreaker, Vimeo , Google translator etc and English speaking learning apps such as Hello English-Learn English, Utter-Learn English etc. as much as possible to improve speaking skills.

References

1. Ganesh, D., Charyulu, G. M., & Hussain, S. S. (2019). L2 Learners' problems in speaking English of rural background engineering students in AP. *International Journal of Recent Technology and Engineering*, 8(3), 5942-5946.
2. SAGAR, B. Problems Faced By Indian Students In Learning English
3. Banditvilai, C., & Cullen, R. (2018). Problems and obstacles in learning English as a Foreign Language. *International Journal of Social Science and Humanity*, 8(12), 289-294.
4. Gupta, D. (2013). Teaching English to engineering students in India. *Journal of Education and Practice*, 4(11), 131-137.
5. Kalia, P. (2017). English language teaching in India: Trends and challenges. *International Journal of Engineering Applied Sciences and Technology*, 2(3), 33-37.
6. <https://www.encyclopedia.com>

CHAPTER 29

DIFFICULTIES FACED BY THE ESL LEARNERS IN RURAL ENGINEERING COLLEGE

S. NANCY MARGRET

SVCET(A), Chittoor

Abstract

In this article I propounded the problems faced by the ESL learners along with the solution. Though English is international language, it is the second language in many countries and regions where the pupils couldn't feel it easy in their learning process which depends on the ability besides few cognitive and physical barriers. This explains about mother tongue influence, frivolous, abysmal dissuade, distraction and proper counsel, influence of vernacular medium, solecism, indecipherable and fast teaching. It's a field study as collected the data by interviewing individually via face to face. This paper offers certain comprehensible and applicable strategies to enhance English as second language.

Introduction

This paper shares the major problem faced by the students related to learn English as second language. It clarifies the problems faced especially by the students from rural areas to learn English. This paper tries to give answers for the questions

1. Why do students hesitate to learn English?
2. Why is that students face difficulty to learn English?
3. What is making them to stop learn English?

and their stumble blocking to learn English. This is an overview by collecting the information from students adopting interview method. The main proposal and objective of this paper is to make the teaching and learning easier to the teacher and to the students who can overcome the problem by making use of the solution as the strategies to accomplish and enhance their teaching, learning and listening skill. This paper reciprocates the ideas and views from both the trainee and the learner, upgrade the methods in addition to the existing teaching methods and drives the teachers to plan the teaching and to grasp the student's interest in language learning.

Problems faced by students in English class (Students Perspective)

Influence of Vernacular Medium

Vernacular medium education plays a significant drawback to the ESL learners, whereas the learners don't have the basic idea or structure of English, in addition have a strong foundation on their vernacular language medium education, besides weak foundation on English which makes them to feel hard neither to learn nor to listen. As a result, learners encounter the stumbling block of solecism and indecipherable. Teacher pulls out by producing and implementing many ideas to enhance the communicative skills.

Solution Identified by the Student

Preferring English language education even in public schools, as public academy offers English as moderate education both in school and college levels. Teachers and the government should instruct besides guiding the pupil regarding the importance of English language and English language education as it plays a vital role in career. Teachers themselves should have a knowledge to deal a class which makes them feel grunted and happy by making the class interesting by giving activities in English like ice breaking activities, vocabulary quiz, grammar quiz which will develop the communicative skill and listening skill.

Solecism

Following Grammar is primary course of action and many learners perceives solecism is a problem relatively pursued by the virtue of vernacular medium pedagogy. As a consequence, they find hard in learning English with the same issue as the trainers teach very fast whereas the learners deteriorate to acknowledge the language and the topic. Grammar is very supreme in English something that makes the language effortless besides helps us in making sense of our words. Grammar is the base which construct the language and make others to understand sensible. Students surmise solecism is one of the awful catastrophes which make to feel predicament by the beginners.

Solution Identified by the Student

Dope out proper grammar from the teacher in the class and concentrate in practicing them regularly so that, the procedure builds strong language. Rigorous practicing and making use of English lab besides communicating in English. Expects well trained and qualified teachers who can upskill grammar easier to ESL learners.

Fast Teaching

Many individual ESL learners came out with self-same issue as the trainer teaches very fast that the learner couldn't neither apprehend nor manage and cope up the classes. Sometimes the impact of vernacular medium the learner finds tuff to understand the class. At times the mentor focuses on the syllabus and rushes the class, certainly makes the learners to feel hard to learn English.

Solution Identified by the Student

Students expects the teacher to teach slower in order to understand the lesson and topic so that the learners augment the concept and try to implement steadily.

Failing to Attend the Classes Regularly

Learners as well as the teachers regrettably experience the impediment hardly by failing to attend the classes regularly as a consequence offrivolous, abysmal dissuade, ennui, lethargy, lack of interest , domestic issues , etc.

Solution Identified by the Student

Student themselves know about their drawback as irregular to the classes sometimes intentionally or unintentionally regarding,frivolous, abysmal dissuade, ennui, lethargy, lack of interest, domestic issues, etc., which fails to learn English language. Must be regular to the classes in forthcoming days to steer clear of such snag.

Indecipherable

A language acquisition always originates with listening and ends with speaking, reading and writing. Here the vernacular medium education pupils fail to perform as they don't have strong foundation towards listening which is the primary and root cause to other skills to accomplish. As students from vernacular medium were never given a chance of neither listening nor speaking in English which is the absolute result of indecipherable and this leads to lack of diffidence, steadiness and stability.

Solution Given By The Students

Giving additional importance to listen the English classes, English news , use the English language lab to a greater extent eventually utilize the audio classes , activities , English projects etc...

Problems Faced by Students in English Class (Teacher's Perspective)

Mother Tongue Influence

Sometimes the mother tongue influence on the orthoepy which change the orthoepy of English. This similar problem predominantly seen in Malayalee's. They change English pronunciation and accent even as Malayalam. Furthermore, thing can be even seen in many other regional language people. Who change the pronunciation and accent to their regional languages. Which consequently leads to the difficulty in learning English. So, mother tongue influences face a lot of problem by befuddled while listening the exact pronunciation.

Solution Identified by The Teacher

Habituating regular classes and listen to the teaching, reading, pronunciation, conversation ,vocabularies , accent , intonation and follow. Clarify the doubts in the class immediately. Make use of English lab and concentrate on the pronunciation and rectify the errors. Learning phonetics which is the utmost one which can solve and overcome mother tongue influence.

Frivolous

These generation juveniles are so aimless and not knowing the thrust of learning the language. They are engrossed on media and wanted to enjoy, enthral the adventure, beguile the time and relish greatly, but not knowing the veracity hidden in learning the language as it is the root cause and gives absolute result which evolve in every stream and profession. This is one of the difficulties to the ESL learners as they are frivolous.

Solution Identified By The Teacher

Anything aimless is nameless said by Albert Einstein, provoking the learners to focus on the goal and achieve. Organising few mentors programme to motivate the students by explaining the significance of future, career, regarding the competitive world, importance of creating job, importance of English, education, etc.

Abysmal Dissuade

Solid abysmal dissuade are one of the problems by the ESL learners, they couldn't concentrate on learning after the abysmal dissuade either by the teacher or by the friends and relatives, which degrades their confidence and couldn't extract the essences and practise it in day to day life. This leads to the draw back to learn ESL and the reason faced by the ESL learners, which makes them to be saturated without any growth and progress in their learning process.

Solution Identified by The Teacher

Either ignore the dissuade or make the dissuade as the challenge, vaguely worry the discouragement and the mock made by the pupils. Never give up and practise learning.

Distraction

ESL learners are sporadically in the course of learning, regarding the noise from the college. Physical torment and poor knowledge about the topic, which makes them not to understand and its not gripping them to dive into the class. Contrasting themselves with the affluent and with brainy, by associating / comparing with lifestyle, colour, dressing sense, language which leads to inferior complex. They get easily distracted with such circumstances are considered as one of the barriers in learning ESL.

Solution Identified by the Teacher

Robust is the finest solution to the loss of appetite which is the consequence of physical torment. Activity based classes during the learning process which can overcome the distraction, so that the learners could acquire something during the class even if distracted. Effective counselling should be given to the one who is facing inferior. Motivating such mentees that novice can achieve.

No Proper Counseling

Most of the pupil are struggling to learn ESL, yet was not capable to accomplish and fulfil their dream since having few barriers as no proper guidance, advice, mentor, no source, poor information, destitute to buy books, besides possessing interest.

Solution Identified by The Teacher

Choosing the mentor who can help them to guide regularly. Following and performing the instruction sincerely. Making use of library books, college language labs, reading newspaper, set a challenge to oneself just to be a role model to the juniors which results to success.

Conclusion

This paper is indeed a data collected from the students, which would definitely help the beginner teachers to deal the classes and the students to solve the problems and overcome the problems. As it is the beginner teachers as well as beginner who learn English who faces such trouble during there teaching and learning process. It explains few problems along with the solution, where both the trainer and trainee suffer to learn and to teach English as second language. It ends with a solution to the stumble blocking to learn English.

CHAPTER 30

ANALYTICAL METHODS TO DETECT ALGAL BLOOMS- MICROCYSTINS IN SPIRULINA DIETARY SUPPLEMENTS

Dr. P. SIVARAAGINI¹

¹Department of Microbiology
PVKN Government College (A), Chittoor, Andhra Pradesh, India

Dr. MOHANO BEHARA²

²Department of Botany
PVKN Government College (A), Chittoor, Andhra Pradesh, India

Abstract

Algae products are attracting growing interest due to their affable taste and their high contents in protein, essential amino acids, vitamins, and minerals. Specifically, Spirulina is a type of blue-green algae that's rich in protein, vitamins, minerals, carotenoids, and antioxidants that can help cover cells from damage. It contains nutrients, including B complex vitamins, beta-carotene, vitamin E, manganese, zinc, copper, iron, selenium, and gamma linoleic acid (an essential adipose acid). Spirulina-like any blue-green algae- can be defiled with poisonous substances called microcystins. It can also absorb heavy essence from the water where it's grown. So far knowledge regarding the impurity with cyanotoxins, heavy essence, fungicides, or polycyclic sweet hydrocarbons (PAHs) is scarce, although some studies reported high pollutants situations in spirulina products. The regular input of spirulina, and veritably likely other algae products as well, as salutary supplements in the gram range demands a closer monitoring of potentially dangerous ingredients. Microcystins are cyclic non-ribosomal peptides produced by some cyanobacteria similar as Micerocystis aeruginosa, the main patron of these cyanotoxins. They're considered important hepato-poisons, and are treated as veritably dangerous, indeed though on the ground of rather questionable scientific data. Yet, every so frequently appears an composition that raises concern about the possible toxin of microalgae, and particularly of the cyanobacterium Aphanizomenonflosaquae. Analytical styles used to descry hosts ranging from natural, biochemical and chemical as well as the recently arising biosensor mehods.

Keywords: Microcystin Analytical styles, Spirulina Dietary supplements.

Cyanobacterial dangerous algal blooms (CyanoHABs) produce microcystins (hosts) which are associated with beast and mortal hepatotoxicity. Over 270 variants of MC live. Hosts have been continually studied due of their poisonous consequences. Monitoring water quality to assess the presence of hosts is of utmost significance although it's frequently delicate because Cyano HABs may induce multiple MC variants, and their low attention in water. The three main logical styles used to descry hosts ranging from natural (mouse bioassay), biochemical (protein phosphatase inhibition assay and enzyme linked immunosorbent assay), and chemical (high performance liquid chromatography, liquid chromatography-mass spectrometry, high performance capillary electrophoresis, and gas chromatography), as well as the recently arising biosensor methods.

Cyanotoxins Methods and Approaches for their Analysis and Discovery

Biological Methods

MBA (Mouse Bio Assay)

This system is substantially used to descry hosts in creatures with unknown poisons composition. Generally, poisons excerpts are administered via intraperitoneal injection into mice. The murderous cure LD₅₀ by intraperitoneal route ranges from 50(MC-LR) to 600(MC-RR) µg/kg while oral LD₅₀ is 5000 µg/kg. MBA may also employ microbes, brute and invertebrate creatures, cell cultures or plants and plant extracts to detect MCs

Biochemical Method

Enzyme Linked Immunosorbent (ELISA)

Enzyme linked immunosorbent assay, which is able to detect several MC variants, is a good screening technique particularly useful to demonstrate the presence of hosts producing cyanobacteria, track relative changes in hosts

attention and give indication to control blooms in water source. Owing to the antibodies developed against β - amino acid Adda set up in utmost MC variants, developments of ELISA exercising polyclonal and monoclonal antibodies have been made possible. The first polyclonal antibody raised against MC was reported by Brooks and Cod, still, its first successful use against MC in rabbit was demonstrated by Chu et al. also, the first use of anti-MC monoclonal was reported by Kfir et al. To date, several ELISA ways live for host's discovery in the terrain. New ELISA exercising antibodies uprooted from eggs of immunized cravens, competitive circular ELISA (CI- ELISA) exercising antibodies raised in lamb against 6(E) Adda, as well as competitive direct ELISA (CD- ELISA) and CI- ELISA generated from rabbits conjugated with gamma- globulin were applied to detected colorful MC variants in water samples. lately, the recently developed CI- ELISA, which employed MC- LR- keyhole limpet hemocyanin (KLH) for New Zealand white rabbit immunization and produced antibodies, detected MC- LR with a limit of discovery (LOD) of 0.0016 ng/ ml.

Chemical Method

High performance Liquid Chromatography (HPLC)

The most generally and extensively used laboratory fashion to dissect hosts by means of different stationary and waterless mobile phases containing methanol or acetonitrile is HPLC and its linked ways. Ultraviolet-visible spectroscopy (UV-Vis) absorbance and print- diode array (PDA) discovery ways are substantially associated with HPLC system. Generally, hosts have UV immersion between 190 nm and 300 nm, with an outside at 238 nm. The most generally used discovery is UV immersion at 238 nm, which is generally performed with PDA sensors. Still, MC variants that contain tryptophan indicate a maximum immersion at lower wavelengths of 222 nm. To gain acceptable resolution for hosts discovery, HPLC relies on the use of high- resolution RP C18 columns, 15 or 25 cm in length and 3 to 5 mm in range. It's worth noting that the confine range of host's discovery is associated with attention factors attained and the volume of sample. Parameters similar as mobile phase composition and HPLC conditions including inflow rate, temperature and column features (including stationary phase, silanol exertion and length) may regard for an excellent separation and perceptivity of HPLC. For successful use of this fashion, a worldwide certified reference material to purify and quantify hosts has been conceded. This will help to insure standardization of routine laboratory analysis of these poisons. To ameliorate upon the perceptivity and selectivity of HPLC, novels including glamorous solid- phase birth (MSPE) coupled with HPLC/UV grounded on a glamorous bentonite sorbent fabricated by solvothermal conflation system, MSPE grounded on mesoporous Fe₃O₄@mSiO₂@Cu₂ nanoparticles (NPs) coupled with HPLC, and MSPE coupled with HPLC/ UV where the magnetic composite material was combined with cetylpyridinium chloride prepared by hydrothermal conflation were developed and validated for trace discovery and analysis of hosts.

Biosensor method to detect Microcystins

To date, the styles described in have been employed to cover and descry different MC variants in the terrain. While these ways are precise and sensitive, precious instrumentation, well- trained labor force and time- consuming procedures are involved. This suggests that their operations may primarily be limited to well- resourced and consolidated laboratory installations. Accordingly, development of low- cost and ultrasensitive measuring system would help limit exposure by enabling early discovery and nonstop monitoring of hosts. In recent times, the robust, simple, specific, sensitive, movable, easy to use and rapid-fire biosensor system which functions as an enhanced monitoring tool for hosts, particularly to dissect low hosts attention and manage the threat associated with health, is gradationally gaining global focus. Biosensor is a logical tool made up of a natural recognition element nominated as bioreceptor, in direct contact with a transducer. This logical tool can be classified either by their natural recognition element or signal transduction styles. A bioreceptor in biosensor is frequently combined with a suitable transduction system to induce a signal following commerce with the target patch of interest. Its worthwhile noting that colorful natural and artificial natural rudiments including whole cells, enzymes, antibodies, molecularly ingrained polymers (MIPs) and nucleic acids are employed in biosensors.

Conclusion

Presences of hosts hanging humans, creatures and shops, and the numerous problems associated with these poisons have called for water attention mindfulness in numerous countries across the globe. Constant monitoring for hosts in drinking water, recreational water and other implicit avenues has come vital in order to effectively manage and control hosts and help or minimize the health pitfalls associated with the poisons 'pollution. For better monitoring, sensitive, fast and dependable webbing styles able of detecting hosts in the terrain are urgently needed at an early stage. Mouse bioassay is useful for original webbing of hosts in samples of unknown toxin, and it makes effective use of the whole beast. Still, it lacks a realistic way to dissect hosts, gives poor quantitative data, and for ethical reasons is veritably infrequently used for testing if at all. The ELISA fashion is useful for routine webbing of water and able of detecting the total quantum of hosts due to its high perceptivity and particularity. Nevertheless, it's unfit to distinguish MC variants and relative toxin and may explosively be affected by matrix goods.

The most dependable fashion is HPLC- grounded styles where norms for the poisons present are available and LC- MS for evidence, identification and quantification of MC variants substantially in the laboratory. HPLC and HPLC- MS are effective and important ways to descry hosts in complex matrixes, although styles grounded on HPLC alone fail to give structural information on hosts. Also, further expansive exploration aimed at perfecting these styles for better use is needed, especially for field operations to descry hosts in the future. It's of interest that important attention should also be given to the arising biosensors because of their remarkable perceptivity, selectivity, simplicity and portability. The development of biosensors offers rapid-fire and accurate discovery, as well as high reproducibility of MC- LR. Either, the satisfactory reclamations of these styles signify that they retain good delicacy, respond snappily and avoid hindrance; thus, their operation for host's discovery should be encouraged. Still, farther examinations are needed to determine the other MC variants in water and natural samples using the biosensor system.

References

1. Howard M.D.A., Nagoda C., Kudela R.M., Hayashi K., Tatters A., Caron D.A., Busse L., Brown J., Sutula M., Stein E.D. Microcystin prevalence throughout Lentic waterbodies in Coastal Southern California. *Toxins*. 2017; 9:231. doi: 10.3390/toxins9070231. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
2. Kfir R., Johannsen E., Botes D.P. Preparation of Anti-cyanoginosin-LA Monoclonal Antibody. In: Steyn P.S., Vlegaar R., editors. *Mycotoxins and Phycotoxins, Bioactive Molecules*. Volume 1. Elsevier; Amsterdam, The Netherlands: 1986. pp. 377–385. [Google Scholar]
3. Khomutovska N., Sandzewicz M., Lach L., Suska-Malawska M., Chmielewska M., Mazur-Marzec H., Ceglowska M., Niyatbekov T., Wood S.A., Puddick J., et al. Limited Microcystin, Anatoxin and Cylindrospermopsin Production by Cyanobacteria from Microbial Mats in Cold Deserts. *Toxins*. 2020;12:244. doi: 10.3390/toxins12040244. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
4. Mantzouki E., Lürling M., Fastner J., de SenerpontDomis L., Wilk-Woźniak E., Koreivienė J., Seelen L., Teurlinx S., Verstijnen Y., Krztoń W., et al. Temperature Effects Explain Continental Scale Distribution of Cyanobacterial Toxins. *Toxins*. 2018;10:156. doi: 10.3390/toxins10040156. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
5. Zhang C., Massey I.Y., Liu Y., Huang F., Gao R., Ding M., Xiang L., He C., Wei J., Li Y., et al. Identification and characterization of a novel indigenous algicidal bacterium *Chryseobacterium* species against *Microcystis aeruginosa*. *J. Toxicol. Environ. Health Part A*. 2019;82:845–853. doi: 10.1080/15287394.2019.1660466. [PubMed] [CrossRef] [Google Scholar]

CHAPTER 31

A METHODOLOGY FOR SIMULATING TORQUE RIPPLE REDUCTIONS IN BLDC MOTORS

SHAHURAJ S. SABLE & Dr. ASHOK KUMAR JHALA

Bhabha University, BHOPAL, MP

Abstract

In this research, a neural controller for decreasing torque ripples from PMBLDCM drives with trapezoidal back-emf is designed and put into use. The offered speed regulation technique for brushless dc motors, which are thought to be a highly nonlinear lively complex system, is demonstrated using simulation results to highlight its strengths and weaknesses. Software called Matlab/Simulink was employed to simulate the suggested model. In this study, a buck-boost converter that is utilized to reduce the commutation ripples from torque in PM brushless Drive system that is coupled here between input Dc supply & inverter is described. By regulating the phase current that is not undergoing commutation, which determines torque during the commutation period, torque ripple can be reduced. Moreover, compared to the typical conduction period, a higher Dc source voltage is required at the time of commutation period of time. During the transition time, the Buck-boost converter runs in boost mode to increase the DC voltage going to the inverter. To modify the output phases of a Buck-boost converter during normal as well as commutation time intervals, a straightforward mode switching circuitry is used. This topology's simulation experiments are done in the MATLAB/Simulink environment.

Keywords: PMBLDCM, Buck-boost, Commutation, Time period, PIController.

Introduction

One type of small-scale motor utilized in small electric gadgets like CD players, hard drives, and even tiny electric cars is the brushless DC motor. Permanent magnets are installed on the rotor of it. It is not necessary to excite the field further. For applications requiring position and variable speed drive, this drive is well known and widely used.

The main benefits of this drive over others with similar ratings are its better ratio of generated torque to weight, quick response time, precise position control, decreased moment of inertia, low maintenance requirements, etc. Modern brushless motors are built very similarly to ac motors, often known as permanent magnet synchronous motors. Simulation results are used to show the abilities and shortcomings of the proposed method as compared with the The strengths and weaknesses of the suggested approach in comparison to the conventional PI / ANN controllers are demonstrated using simulation data. Because of its great power density and simplicity of control, permanent magnet brushless Electric motors (PMBLDC) are used extensively in a variety of industrial settings. The most common method for controlling these motors is 3 phase power semiconductor bridge. Rotor position sensors are necessary for the inverter bridge's starting process as well as for delivering the correct commutation sequence to switch on the power devices.

The power devices were commutated progressively every 60 degrees depending on the rotor position. The motor needs the right speed controllers to work at the optimum level. Permanent magnet motors often use a proportional-integral (PI) controller to achieve speed control. Because of their straightforward control architecture and ease of use, traditional PI controllers are frequently employed in the industry. However, these controllers have limitations when dealing with complicated control issues including nonlinearity, load disturbances, and parametric fluctuations. Also, accurate linear mathematical models are needed for PI controllers.

The creation and execution of a neural network driver for a brushless DC (BLDC) drive with a trapezoidal back-emf are shown in this project.

The suggested neural network controller's performance is contrasted with that of the related fuzzy PI controller and traditional PI controller. The recommended speed regulation technique for brushless dc motors, which are thought to be a non- linear dynamic complex system, is demonstrated using simulation results to highlight its strengths and weaknesses. Software called MATLAB/Simulink was employed to simulate the suggested model.

Methodology

1. The Artificial Neural Network Controller Model the controller is represented as a nonlinear map between the inputs and outputs. Depending on a specific plant, the map (in the form of a network) can be trained to implement any kind of control strategy. A neuro-controller (neural networks-based control system) performs a specific form of the adaptive control with the controller taking the form of a multi-layer network and the adaptable parameters being defined as the adjustable weights. The main advantages are:

- Parallel architecture
- Any kind of nonlinear mapping is possible
- Training is possible for various operating conditions, so, it can be adapted to any desired situation.

Artificial neural networks (ANNs), usually simply called neural networks (NNs) or neural nets, are computing systems inspired by the biological neural networks that constitute animal brains.

2. A Buck-boost converter is inserted between DC source and inverter to control the DC link voltage. Mode switching circuit effectively handles the operating approach of the converter in the commutation interval to boost the input of the inverter.

The buck-boost converter is a type of DC-to-DC converter that has an output voltage magnitude that is either greater than or less than the input voltage magnitude. It is equivalent to a flyback converter using a single inductor instead of a transformer.

3. Proportional Integral controller sometimes also known as proportional plus integral (PI) controllers. It is a type of controller formed by combining proportional and integral control action. Thus, it is named as PI controller.

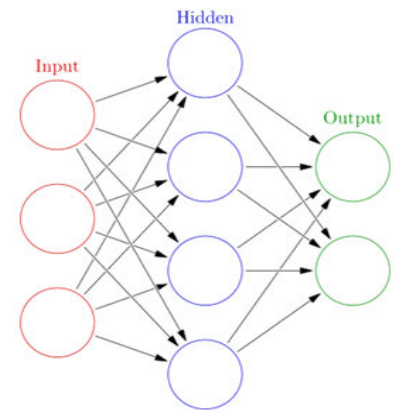


Fig.1 ANN Topology for drive

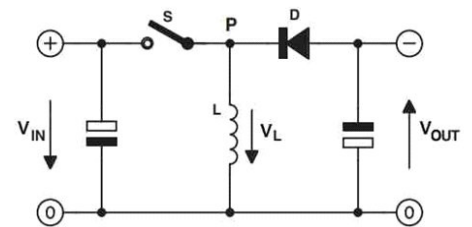


Fig. 2 Buck-Boost structure

Result

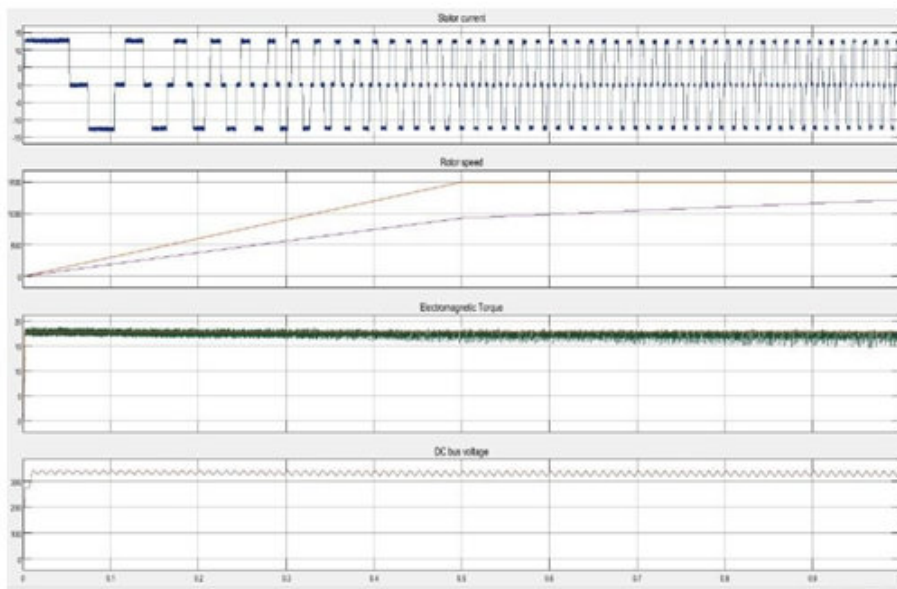


Figure 3 Current, Speed, Electromagnetic torque, DC bus voltage

Conclusion

This article demonstrates control techniques for reducing torque ripples in BLDC motors. The non-ideal current waveforms occur from the pulse torque excursions deviating from ideal conditions, which is either due to the design of the motor or the converter circuit supply.

References

1. K. Byung-taek, " Minimization of torque ripple in a BLDC motor using an improved DC link voltage control method," in Telecommunications Energy Conference, 2009. INTELEC 2009. 31st International, 2009, 1-5.
2. B. Dunxin, " A PWM control algorithm for eliminating torque ripple caused by stator magnetic field jump of brushless DC motors", in Intelligent Control and Automation,2008. WCICA 2008. The 7th World Congress on, 2008, 6547-6549.
3. Z. Zhong-chao, " A novel PWM scheme to eliminate the diode freewheeling in the inactive phase in BLDC motor", Frontiers of Electrical and Electronic Engineering in China, vol. 1, 194-198, 2006.
4. D.Mahesh, V.Marthandan ," A model predictive control to reduce torque ripple for brushless dc motor with inbuilt stator current control,” Universal Journal of Electrical and Electronic Engineering 1(3): 59-67, 2013.
5. B. Chen, " Influences of PWM mode on the current generated by BEMF of switch-off phase in control system of BLDC motor", in Electrical Machines and Systems, ICEMS 2001. Proceedings of the Fifth International Conference on, 2001, 579-582 vol.1.
6. HaoXiong, Huaishu Li, "Commutation torque ripple reduction in BLDC motor using PWM_ON_PWM mode," in Electrical Machines and Systems, 2009. ICEMS 2009. International Conference on, 2009, 1- 6.

CHAPTER 32

GROWTH PROSPECTS OF EDTECH INDUSTRIES IN INDIA

PRADEEPTA KUMAR PATNAIK¹

¹Department of Botany, Gopalpur College
Gopalpur on-sea, Ganjam, Odisha

Dr. MOHANO BEHARA²

²Department of Botany
P.V.K.N. Government College (Autonomous), Chittoor, A.P

Introduction

Ever since the global pandemic of COVID-19 struck India in early 2020, everything has changed from normal to a new normal. The most perceptible change that has undergone is the education sector. When life was completely paralyzed and people were forced to stay confined to their four walls, it was absolutely impossible to conduct physical classes in educational institutions. So, to counter the underlying difficulties in these trying times, they started adopting to technologies for replacing the traditional methods of teaching with relatively innovative ones. Online teaching and learning became a new normal, and with this change, the use of modern educational tools also increased enormously. As a result of these transformational changes, many new EdTech start-ups came up and the existing ones have put their steps on the escalators to leverage this opportunity. Besides fulfilling the needs of the students and teachers, they also aim to take advantage of other professionals who are working online. Therefore, there has been a quantum jump in the scale and volume of this industry. Even though the pandemic is now at the neigh end, these industries are gaining traction. According to the India Brand Equity Foundation (IBEF) report, the Indian EdTech industry which was valued at US\$ 750 million in 2020 is expected to reach US\$ 4 billion by 2025.

Key words: EdTech, Internet, Online, Internet of Things (IoT)

Factors contributing to their growth

There are multiple factors contributing to the growth of EdTech industries in India, but a major driving force has been the widespread availability of affordable internet and mobile devices in the country. It is expected that this availability will continue in the future, driving the continued growth of the EdTech industry. The following points evince the growth potential of the EdTech industries in India;

High Internet Penetration

According to the IAMAI-Kantar ICUBE 2020 report, the country's estimated number of active internet users which was 622 million in 2020 is expected to increase to 900 million by 2025. One of the key stimulators for the expansion of the Internet in India is the rising use of smartphones, and their use for communication, entertainment, and social media. As per the report, nine out of ten active users access the internet every day with the average time spent on the internet is around 2 hours per day. Most users access the internet for entertainment and recreational purposes, for communication while some use it to access social media platforms. Other major activities on the internet include video streaming, gaming, and learning.

The continuous growth in the number of internet users in India is contributing significantly to the expansion of the EdTech industry since the population gets the chance to access mobile phones with better connectivity.

High Penetration of Smart Devices

The penetration of smart and connected devices is picking up in India. According to the latest report of the Internet of Things (IoT) - Spring 2022 report, the number of global IoT connections grew by 8% in 2021 to 12.2 billion active endpoints, representing significantly lower growth than in the year 2020. It is expected that by 2025, as supply constraints ease and growth further accelerates, there will be approximately 27 billion connected IoT devices.

With mobile being the most preferred gateway for online content consumption in India, deeper penetration of high-speed internet and smartphones is creating a sustainable network of digital users who are exploring the internet for applications beyond social media and e-commerce and creating another open opportunity for EdTech start-ups.

Increasing Online Content Consumption

Online content creation has been quite appealing and attractive to Indian audiences in terms of educational and other content. The majority of EdTech start-ups in India today have a line of products in video format, besides visual and textual offerings. The traction of online educational content in the country is poised to grow exponentially.

Young Employable Population

The majority of EdTech start-ups in India today have a line of working population in the age group of 15 to 64 years comprising the existing employed or employable groups as well as the people potentially joining the workforce in the near future. As of 2021, the working population was more than 68% of the total population in the country. The two important parameters for ensuring employability in today's market, skillset, and certification, underpin the foreseeable demand for companies providing skill development and online certification, products in video format, besides visual, and textual offerings.

Increased Demand for Skilled Professionals

New-age technologies such as machine learning, artificial intelligence, blockchain, augmented/virtual reality, and natural language processing have already contributed to millions of jobs in India. But these domains need people with specific skill sets often missing in Indian graduates. That in turn means it is essential for graduates and professionals to upskill by unlocking the potential of online learning platforms. With around 280 Mn individuals expected to enter the jobs market by 2050, the demand for reskilling and acquiring new skills is poised to become the need of the hour for working professionals.

Government Support

The government's increasing focus on the EdTech industry has created a more supportive environment for EdTech companies to operate in. This will help drive the growth and development of the industry.

It is heavily promoting digital education, investing in EdTech start-ups, and issuing policies to encourage the use of online learning platforms and digital educational resources. Among them, the most significant is the National Education Policy (NEP) 2020.

The National Education Policy (NEP) 2020's emphasis on technology in education is expected to drive up demand for EdTech products and services. It provides opportunities for new companies to enter the market and for existing companies to expand to develop innovative solutions that address the evolving needs of the education sector. Moreover, the government presents huge possibilities for foreign investors with its policies permitting 100% foreign direct investment (FDI) in the education sector under the automatic route of approval. By making the process easier and more streamlined, this policy creates opportunities for international collaboration and the exchange of ideas, which can further enhance the growth and effectiveness of education technology in the country.

Summary

To sum up, the future of EdTechs in India looks bright and promising with the increasing adoption of technology in rural and small towns of the country. The government is also encouraging the development of EdTech in India by documenting policies that urge support for the use of technology in education. The unification of hybrid learning models and web communities into EdTech experiences will remain a crucial aspect of education in the future. These advances tender a chance for students to acquire significant expertise and skills that can help their personal and professional development.

Overall, as the education sector continues to advance, it is inevitable that we will see the development of advanced technologies, platforms, and learning methodologies aimed at optimizing the efficiency and effectiveness of education.

CHAPTER 33

MULTIVARIATE LINEAR REGRESSION CONCEPTUAL MODEL AND APPLICATIONS

Dr. V. MUNAIAH¹ & Dr. S. CHANDRABABU³

^{1,3}Lecturer in Statistics, PVKN Govt. College (A), Chittoor, Andhra Pradesh

Dr. T. GANGARAM²

²Lecturer in Statistics, SVA Govt. College (M), Srikalahasti, Andhra Pradesh

Abstract

Data driven decision making is the state of the art today. Engineers today gather huge data and seek meaningful knowledge out of these for interpreting the process behavior. Scientists do experiments under controlled environments and analyze them to confirm or reject hypotheses. Managers and administrators use the results out of data analysis for day to day decision making. As the data collected and stored are multidimensional, to extract knowledge out of it requires statistical analysis in the multivariate domain. This article explains the Multivariate statistical Model, General linear model with applications of R software. The General Linear Model (GLM) is a widely used statistical framework that allows researchers to model the relationship between a dependent variable and one or more independent variables. The model is used extensively in various fields of research, including psychology, economics, and biology, among others. In this article, we will explore what the GLM is, how it works, and its uses in prediction.

Definition of General Linear Model

The GLM is a statistical framework that allows researchers to model the relationship between a dependent variable (Y) and one or more independent variables (X₁, X₂, ..., X_n). It is a flexible model that can accommodate a variety of data types, including continuous, categorical, and binary data.

The GLM assumes that the dependent variable is linearly related to the independent variables, which means that any change in the independent variables is associated with a proportional change in the dependent variable. The model can also handle non-linear relationships by transforming the dependent or independent variables.

Working procedure of General Linear Model

The GLM is based on the idea of maximum likelihood estimation, which involves finding the parameter values that maximize the likelihood of the observed data. In other words, the model estimates the parameters that best fit the data. The GLM includes three main components: the linear predictor, the link function, and the error distribution. The linear predictor is a function of the independent variables, which is used to estimate the expected value of the dependent variable. The link function is used to transform the expected value of the dependent variable so that it can be modeled as a linear function of the independent variables. Finally, the error distribution is used to model the variability in the dependent variable that is not accounted for by the independent variables.

Uses of General Linear Model in prediction

The GLM has many applications in prediction, including:

1. **Linear Regression:** The GLM is commonly used for linear regression, which involves predicting a continuous dependent variable from one or more continuous independent variables.
2. **Logistic Regression:** The GLM can also be used for logistic regression, which involves predicting a binary dependent variable from one or more independent variables.
3. **Poisson Regression:** The GLM can also be used for Poisson regression, which involves predicting a count dependent variable from one or more independent variables.
4. **ANOVA and ANCOVA:** The GLM can also be used for analysis of variance (ANOVA) and analysis of covariance (ANCOVA), which involve comparing means or regression lines across different groups or levels of a categorical variable.

Thus the General Linear Model is a powerful and flexible statistical framework that can be used to model the relationship between a dependent variable and one or more independent variables. It is widely used in various fields of research and has many applications in prediction. The model allows researchers to test hypotheses, make predictions, and draw conclusions about the relationships between variables.

Multivariate Linear Regression Model

Multivariate linear regression is a statistical technique used to model the relationship between multiple independent variables and a single dependent variable. It assumes a linear relationship between the independent variables and the dependent variable, and the goal is to find the best linear combination of the independent variables that predicts the value of the dependent variable.

The conceptual model for multivariate linear regression can be illustrated as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_p X_p + \varepsilon$$

Where:

Y is the dependent variable that we are trying to predict.

$X_1, X_2, X_3, \dots, X_p$ are the independent variables.

$\beta_0, \beta_1, \beta_2, \beta_3, \dots, \beta_p$ are the coefficients of the independent variables, which represent the change in Y for a one-unit change in each independent variable, while holding all other independent variables constant.

ε is the error term or the random error that is not explained by the model.

The goal of multivariate linear regression is to estimate the values of the coefficients $\beta_0, \beta_1, \beta_2, \beta_3, \dots, \beta_p$ that provide the best fit to the data. This is done by minimizing the sum of the squared errors between the predicted values of Y and the actual values of Y.

The model assumptions for multivariate linear regression include

Linearity: The relationship between the independent variables and the dependent variable is linear.

Independence: The observations are independent of each other.

Homoscedasticity: The variance of the errors is constant for all values of the independent variables.

Normality: The errors follow a normal distribution.

No multicollinearity: The independent variables are not highly correlated with each other.

The conceptual model for multivariate linear regression is a mathematical equation that represents the relationship between the dependent variable and multiple independent variables. The goal is to estimate the values of the coefficients that provide the best fit to the data, and the model assumptions include linearity, independence, homoscedasticity, normality, and no multicollinearity. Multivariate linear regression is a powerful tool for predicting the value of a dependent variable based on the values of multiple independent variables, and it has many applications in various fields such as finance, marketing, and healthcare.

Let us discuss related software that deals with Multivariate Regression analysis

R is an open-source statistical software that is widely used for regression analysis. Regression analysis is a statistical technique used to model the relationship between a dependent variable and one or more independent variables. In this article, we will explore the various applications of R software in regression analysis.

1. **Linear Regression:** R software is widely used to perform linear regression analysis. Linear regression is a statistical technique that models the relationship between a dependent variable and one or more independent variables using a linear equation. R provides various functions such as `lm()`, `glm()`, and `lm.beta()` to perform linear regression analysis.
2. **Logistic Regression:** R software is also used to perform logistic regression analysis. Logistic regression is a statistical technique used to model the relationship between a binary dependent variable and one or more independent variables. R provides various functions such as `glm()`, `logistf()`, and `polr()` to perform logistic regression analysis.

3. **Time-Series Analysis:** R software is widely used for time-series analysis, which is a statistical technique used to analyze time-dependent data. R provides various functions such as `ts()`, `arima()`, and `forecast()` to perform time-series analysis.
4. **Multivariate Regression:** R software is used to perform multivariate regression analysis, which is a statistical technique used to model the relationship between a dependent variable and multiple independent variables. R provides various functions such as `lm()`, `glm()`, and `nls()` to perform multivariate regression analysis.
5. **Nonlinear Regression:** R software is used to perform nonlinear regression analysis, which is a statistical technique used to model the relationship between a dependent variable and one or more independent variables using a nonlinear equation. R provides various functions such as `nls()` and `SSasymp()` to perform nonlinear regression analysis.
6. **Generalized Linear Models (GLMs):** R software is used to perform generalized linear model (GLM) analysis, which is a statistical technique used to model the relationship between a dependent variable and one or more independent variables using a non-normal distribution. R provides various functions such as `glm()`, `gam()`, and `polr()` to perform GLM analysis.

R software is a powerful tool for regression analysis, and it is widely used in various fields such as finance, marketing, healthcare, and agriculture. R provides a vast array of functions and packages to perform various types of regression analysis, making it an essential tool for data analysts and researchers.

References

1. "Multiple Linear Regression Analysis Using R" by David Lilja (<https://www.r-bloggers.com/2016/01/multiple-linear-regression-analysis-using-r/>)
2. "Multivariate Regression Models: The Basics" by Karen Grace-Martin (<https://www.theanalysisfactor.com/multivariate-regression-models-the-basics/>)
3. "Applied Multivariate Regression Analysis in R" by Max Kuhn and Kjell Johnson (<https://cran.r-project.org/web/packages/caret/vignettes/caretMixup.html>)
4. "Multivariate Regression Models with R" by William Revelle (<https://www.personality-project.org/r/html/multivariate.html>)
5. "Multiple Linear Regression with R" by Jason Bryer (https://cran.r-project.org/doc/contrib/bryer/multiple_regression.pdf)
6. "Multivariate Analysis and Regression with R" by William Revelle (https://personality-project.org/r/html/Regression_Analysis.html)
7. "Multiple Regression Analysis in R" by Paul Johnson (<https://www.datacamp.com/community/tutorials/multiple-regression-in-r>)
8. "Multivariate Regression with R: An Application to Housing Prices" by Yanchang Zhao (<https://www.r-bloggers.com/2012/08/multivariate-regression-with-r-an-application-to-housing-prices/>)
9. "Multivariate Linear Regression in R" by Jeff Hamrick (<https://www.datascienceblog.net/post/machine-learning/multivariate-linear-regression-in-r/>)
10. "Introduction to Multivariate Regression Analysis in R" by Jason Bryer (<https://jason.bryer.org/ISI-MultivariateRegression/>)

CHAPTER 34

COVID - 19, AND ITS IMPACT ON THE SOCIETY

Dr. JYOTSNARANI PANDA (Ph.D)

M.A, MPhil and PH.D in Home Science, IGNOU
BJB Autonomous College, Bhubaneswar, Odisha

Dr. MOHANO BEHERA

Department of Botany, PVKN.Government College (Autonomous)
Chittoor, Andhra Pradesh

Abstract

This study aims: to analyse the COVID-19 virus and its impact on the society. The general lifestyle of people during the pandemic is crucial to this study. The main objective: is to investigate the extent of this virus and its influence on the socio- economic status of the society. The empirical research method is employed in this study. This research will not only give a compact perspective of the virus and its severity but will also provide new dimension on the impact and prevention of the virus.

This research has several geographic limitations as only the Indian context of the virus has been analysed. The result of the study cannot be taken as compact for the research of virus .Future Scholars must examine and include new perspective on the virus.

Introduction

COVID-19 is the disease caused by a new corona virus called SARS-CoV-2. WHO first learned of this new virus on 31 December 2019, following a report of a cluster of cases of ‘viral pneumonia’ in Wuhan, People’s Republic of China. Corona viruses are a group of enveloped viruses with non-segmented, single-stranded, and positive-sense RNA genomes. Apart from infecting a variety of economically important vertebrates (such as pigs and chickens), six corona viruses have been known to infect human hosts and cause respiratory diseases. Among them, severe acute respiratory syndrome corona virus (SARS-CoV) and Middle East respiratory syndrome corona virus (MERS-CoV) are zoonotic and highly pathogenic corona viruses that have resulted in regional and global outbreaks Corona viruses possess a distinctive morphology, the name being derived from the outer fringe, or “corona” of embedded envelope protein. Members of the family Corona virus cause a broad spectrum of animal and human diseases. Uniquely, replication of the RNA genome proceeds through the generation of a nested set of viral mRNA molecules. Human corona virus (HCoV) infection causes respiratory diseases with mild to severe outcomes.

A novel corona virus, designated as 2019-nCoV, emerged in Wuhan, China, at the end of 2019. As of January 24, 2020, at least 830 cases had been diagnosed in nine countries: China, Thailand, Japan, South Korea, Singapore, Vietnam, Taiwan, Nepal, and the United States. Twenty-six fatalities occurred, mainly in patients who had serious underlying illness. Although many details of the emergence of this virus — such as its origin and its ability to spread among humans — remain unknown, an increasing number of cases appear to have resulted from human-to-human transmission. Corona viruses make up a large family of viruses that can infect birds and mammals, including humans, according to world health organisation (WHO). These viruses have been responsible for several outbreaks around the world, including the severe acute respiratory syndrome (SARS) pandemic of 2002-2003 and the Middle East. Respiratory syndrome (MERS) out break in South Korea in 2015. Most recently, a novel corona virus (SARS-CoV-2, also known as COVID-19) triggered an outbreak in China in December 2019, sparking international concern. While some corona viruses have caused devastating epidemics, others cause mild to moderate respiratory infections, like the common cold.

Indian Scenario

As of 1 February 2022, India reported a total of 4,14,69,499 confirmed cases. In the past 24 hours, 1, 67,059 confirmed cases have been reported. During third wave, highest cases in a day were 3, 47,254 cases reported on 21st January 2022.

Testing Programme

COVID-19 testing across India uses a mix of two types of tests.

- a) Testing Method: Real-time reverse transcription polymerase chain reaction (RT-PCR), Rapid Antigen Tests (RATs) is used for COVID test.
- b) Specimen collection: Nasal swab and Throat Swab
- c) Vaccination Programme

India began administration of COVID-19 vaccines on 19 January 2021. India has two approved COVID-19 vaccines: Covishield and Covaxin. Both of them were exported and used in foreign grants by the Government of India. Citizens above the age of 15 can book appointments through the COWIN platform or can do a Walk-In registration on site. All vaccine centres have registration desks, vaccine booths and observation rooms. Vaccine certificates can be downloaded digitally through the COWIN platform, or citizens can ask for a hard copy from vaccination centres. All government run vaccination centres provide free of cost vaccines, private centres do charge.

Odisha Scenario

The first case of the COVID-19 pandemic was confirmed in the Indian state of Odisha on 16 March 2020. It took 114 days for Odisha to register its first 10,000 cases (on July 7). The next 10,000 cases came in just 15 days, indicating the rapid spread of the infection. In July alone, the state has recorded 105 new deaths, up from 25, even as the state government announced complete lockdown in four hotspot districts including Ganjam and Khurda.

COVID-19 pandemic in Odisha

In recent report, Odisha's COVID-19 caseload mounted to 11,22,735 with 10,856 fresh infections, while two more fatalities pushed the death toll to 8,478, the Health Department said in a bulletin. Most of the infected persons are asymptomatic

Importance of Covid-19

The virus that causes COVID-19, SARS-CoV-2, is a zoonotic virus, which means it can spread between people and animals. As more animals are reported infected with the COVID-19 virus, it becomes increasingly clear that a One Health approach is crucial to address new disease threats that affect both people and animals

Covid-19 has Severe Impact on the Society

India team hit by Covid outbreak: Crew of Indian cricket team has been affected by the rigorous spread of Covid-19 which put a question mark on the series of matches. With the 3-days quarantine of other players and arrival of the West Indies team in Ahmedabad for the series, BCCI made a statement on the flexibility of the series schedule and chances of pushing it by a couple of days if and if needed India logs over 1.6L Covid cases & 1,733 deaths Omicron sub-variant in 57 countries:

The WHO released a statement on rapid spread of a contagious sub-variant of Omicron coronavirus in 57 countries. The weekly epidemiological update stated that among the sub-lineages BA.1, BA.1.1, BA.2, and BA.3 still account for over 96% of Omicron sequences. Whereas in few countries BA.2 has accounted for half Omicron sequences which is more infectious than the original Omicron. Kandhamal turmeric growers seek hike in procurement price:

The Kandhamal turmeric that received the Geographical Indication (GI) tag in 2019 is now in despair for a price hike. The pandemic hit the growers worse who had a ray of hope for profit making after GI tag now started demanding The Kandhamal Apex Spices Association for Marketing (KASAM) for a price hike which is now procuring the turmeric at Rs.60 per kg. The farmers have been told that their demands will be considered only if export resumes.

People were also engaged in some economic activities such as casual labour activities, self-employment in street vending, small petty business, rickshaw pulling, rag picking and salaried jobs everyone accepted that there has been a drop in their income since the covid pandemic. Pandemic has created 60% of poverty in India (2023).

Review of Literature

Covid-19

Coronavirus disease 2019 (COVID-19) is a contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first known case was identified in Wuhan, China, in December 2019. The disease has since spread worldwide, leading to an ongoing pandemic. Symptoms of COVID-19 are variable, but often include fever, cough, headache, fatigue, breathing difficulties, loss of smell, and loss of taste. Symptoms may begin one to fourteen days after exposure to the virus. At least a third of people who are infected do not develop noticeable symptoms. Of those people who develop symptoms noticeable enough to be classed as patients, most (81%) develop mild to moderate symptoms (up to mild pneumonia), while 14% develop severe symptoms (dyspnoea, hypoxia, or more than 50% lung involvement on imaging), and 5% suffer critical symptoms (respiratory failure, shock or multi organ dysfunction). Older people are at a higher risk of developing severe symptoms. Some people continue to experience a range of effects (long COVID) for months after recovery, and damage to organs has been observed.

Variants of Concern

The virus that causes COVID-19 is constantly changing, and new variants of the virus are expected to occur. Sometimes new variants emerge and disappear. Other times, new variants persist. Numerous variants of the virus that causes COVID-19 are being tracked globally during this pandemic.

a. Omicron - B.1.1.529 (Fig. 11)

First identified: South Africa Spread: Spreads more easily than other variants. CDC is working with state and local public health officials to monitor the spread of Omicron.

Symptoms: same as covid-19 **Severe illness and death:** Data suggest that Omicron is less severe in general. However, a surge in cases may lead to significant increases in hospitalization and death. More data are needed to fully understand the severity of illness and death associated with this variant.

b. Delta - B.1.617.2

First identified: India Spread: May spread more easily than other variants.

Symptoms: Same as covid-19

Severe illness and death: May cause more severe cases than the other variants

Vaccine: Breakthrough infections in people who are vaccinated are expected, but being up to date on recommended vaccines is effective at preventing severe illness, hospitalizations, and death. Early evidence suggests that people who are up to date with their vaccines who become infected with the Delta variant can spread the virus to others. All FDA-approved or authorized vaccines are effective against severe illness, hospitalization, and death

History

The virus is thought to be of natural animal origin, most likely through spill over infection. There are several theories about where the index case originated and investigations into the origin of the pandemic are ongoing. Phylogenetic estimates that SARS-CoV-2 arose in October or November 2019. A phylogenetic algorithm analysis suggested that the virus may have been circulating in Guangdong before Wuhan. Evidence suggests that it descends from a coronavirus that infects wild bats, and spread to humans through an intermediary wildlife host. The possibility that the virus was accidentally released from a laboratory is also under increasingly active consideration. U.S intelligence agencies found that the virus was not developed as a biological weapon and that it is unlikely for it to have been genetically engineered.

The first confirmed human infections were in Wuhan, Hubei, China. A study of the first 41 cases of confirmed COVID-19, published in January 2020 in *The Lancet*, reported the earliest date of onset of symptoms as 1 December 2019. Official publications from the WHO reported the earliest onset of symptoms as 8 December 2019. Human-to-human transmission was confirmed by the WHO and Chinese authorities by 20 January 2020. According to official Chinese sources, these were mostly linked to the Huanan Seafood Wholesale Market, which also sold live animals.

In May 2020, George Gao, the director of the CDC, said animal samples collected from the seafood market had tested negative for the virus, indicating that the market was the site of an early super spreading event, but that it was not the site of the initial outbreak. Traces of the virus have been found in wastewater samples that were collected in Milan and Turin, Italy, on 18 December 2019. By December 2019, the spread of infection was almost entirely driven by human-to-human transmission. The number of COVID-19 cases in Hubei gradually increased, reaching sixty by 20 December,

Covid-19 transmission

We know that the disease is caused by the SARS-CoV-2 virus, which spreads between people in several different ways.

- Current evidence suggests that the virus spreads mainly between people who are in close contact with each other, for example at a conversational distance. The virus can spread from an infected person's mouth or nose in small liquid particles when they cough, sneeze, speak, sing or breathe. Another person can then contract the virus when infectious particles that pass through the air are inhaled at short range (this is often called short-range aerosol or short-range airborne transmission) or if infectious particles come into direct contact with the eyes, nose, or mouth (droplet transmission).
- The virus can also spread in poorly ventilated and/or crowded indoor settings, where people tend to spend longer periods of time. This is because aerosols can remain suspended in the air or travel farther than conversational distance (this is often called long-range aerosol or long-range airborne transmission).
- People may also become infected when touching their eyes, nose or mouth after touching surfaces or objects that have been contaminated by the virus.

Symptoms

People with COVID-19 have had a wide range of symptoms reported – ranging from mild symptoms to severe illness. Symptoms may appear 2-14 days after exposure to the virus. People with these symptoms may have COVID-19:

- Fever or chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Muscle or body aches
- Headache
- Loss of taste or smell
- Sore throat
- Congestion or runny nose
- Nausea or vomiting
- Diarrhoea

Risk of Covid-19

Coronaviruses spread among people through droplets from coughs, sneezes, or breathing. The droplets may land on another person on an item such as a door handle. If someone else touches the handle, the virus may pass on to them if they touch their mouth, nose, or eyes. Once inside the body, coronaviruses mostly affect the respiratory system, including the nose and lungs. However, some viruses and the immune reaction they trigger can have a wider impact. Around 80% of people with COVID-19 recover without needing specialist treatment, often in about 2 weeks. These people may experience mild flu-like symptoms but in others, COVID-19 has a severe impact on the lungs, leading to:

- difficulty breathing
- low levels of oxygen in the blood
- lung injuries
- pneumonia
- pulmonary oedema

Having COVID-19 can increase the risk of damage to the:

- blood
- kidneys
- nervous system and brain
- cardiovascular system
- gastrointestinal system

COVID-19 can also cause:

- blood clots
- brain fog
- mood changes
- visual disturbances
- kidney damage
- heart palpitations

Prevention

Important Ways to Slow the Spread:

- Wear a mask that covers your nose and mouth to help protect yourself and others.
- Stay 6 feet apart from others who don't live with you.
- Get a COVID-19 vaccine when it is available to you.
- Avoid crowds and poorly ventilated indoor spaces.
- Wash your hands often with soap and water. Use hand sanitizer if soap and water aren't available.

a. Wear a mask

Wear a mask, make sure you can breathe easily. maintain distancing at list. Stay 6 feet away from others

Inside your home:

Avoid close contact with people who are sick. Keeping distance from others is especially important for people who are at higher risk of getting very sick.

b. Get Vaccinated

Authorized COVID-19 vaccines can help protect you from COVID-19. You should get a COVID-19 vaccine when it is available to you.

Once you are fully vaccinated, you may be able to start doing some things that you had stopped doing because of the pandemic.

c. Avoid crowds and poorly ventilated spaces

Being in crowds like in restaurants, bars, fitness centres or movie theatres puts you at higher risk for COVID-19. Avoid indoor spaces that do not offer fresh air from the outdoors as much as possible. If indoors, bring in fresh air by opening windows and doors, if possible.

d. Wash your hands often

Wash your hands often with soap and water for at least 20 seconds especially after you have been in a public place, or after blowing your nose, coughing, or sneezing.

It's especially important to wash

- Before eating or preparing food
- Before touching your face
- After using the restroom

- After leaving a public place
- After blowing your nose, coughing, or sneezing
- After handling your mask
- After changing a diaper
- After caring for someone sick
- After touching animals or pets
- If soap and water are not readily available, use a hand sanitizer that contains at least 60% alcohol. Cover all surfaces of your hands and rub them together until they feel dry.
- Avoid touching your eyes, nose, and mouth with unwashed hands. Cover coughs and sneezes o Immediately wash your hands with soap and water for at least 20 seconds. If soap and water are not readily available, clean your hands with a hand sanitizer that contains at least 60% alcohol.

Clean and Disinfect

Clean high touch surfaces daily. This includes tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, and sinks.

If someone is sick or has tested positive for COVID-19, disinfect frequently touched surfaces. Use a household disinfectant product from EPA's List N: Disinfectants for Coronavirus (COVID-19) according to manufacturer's labelled directions.

If surfaces are dirty, clean them using detergent or soap and water prior to disinfection.

Be alert for symptoms. Watch for fever, cough, shortness of breath, or other symptoms of COVID-19.

Take your temperature if symptoms develop.

Don't take your temperature within 30 minutes of exercising or after taking medications that could lower your temperature, like acetaminophen.

B. Impact

a) With covid restrictions gone, restaurants see rise in footfalls". With state governments removing Covid related restrictions on restaurants dining, hotels are looking at a sharp pick in restaurants footfalls in Q4 of this fiscal in general and march in particular: Hotels brand with a strong F&B presents like ITC Grand Chola, Sheraton Grand Chennai, Accor and Mohindra Holidays are already seeing their weekend and weekday F&B footfalls exceeded 2019 pre- pandemic levels and QIFY 22-23 is expected to be even better.

With the reduction of Covid restrictions domestically across major cities ,we are observing a substantial increase in footfalls at restaurants across our properties in India .While we ended 2019 on a positive note, we also realized that Food and Beverage had the mainstay business for hotels battling with reduced occupancy Sengupta (2020).

b) Job loss during Covid-19 led many to beg study One fifth do part – time work, says Delhi Govt & HID Study A comprehensive socio-economic analysis of the state of those found begging of the street of the national capital classifies more than half of those surveyed (50%) as “new entrants “.While most of those surveyed were forced to take up begging largely due to poverty, unemployment, illiteracy and factor like old age, disability and illness, the focused group discussions across district found that several who have lost their jobs and livelihood due to the Covid-19 pandemic were also force to begging. Those forced to take up begging due to lose of work during pandemic including certain categories such as women involved domestic works, temporary work in hotels, drivers and security guard s. One of the case studies,that part of the HID report, reflects the challenges faced by many good job holder were before luck down laid off their job and own company and faced a dire financial crises. Unable to pay their rent and other expences, some of them entered into a state of extreme depression and even tried committing suicide. Their neighbors saved them, even some of them were unable to pay their medical bills often thrown out of the hospitals as well.

The survey shows that those found begging were found highly concentrated at religious places, streets or footpaths, traffic signals, and market places. Beggars are around 28,000 taken into account.

c) Older adults and people who have severe underlying medical conditions like heart or lung disease or diabetes seem to be at higher risk for developing more serious complications from COVID-19 illness. The growing challenge for people discharged from Covid-19 wards is complete recovery. While many struggle to overcome residual symptoms such as pain and fatigue, doctors in emergency rooms say there is an increase in the number of people being wheeled in with strokes, heart attacks and life-threatening clots in blood vessels. In some cases, chronic conditions such as diabetes and hypertension both risk factors have worsened.

d) Impact of Covid -19 on women: Stigma and discrimination are very common among Covid patients. They experienced stigma and discrimination in many other spheres, including funeral proceeding, employment discrimination, broken confidentiality and community gossip and speculation. Even unnecessarily work load of whole family.

e) Young adults experience higher loneliness than older people, says study, family distress and disorders were also associated with higher levels of loneliness experienced during the lockdown and to assess the impact the family distress and discord, young people are used to a lot of social interactions outside the home and that has been fully cut down (2020).

f) In Hosp Big B blogs on mental struggle of Covid 19 Patients Mumbai: Actor Amitabh Bachchan, who is in hospital for Covid-19, has written about the "mental health struggles" of coronavirus patients who are placed in isolation as part of the treatment. In a blog posted late Saturday, Bachchan, who was admitted to Nanavati Hospital, Juhu, on July 11, wrote, "The mental state sparks from the stark reality that the Covid patient, put in hospitalised isolation, never gets to see another human for weeks."

While doctors and nurses are around, their personal protection equipment (PPE) makes it difficult for patients to connect. "There are the nurses and the doctors on visit and medicine care... but they ever appear in PPE units... you never get to know who they are, what are their features, expressions because they are forever covered in the units for protection... all white beings about... almost robotic in their presence," the 7-year-old superstar wrote.

The World Health Organization and doctors have said the Covid pandemic could be followed by a pandemic of mental illness brought on by isolation and the fear of social, emotional and economic well-being. Bachchan's blog mentions the need for counselling as well as the stigmatization associated with Covid. "Patients are afraid to be in public for fear or apprehension of being treated differently..treated as one that has carried the disease... a pariah syndrome." The post-Covid treatment could drive them "into deeper depression and into the loneliness that they have just come out of he writes (2021).

g) Kandhamal turmeric growers seek hike in procurement price Turmeric growers of Kandhamal district, who suffered a huge loss for the past two years due to Covid-19, have demanded the procurement price of their produce to be increased from Rs 60 per kg to Rs 100. Thousands of growers had hoped to make a profit after the district's organic turmeric received the geographical indication (GI) tag in 2019. However, the farmers' dream shattered after the pandemic hit.

Conclusion

This study analyses the virus COVID-19, its variants, prevention and its severe impact on the society. The empirical method employed in this study includes data from government data bases, national newspaper and various medical journals. The study encompasses the Indian scenario but is centered in Odisha. In this research we have successfully identified the trajectory of the virus from its origin and also the various research that has been done on it. We have marked a number of risks and have listed all possible solutions for its prevention. There has also been a certain space allocated for the impact of the virus on women. As a result, this virus has undoubtedly altered the lifestyle, economy and social course on an Indian as well as on a global level

Suggestions

BMI is not perfect measure but is still a useful, simple and universally accepted benchmark. Exercise weight has always been associated with medical risk such as cardiac disease, diabetes high blood pressure, joint issues and stroke. Now we can add Covid-19 to the list as well. However while we recommended global lockdowns, mask mandates and social distancing. We have not have the guts to publicly acknowledge what also need to be done - people need to lose some weight to be safe from Covid-19 (2021).

In the country there are 60% of people turned to super foods to build their immunity since the pandemic broke out if we are looking to super foods, like walnuts: it has been linked with weight loss, improved brain power, heart health and fertility, rich in fibre, folate and polyphenols, they also help improve gut health with probiotic bacteria. Walnut can eat with salads. Beetroot: hailed for its ability to support the liver. Amaranth: it is full of fibre, proteins, antioxidants and vitamins that are vital for immune support. Fermented foods: they are essentials for keeping our guts and immune system balanced. Daily mirror (2021)

References

1. "Chatterjee Sweeta (2021) Will 2022 be the year we stop worrying about Covid waves?" Times of India, Friday November 26, 2021.
2. Pradhan Ashok (2021) "Study finds Difference in Death Pattern in 2 weeks" Times of India, Dated 2/11/2021
3. Narayan Puspa (2021) "Covid cured, but patients report serious ailments" Times of India, Monday, July 27, 2021.
4. Times News Network (2021) "In Hosp, Big blogs on mental struggles of Covid -19 patients" Times of India, Monday, July 27, 2021.
5. Mohanty Hrushikesh (2022) "Kandhamal Turmeric growers see hike in procurement price, Times of India, Tuesday, May 10, 2021.
6. Basu Arani (2022) "India team hit by Covid outbreak", Times of India, Tuesday, February 3, 2022.
7. Sengupta Nandini (2020) "With covid restrictions gone, restaurants see rise in footfalls" Wednesday May 25, 2020.
8. Pandit Ambika (2021) "Job loss during Covid -19 led many to beg" "Times of India, Tuesday June 10, 2021
9. Menon Priya (2020) "Young adults feel lonelier during lockdown: Study", Times of India, Friday July 17, 2020.
10. Daily mirror (2021) "Meet these four immune – boosting supports", Times of India, Wednesday Feb 17, 2021.

CHAPTER 35

DECONSTRUCTING CYBORGIAN IDENTITY: A STUDY BASED ON THE DYSTOPIAN WORLD IN 'TERMINATOR 3: RISE OF THE MACHINES'

MILAN KUMARI PANDA

*Bachelor's Student at English Department
Kalinga Institute of Industrial Technology (KIIT), Odisha, India*

Dr. JYOTSNARANI PANDA

*Counsellor in BJB Autonomous College, IGNOU
Code- IG211139810, Bhubaneswar, Odisha*

Abstract

This study aims to analyse the stereotyped construction of Cyborgian identity as necessarily an aggressive "Other". The identity construction in the movie "Terminator 3: Rise of the Machines" is crucial to this study. The main objective is to investigate the impact of Society, Science and Human intelligence in the creation of such identities. In this study, the framework from Donna Haraway's Cyborg Manifesto is used. Haraway acknowledges the existence of Cyborgs in a prejudiced society in her essay. Future researchers will be able to evaluate and comprehend cyber literature from a fresh perspective thanks to this discovery.

Keywords: *Cyborg, Dystopia, Otherness, Identity Construction*

Introduction

The term 'Cyborg' encompasses a diverse range of fictional and actual creatures, hybridisation of biological bodies and technological augmentations. Cyborg, this term was first put together by Manfred Clynes and Nathan S. Kline. Cyborgs have intrinsically enhanced abilities as their mechanism is receptor-response centric. Cyborgs are culmination of two words "cybernetics" and "organism". The 1950's and 1960's gave way to the modern films and fiction in which one of the pioneers is the series of 'Terminator' wherein a dystopian world is showcased (Law & Moser 3203). This aggressive intruder stereotype is the product of capitalism, advent of artificial intelligence, evolution of technologies, space explorations in Science (Haque et al. 3104). The Cyborgian identity is innately threatening in nature.

Cyborgs serve as the bridge between fact and fiction, virtual and real, natural and artificial. Their identities are generally disoriented in nature. A number of factors determine this. The concept of Identities is very important in Superhero comics (Ruge 4). One major determining factor is the patriarchal influence of the society. The misinterpretation or underrepresentation of female Cyborgs is one such instance. These factors result in one singular strand of Identity pertaining to the norms revolving around females like the "femme fatale".

Dona Haraway's stance on Cyborgs in her CyCyborg and Cyberspace are employed as metaphors to represent the cultural, temporal, and spatial dislocation of postmodernism. (Wolmark 8).

This research paper's major goal is to expose the common misconceptions about cyborgs. The Cyberdyne system in "Terminator 3: Rise of the Machines" has been destroyed, and John Connor, the movie's human protagonist, is running away from Skynet, the evil AI. Since John could not be found in the past, Skynet sent T-X, a female advanced shape-shifting terminator. To safeguard John and his future bride Kate Brewster, the human resistance sends back a modified T-850 Terminator, a less sophisticated endoskeleton.

Cyborg Manifesto stands against such aggressive and threatening representations of Cyborgs. She strongly stands against categorising Cyborg as the "other". Haraway rejects the rigid boundaries between humanity and technology have mined up their trajectories to such an extent that it is difficult to maintain such singularity of each. She cites that since Cyborgs are part of human identities and are creations of human beings hence there is no reason to fear them. Thus undermining the concept of threat attached with Cyborgian identity.

Research Methodology

To understand the concept of identity construction of T-850 Terminator played by the actor Arlonld Schwarzenegger and T-X, the female Cyborg played by KristannaLohen.

A Cyborg is a cybernetic organism , a mix of machine and organism and both a creature of fiction and social reality,according to her definition of the term (Haraway 149).The term “Cyborg” refers to a character who represents the best possible symbiosis of Science and Technology.A human being may be combined with a machine to preserve or improve their natural functions (Smith 4).This study uses Donna Haraway's "A Cyborg Manifesto, Science, Technology, and Socialist Feminist in Late Twentieth Century" Cyborg theory.(1985).Haraway, who has been active since 1944, is a well-known feminist, cultural theorist, and expert in science and technology. (Haque et al. 3107).

According to Haraway, everyone is a Cyborg (Haraway 150). She makes the case that a cyborg is a metaphor for all interactions between humans and machines (Haque et al.3108).These include artificial intelligence , reproductive technology and human machine hybridisation.The way we experience the world has been completely altered by Science and Technology. The evolution and advancement of Science and Technology has diminished the distinctive border between humans from its “other” (Haraway 151-153).A species that jars with the lines that separate humans is considered “other” in the context of human beings . Even the boundary between humans and animals has been dissected by US scientists .According to Haraway“language,tool use, social behaviour ,mental events, nothing really convincingly settles the separation of human and animal”(Haraway 152-153).

Haraway also notes how cyborgs are feminine in gender and different from humans because of their hybrid nature. Haraway blames capitalism for the dominance of one class (males) over others. (females). Cyborg is a significant character because he reveals the contradictions of capitalism. (Haque et al. 3109).

So, according to Haraway, the growth of science and technology has perverted the traditional opposition between the sexes, and the emergence of the cyborg presents an opportunity to abolish the existing gender hierarchies. She claims that these dualisms face intriguing challenges from high-tech culture.

Analysis

The gender based attributes have been imparted on Cyborgian identity. Cyborg is described by Haraway as a being without gender. State socialism, militarism, and patriarchal capitalism gave rise to cyborgs. (Haraway 151). The Terminator 3: Rise of the Machines showcases a dystopian world instead of an utopian world. A very damaged future also referring to the Judgement day has been shown again reiterating the idea of Cyborg as an enemy to human existence and they want to exert their dominance over human population or complete annihilation over it. According to Harway every interaction between humans and machines stands as a Cyborg hence to present Cyborgs as threatening to the human existence should be undermined. Often events like Judgement day are used up whenever we come across some spatial condition which includes human - cyborg interaction which again is proof of the stereotype conferred upon Cyborgian identity.

Additionally, Haraway discusses the idea of broken identities. "Identities seem contradictory, partial, and strategic," she says. (Haraway 16). The identity of humans and cyborgs changes drastically.Certain patriarchal attributes are conferred on women more peculiarly a human who identifies as female is always chosen over a female cyborg again establishing the patriarchal notion of choosing one woman over the other.This is highlighted in the movie where Kate Brewster, the wife of John Connor is always preferred over T-X the invincible terminator.

T-X is a very strong terminator. She is a gynoid assassin and infiltrator.T-X has the ability of shape-shifting, generally this character is attributed to the factor that women are considered deceptive by nature and the reference to cross-dressing generally associated with women in the Victorian era. Mechanical women in cybernetics exhibit patriarchal attitude to rule a perfect woman.In science fiction literature, the depiction of female Cyborgs demonstrates how patriarchy exerts control over the feminine other. (Haque et al. 3110).

T-X is shown as way more stronger than T-850. However,in the end despite being bestowed with such strong characteristics she is killed by T-850 and her end marks as a space for a glorified sacrificial act for T-100. Necessarily T-100 identifies as male.the invincible strong personality of T-X bestowed by the showmakers establishes the concept of “femme-fatale”, where they are too powerful and this becomes their ultimate downfall.The idea that power cannot

be controlled by women is surfaced here. The red fitted suit , the nude makeup , clean part of the hair and the strong gaze on the face all indicate the carnal satisfaction of the audience when they see female Cyborg T-X. It is as if the Cyborg has been constructed for the gaze of the male audience.

Conclusion

This research paper analyses the Cyborgs identity construction in Terminator 3: Rise of the machines. Donna Haraway's Cyborg theory is employed here in this novel. Women are exploited in the society according to Haraway because of the binary system that results from the patriarchal desire for dominance. Haraway introduces the idea of fractured identities . A Cyborg is a technological and natural hybrid that can either be male or female. As a result it has the power to alter global perceptions and challenge the dominance of a particular group over others.

This research has several limitations because only one movie is examined from the standpoint of gender stereotypes. The result of this study cannot be applied to all branches of cybernetics. Future studies must examine and include other science fiction, movies etc.

References

- 1) Ahsan, Syrrina & Haque, Ali & Saeed, Asia. (2020). From Cyborg to Other: Reframing Identities within the dystopian world in Marge Piercy's *He, She and It*. 3104-3112.
- 2) Ruge, Mary A. "From Subject to Cyborg: Reframing Identity within Female Spaces in Neil Gaiman's *Black Orchid* and *A Game of You*." (2017).
- 3) Serlin, David. 'Engineering Masculinity: Veterans and Prosthetics after World War Two.' *Artificial Parts, Practical Lives: Modern Histories of Prosthetics*. Eds. Katherine Ott, David Serlin, and Stephen Mihm. New York: New York University Press, 2002. 45-74.
- 4) Smith, Susan Ursula Anne. *Shifting (A) Genders: Gender, Disability and the Cyborg in American Women's Science Fiction*. Diss. University of Leicester, 2010.
- 5) Vlasopolos, Anca. 'Technology as Eros's dart: Cyborgs as Perfect (Male?) Lovers.' *The International Review of Science Fiction*. 73 (1998): 59-66.
- 6) Wolmark, Jenny. *Cybersexualities: A Reader in Feminist Theory, Cyborgs and Cyberspace*. Edinburgh University Press, 2000.
- 7) Law, John, and Ingunn Moser. "Cyborg." (2001): 3202-3204.
- 8) Lefanu, Sarah. *In the Chinks of the World Machine*. London: The Women's Press, 1988.
- 9) Lestienne, S. "Identities in Franz Kafka's *Metamorphosis* (1915) and *In the Penal Colony* (1919)". *International Review of Literary Studies*, vol. 2, no. 1, Nov. 2020, pp. 32-41, <https://irlsjournal.com/ojs/index.php/irls/article/view/15>.
- 10) Mies, Maria. *Patriarchy and Accumulation on a World Scale: Women in the International Division of Labour*. London: Zed Books, 1986.
- 11) Neverow, Vara. "The Politics of Incorporation and Embodiment: Woman on the Edge of Time and *He, She and It* as Feminist Epistemologies of Resistance." *Utopian Studies* 5.2 (1994): 16-35.
- 12) Pierce, John J. *Foundations of Science Fiction: A Study in Imagination and Evolution*. Westport: Greenwood Press, 1987.
- 13) Roberts, Robin. *A New Species: Gender and Science in Science Fiction*. Urbana and Chicago: University of Illinois Press, 1993.

CHAPTER 36

हिन्दी लेखिकाओं की कहानियों में नारी चेतना और गरिमा की अभिव्यक्ति

डॉ. शेख.बेनज़ीर

बीज शब्द : संघर्ष, पहचान, संवेदना, अस्तित्व

पुरातन काल से नारी अपनी पहचान के लिए संघर्ष रत रही है। आज की कहानियों एवं उपन्यासों में सदियों पुराने संघर्ष की प्रतिध्वनियाँ सुनाई पड़ती हैं। भारतीय नारी की अस्मिता और अक्षुण्ण रखने के लिए उसके प्रयास निश्चित ही कथाकार के सरोकार रहे हैं। लेकिन इस छटपटाहट में अक्सर हताशा, कुंठा और बेबसी हाथ लगी है। कई कहानियाँ इन असफलताओं को दुत्कारते हुए नई रोशनी के लिए अपना वर्तमान दाव पर लगाने प्रेरणा देती रही हैं। कथा लेखन में कृष्णा सोबती, शशिप्रभा शास्त्री, मृदुला गर्ग, राजी सेठ, नासिरा शर्मा, मेहरुन्निसा परवेज, प्रभा खेतान, चित्रा मुद्गल, चन्द्रकान्ता, इंदिरा दीवान, सूर्यबाला आदि के नाम उल्लेखनीय हैं। लेखिकाएँ बहुत ही निस्संग रूप में समाज में अपनी स्थिति को पहचानने और विश्लेषित करने की रचनात्मक कोशिश कर रही हैं। पुरुष लेखक भी ईमानदारी के साथ अपनी रचनाओं में आधुनिक नारी को प्रस्तुत करने का प्रयास कर रहे हैं। साहित्य में नारी के चित्रण का प्रश्न उठता है तो अनुभव की प्रामाणिकता की दृष्टि से नारी के संबंध में पुरुष लेखन की विश्वसनीयता असंदिग्ध है। पर इस कसौटी पर तो केवल आत्मकथा ही लिखी जा सकती है। वस्तुतः साहित्यिक संवेदना का क्षेत्र और स्वरूप अव्याख्येय होने की हद तक जटिल होता है। अतः यह मानकर चलाना ही युक्ति संगत है कि स्त्री हो या पुरुष, काव्यात्मक संवेदना के स्तर पर स्वः निजी सीमाओं से ऊपर उठकर एक विशेष सर्जनात्मक व्यक्तित्व बन जाता है और यह ही बड़ा या छोटा लेखक बनता है।

नारी अधिकारों और उन सवालों की मांग करने वालों से क्षमाशर्मा 'स्त्री का समय' में कहती है कि "आखिर आदमियों को यह हक क्यों होना चाहिए कि वे ये बताये कि औरतें किस तरह का आचरण करें।"१ क्षमा सुधारवादी दृष्टिकोण से स्त्री सत्ता और स्त्रीवादी विचारधारा का पक्ष भी लेती है। मृदुलागर्ग ने साहित्यिक दर्पण में नारी के बदलते स्वरूप को देखने की कोशिश की है। "नारीवाद की नई परिभाषा गढ़ी है। इसे वह 'देसी नारीवाद' कहती है। वैसे आज आवश्यकता भी इसी की है कि पूर्णतः भारतीय परिप्रेक्ष्य में स्त्री - विमर्श किया जाय।"२

जिंदा कौम निरंतर परिवर्तन के दौर से गुजरती है। वैसे दुनिया में परिवर्तन ही शाश्वत है। परिवर्तन के हर मोड़ पर एक कहानी होती है। एक पीढ़ी इस कहानी को जीती है और शब्दबद्ध करती है। लेकिन तमाम परिवर्तनों के बावजूद, एक परिवर्तन के साथ एक त्रासदी का जुड़ना कुछ लोगों की नियति बन जाती है। पुरातन काल से लेकर आधुनिक काल नारी अपनी पहचान के लिए संघर्ष - रत रही है। आज की कहानियों में सदियों पुराने संघर्ष की प्रतिध्वनियाँ सुनाई पड़ती हैं। दर्द झेलना स्त्री की नियति बन गया है। इन मानसिकताओं के बीच स्वतंत्रता की अभिलाषा कहीं दम तोड़ती सी जान पड़ती है। मगर स्त्री मुक्ति का रास्ता स्वयं संघर्षों से ही निर्मित होगा। सीमोन द बोउवार ने भी स्त्री मुक्ति को इसी तरह परिभाषित करते हुए स्त्री अस्मिता की तलाश की है। "किसी समाज सुधारक या मसीहा द्वारा स्त्री की मुक्ति का मार्ग नहीं निकलेगा। यह संघर्ष प्रारंभ होगा अपने अस्तित्व की चेतना से।"३

भूख आदमी की प्राथमिक आवश्यकता है। भूख से उपजी बेबसी सबसे पहले आदमी की अस्मिता का हनन करती है, बाद में उसके अस्तित्व का शोषण करती है। 'भूख' जो न करवाय वह सब कुछ करवाती है। यदि इसका तालुक्ख नारी जगत से जुड़ा हो तो इसकी असहायता और भी बढ़ जाती है। इस विषय को केंद्र में रखकर चित्रा मुद्गल ने जो कहानी लिखी है, वह बहुत ही संवेदनशील और दिल दहलानेवाला है। 'भूख' की नायिका है लक्ष्मा, जो अपनी रोजी-रोटी का जुगाड़ करने मुंबई आई है अपने बच्चों के साथ। लेकिन एक लम्बी बेकारी उसकी रोटी ओझल कर देती है और विवश होकर वह अपना बच्चा एक भिखारन को

दो रुपये रोज के किराये पर दे देती है | बच्चे का जुगाड़ कर देती है | पर अनजाने में उस बच्चे की जिन्दगी दाव पर लगा कर अपने आप को विवश पाती है |

डॉ.कुसुम नियोगी की 'और वह पढ़ गई' एक दलित लड़की की कहानी है | दलित होने के नाते जिन-जिन कठिनाइयों का सामना करना पड़ता है, उन सबका सजीव चित्रण इस कहानी प्रस्तुत है | शिक्षा के क्षेत्र में दलितों पर लगाए जानेवाले प्रतिबंधों का विरोध करते हुए उनके उद्धार को लक्ष्य बनाकर लिखी गई कहानी है | कहानी की नायिका चेतना कहती है "हमारी बस्ती तो दारुबाजों की, जुआरियों की बस्ती है में तो पढ़ना चाहती हूँ | लगन तो आखिर लगन ही होती है |"४ परंपरा का विरोध कर आत्मसम्मान पाने के लिए तथा विद्या - बुद्धि एवं विवेक के बल पर अपने आप को सार्थक साबित करने की कोशिश में कार्यरत दलित नारी को डा.सुशीला टाकभौरे ने 'सिलिया' कहानी में प्रस्तुत किया है | सिलिया कहती है कि "अपना सम्मान हम खुद बढ़ायेंगे | मैं बहुत आगे तक पढ़ाई करूंगी, पढ़ती रहूंगी, शिक्षा के साथ अपने व्यक्तित्व को भी बड़ा बनाऊंगी |"५

आजादी के बाद नारी की जीवन स्थिति, उसके जीवन मूल्य, उसके मनोभाव तेजी से बदलते गये | नारी में तार्किक बुद्धि का उदय हुआ | स्त्री शिक्षा को अधिक बढ़ावा न मिलने के कारण स्त्रियों की समस्याओं का जिक्र और हल पुरुष ढूँढ़ने लगे | पर धीरे - धीरे नारी जागरण के पश्चात् नारी अपने अधिकारों के प्रति सचेत हो गई | महिला उपन्यासकारों ने अपनी रचनाओं के माध्यम से निजी अनुभव, संवेदनाओं या कल्पनाओं की भरमार को प्रस्तुत किया | मन्नुभंडारी महिला लेखिकाओं का प्रतिनिधित्व करते हुए कहती है - "भोगे हुए जीवन की अस्मिता को बचाना है | इस युग से इसकी आशा करना ही मूर्खता है, क्योंकि आज जिन्दगी का हर पहलू, हर स्थिति, हर संबंध, एक समाधानहीन समस्या बनकर ही आता है, जिसे सुलझाया नहीं जा सकता, केवल भोगा जा सकता है, जिसमें आदमी निरंतर टूटता बिखरता चलता है |"६

रजनी पनिकर की कहानियों की नारी अन्याय को सहन न कर उसका विरोध करती हुई दिखाई देती है | 'सिगरेट के टुकड़े' की उमा पति के सिगरेट की आदत से परेशान होकर उसका विरोध करती है | सुलेखा कहानी की सुलेखा पति से तंग आकर दूसरी शादी कर लेती है | समाज के बंधनों को कुछ हद तक ही सहा जाता है | अगर उन बंधनों से दम खुटने से बंधन मुक्त होना ही ठीक है | कचन लता सब्बरवाल नारी की गुर्बलता का कारण उसकी आर्थिक विपन्नता को मानती है | आत्मसम्मान कहानी के संदर्भ में लेखिका कहती है कि 'सच तो, पत्नी पति की संपत्ति मात्र ही तो है | उसका अधिकार है उसी तरह जैसे अपने घोड़े पर | वह दुःख की साथिन नहीं, केवल अधिकार की वास्तु है |'७

मेहरुन्निसा परवेज ने दर्द को समझा है इस कारण बखूबी चित्रित भी किया है | 'खामोश की आवाज' की नायिका शिक्षित और कामकाजी है, वह पुरुष की दासता को न स्वीकार कर आधुनिक नारी के रूप में दिखाई देती है | मालती जोशी की कहानी 'ढाई आखर प्रेम का' की नायिका आदर्श प्रेमिका है, प्रेमी के मर जाने के बाद उसके वृद्ध माता-पिता का बिना विवाह के भी सहारा बन जाती है आदर्श बहू का उत्तरदायित्व निभाती है | मन्नु भंडारी की कहानी 'क्षय' की कुंती भी आधुनिक महिला की भांति घर बाहर के काम को समन्वय करती हुई पिता और भाई का सहारा बनाती है | मृदला गर्ग ने 'खरीदार' कहानी में साहसी कामकाजी नारी का चित्रण किया | मृणाल पांडे की 'लकीरें' की नायिका को कोई पसंद नहीं करते क्यों कि वह दिखने में सुन्दर नहीं है | वह चाहती है कि कोई उसे उसके इसी रूप के साथ पसंद करें, पैसे या अन्य लालच से नहीं और सपनों को साकार करने के इन्तजार में समय बिताती जाती है मगर नापसंद होकर शादी को आवश्यक नहीं मानती | प्यार जहाँ मिले वहीं शादी करना चाहती है |

सुषमा बेदी की कहानी 'विभक्त' अनन्या विदेश में पढ़ती है | भारतीय नारी के विषय में कहती है भारतीय नारी आज़ाद है, अपनी इच्छा के अनुसार जीती है | सहेलियों के द्वारा भारतीय नारी पर हुए अत्याचार की बात सुनकर कहती है कि 'मैं यह नहीं कहती कि भारत में कोई समस्या है ही नहीं पर ज्यादा समस्याएँ अमेरिका में हैं यहाँ कहीं ज्यादा बलात्कार होते हैं.... | कहीं ज्यादा घरेलू हिंसा की शिकार औरतें होती हैं |'८ आज स्त्री वैश्विक धरातल की चेतना से एक दूसरे से जुड़ी है | राजी सेठ की कहानी 'अनावृत्त कौन' में एक ऐसी ही नारी का रूप चित्रित किया है जो आधुनिक होते हुए भी पारंपरिक रीति रिवाजों को सामाजिक बन्धनों को महत्त्व देती है | उसे कैबरे डांस देखने जाने से एक दहशत सी होती है | वह कहती है 'मुझे लगता है मैं ही अनावृत्त हुई जा रही हूँ |' राजी सेठ की कहानियों में आने वाली नारी 'स्त्री-स्वातंत्र्य' के नाम पर केवल यौन - वर्जनाओं को तोड़ने का दंभ नहीं पालती वरन इस स्वातंत्र्य के साथ उत्तरदायी गांभीर्य को साथ लिए खड़ी जान पड़ती है | वे अनेक प्रश्नों से जूझती हैं - जैसे अनपढ़, असहाय और आर्थिक दृष्टि से पुरुष पर निर्भर नारी प्रश्न करना सीख लिया है | अपने अधिकारों को

पहचान कर आवाज उठा रही है | आज नारी हर क्षेत्र में कार्य कर रही है उसका अस्तित्व हर जगह, हर क्षेत्र में दिखाई दे रहा है | पारंपरिक रूढ़ियों को तोड़कर वह आधुनिकता की ओर बढ़ना चाहती है |

संदर्भ:

१. हंस पत्रिका - july 2000 - पृ - 94
२. हंस पत्रिका - march 2000 - पृ - 95
३. सीमोन द बोउवार - सेकेण्ड सेक्स : अनुवाद - प्रभाखेतान 'स्त्री उपेक्षिता' - पृ - 344
४. डा. कुसुम वियोगी - चर्चित दलित कहानियाँ - २९
५. डा. कुसुम वियोगी - चर्चित दलित कहानियाँ - ११३
६. श्रीमति चन्द्रकिरण सौनरेक्सा एवं शरतचन्द्र के नारी पात्र - डॉ. कुंतल कुमारी - पृ : ४०
७. आत्मसम्मान - कंचनलता सब्बरवाल - ६५
८. हंस पत्रिका - फरवरी, १९९४, राजेन्द्र यादव - ४१

डॉ. शोख.बेनज़ीर, हिन्दी प्राध्यापिका, पी.वी.के.एन.शासकीय महाविद्यालय,
चित्तूर-517 002 , आंध्रप्रदेश

CHAPTER 37

APPLICATIONS OF MATHEMATICS IN VARIOUS FIELDS

R. JAYA LAKSHMI

Lecturer in Mathematics, PVKN Govt College(A), Chittoor

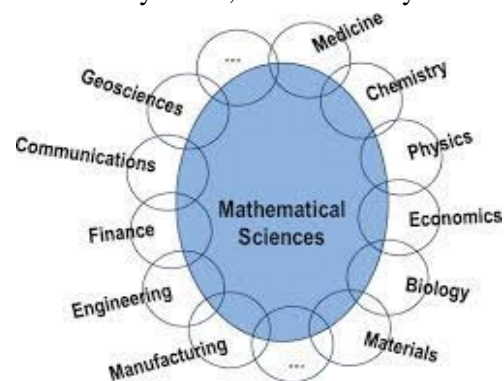
Abstract

Simple mathematics is used effectively by people in all walks of life to assist decision-making. Although there is the notional appeal of relevance to an application for the equations under study, applied mathematics has come to mean something completely different than really applying mathematics to solve an important problem in another discipline. Even those suffering from math-related anxieties or phobias cannot escape its everyday presence in their lives. From home to school to work and places in between, math is everywhere. Mathematics begins to develop very fast because of its introduction to schools. Therefore everyone have a chance to learn the basic fundamentals of mathematics in 21st century mathematics are used in Robotics, in Space research, in Biological calculation, in Field of Information Technology etc.

Keywords: Mathematics, people, application

Introduction

Mathematics is used everywhere of real world applications. The general public applies arithmetic in grocery shopping, financial mathematics is applied in commerce and economics, statistics is used in many fields, number theory is used in information technology and cryptography, surveyors apply trigonometry, operations research techniques are applied to logistics across diverse industries, and the list of applications of mathematics is endless. Yet many of the academics who call themselves applied mathematicians, residing in university mathematics departments, are all too often not applying mathematics to anything in particular at all. Whether using measurements in a recipe or deciding if half a tank of gas will make the destination, we all use math. It is a good idea, therefore, for teachers and parents of reluctant math learners to use real-world examples to ignite a spark of practical interest.



History

The history of mathematics started around 500 AD, Aryabhata wrote the *Aryabhatiya*, a slim volume, written in verse, intended to supplement the rules of calculation.

1	2	3	4	5	6	7	8	9
—	=	≡	+	h	φ	?	↳	?

Indian Numbers

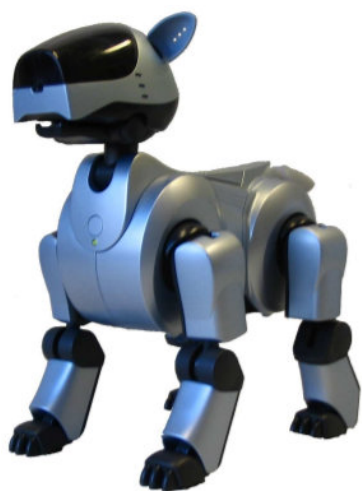
Mathematics applications in various feilds

Mathematics in Robotics:



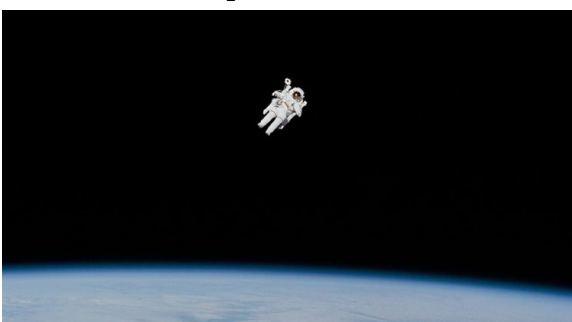
Robotics research has been increasing exponentially and marking a new industrial revolution. Today, above one million robots are operating globally and the number is growing with time. Today we have many robots with brainpower comparable or even beyond human intelligence, physical capability, perception, and behavior. And in some areas like computer-aided surgery, these intelligent machines can even surpass human capabilities. From handling hazardous materials to welding components, performing administrative tasks like, filing documents for customers, or vacuuming carpets, Robots are playing many essential roles in society. But what makes them do all the ingenious things? Several aspects of mathematics, engineering, and physics make the magic happen.

A framework to control a Robotic Dog with a set of ordinary differential equations



Non-linear dynamical systems provide creative possibilities to control the locomotion in quadruped or legged robots. The non-linear dynamical system represents the similarity with the neural structure of living beings. While a dynamical system itself is a collection of multiple systems that are linked with each other and the robot's actuators and sensors, you could consider this collection of a dynamical system as a collection of neurons in a brain. When the brain has a sensory input, it generates signal patterns. Following this approach, the neural network of animals can be obtained, and it is useful to know the behaviour of animal-like robot (Robotic Dog in this case) containing learning abilities and adaptive locomotion. To control the Robotic dog, let's create a framework with a set of dynamical systems. Let's move the robotic Dog's legs without making it walk and touching the ground.

Mathematics in Space Research



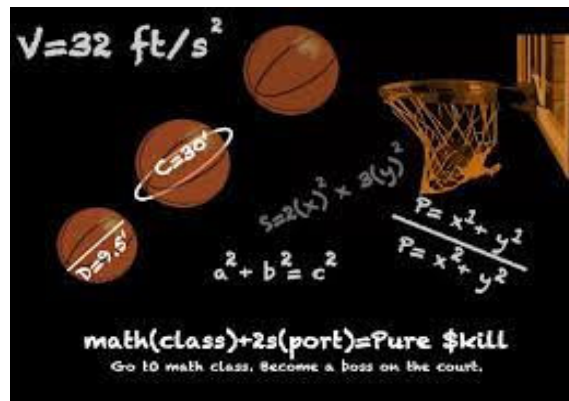
Almost all **astronomers** are scholars, which necessitates the use of **algebra**. Some are scientists who are focusing on rules governing the formation of astronomical phenomena. Others examine massive volumes of data gathered from observatories and satellites and write papers about their observations. Certain astronomers usually work as part of a team to run ground-based telescopes.

However, astronomers may spend only a few weeks each year making observations with optical telescopes, radio telescopes, and

other instruments. Over the years, satellites and other space-based instruments have provided us with astronomical data.

New **technologies** that improve analytical techniques and instruments, such as computers, telescopes, and mounts, are reappearing in ground-based research. In museums that house planetariums, a limited number of astronomers operate. These astronomers create programs that are publicly viewed and will guide the planetarium's operations.

Often astronomers use algebra in their work to achieve their goals. Without algebra, it will be difficult to find such things as the **Hubble** space telescope (HST). Algebra is used to measure speed and monitor motion rate. There is that some astronomers best represented those achievements. Without them, their use of algebraic science and technology will not flourish. knowledge of stars and space is based on those astronomers.



Mathematics in Sports

Sports are a great past-time, and getting the whole gang together to support your favorite team is a blast for the whole family! Sports can also be a great way to introduce academic concepts to kids in a fun and relatable way. Here are 5 simple ways to teach math using sports!

Keep score

For younger students, keeping score by hand is a great exercise in basic arithmetic. It's also a useful way to demonstrate that certain conditions can produce different values. For example – in basketball, a player's distance to the basket is what determines whether their shot is worth two or three points. If a player gets fouled, a free throw is only worth one point. Working with different values will provide variation in the numbers, and kids can check their work against the official score currently being displayed!

Explain sports statistics

Statistics in sports are essential, and they're often used to describe an athlete's accomplishments and overall ability. By using real sports examples, you can explain to kids why these statistics are relevant. Take baseball for example, where a player's likelihood of getting a hit is expressed through their batting average. Explain how these concepts work – if a player has a .333 batting average, that means they get 1 hit for every 3 “at-bats” on average. Not surprisingly, .333 can also be written as $\frac{1}{3}$ in fraction form. Real life examples like these are extremely effective at demonstrating how mathematical concepts are applied.

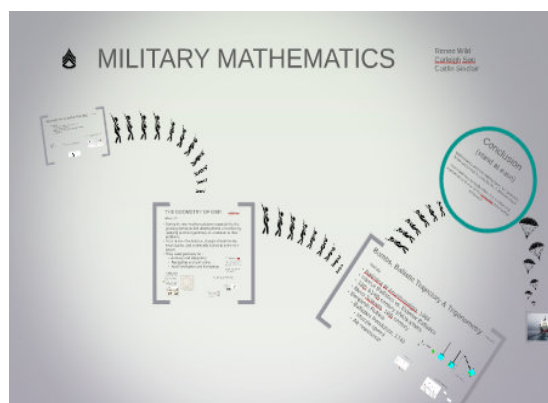
Discuss probability

We hear the term “odds of winning” constantly in the world of sports, which is a great way to introduce the concept of probability. For younger students a simple coin toss is a good way to introduce the idea of a 50-50 chance, and then move forward with more complicated figures. Playing card games is a great way to demonstrate probability and comparing a sports team's seasonal wins and losses is an easy way to explain ratios. Word problems based on real life scenarios are perfect examples to show kids when discussing the usefulness of applied math.

Mathematics in Army

Army Interests: The objective of Army basic research is to provide a well-equipped force capable of decisive victory in conflicts in the Information Age. To achieve this objective, advances in the following specific areas of application and modeling are needed:

- Advanced materials and materials manufacturing processes (aircraft skin, turbine blades, etc.)
- Behavior of materials under high loads, including failure mechanics (penetration mechanics of sabot into armor, etc.)
- Structures, including flexible structures (next generation vehicles/aircraft, parachutes, etc.)
- Fluid flow, including reactive flow (flows undergoing chemical reactions, such as fuel combustion and propellant burn, etc.)
- Power and directed energy (rechargeable personnel and vehicular sources, directed energy weapons, etc)
- Microelectronics and photonics
- Sensors (on the battlefield, embedded in equipment, etc)
- Control and optimization, distributed to user/system level
- Information processing
- Interactive simulation, distributed to user/system level (combat modelling)
- Design and validation of software and large software systems
- Automatic target recognition
- Intelligent (adaptive/anticipatory) systems; human/system interface
- Battlefield management
- Soldiers and aggregates of soldiers as systems: behavioural modelling, performance, mobility, heat-stress reduction, camouflage, chemical and ballistic protection. Advances in these areas of Army interest depend, in part, on advances in a number of mathematical science disciplines.



Mathematics in Agriculture

With the farmers' strike in full swing in India's capital, their importance and their contribution to them through their supply of food, fabrics, livestock, etc ,has never been more stark. Life without them is unthinkable!



These farmers and other associated people in agriculture need to have multiple skills to run this multifaceted business. Raw materials (like seeds, tools, fertilizers) must be purchased, certain services must be sought and products sold. All this entails an understanding of the agribusiness market and economics to ensure a profit.

Farmers work with individuals and communities to supply the needs of their farm and sell their products. Farmers must manage their funds, compare prices, and make wise financial decisions. Farmers use mathematical skills and science in their day-to-day farm activities.

For example, farmers use mathematical skills to estimate the seed amount needed, the cost to plant their crop based on the area of cultivable land they possess, to purchase equipment or tools needed and make payments for various purchases. Mathematical calculation is essential for determining the amount of tax that needs to be paid and also to track the weight of cattle, the milk the cows produce and the crop yield per season, etc.



Feeding The World -With Maths

Mathematics in Digital Technology

Digital technology is essential in teaching and learning mathematics to understand the basic concept and the way of problem solving technique.

The primary observation found that the mathematics lecturers are not fully utilizing digital technology in their classroom, while teaching engineering students.

A survey was conducted to study the barriers preventing the integration and adoption of digital technology in teaching mathematics.

Five major barriers were identified: insufficient lecturer training opportunities, inadequate technical support, and lack of knowledge about ways to integrate digital technology to enhance the curriculum, lack of time in the college or university schedule for involving Information and Communication Technology and unavailability of digital resources for the students to access the necessary mathematical materials.

To overcome some of these barriers, this research proposes a prototype system for teaching and learning mathematics.

The prototype system consists of three users; administrator, lecturer and students.

It has many amenities such as lesson planner, assignments, collection of mathematical tools, resources storage, and mathematical guidelines, latest research and projects, forum and so on. The prototype system will be prepared for teaching and learning mathematics much more interesting, inventive, innovative, exploratory, and user friendly manner.



Mathematics in Biology



Mathematical science and Biological sciences are interdisciplinary approaches in the field of scientific research. Both of them deserve a wide range of applications. The study of mathematics for biology is sometimes called mathematical biology or biomathematics to stress the mathematical side, or theoretical biology to stress the biological side. One can derive the quantitative genetics through consideration of infinitesimal effects at a large number of gene loci, together with the assumption of linkage equilibrium or quasi-linkage equilibrium. Ronald Fisher made the intensive work on fundamental advances in statistics (Example Analysis of Variance) belong to Ronald Fisher.

This achievement by Ronald Fisher was through his work on quantitative genetics. The phylogenetics is one more important branch of population genetics that led to the extensive development of Biological sciences through Mathematics.

Conclusion

I conclude that mathematics helps us in various fields like robotics, space research, sports, army, material science, agricultural, digital technology, biology etc., so by this we can say that mathematics plays a key role in daily life.

- Maths helps us have better problem-solving skills.
- Maths helps us think analytically and have better reasoning abilities.
- The reasoning is our ability to think logically about a situation.
- Analytical and reasoning skills are essential because they help us solve problems and look for solutions.

References

1. <https://mathigon.org/applications>
2. <https://www2.unbc.ca/math-statistics/real-life-applications-mathematics>
3. <https://www.phdstudies.com/article/6-reasons-to-study-mathematics/>

CHAPTER 38

LOSS OF CROP DIVERSITY, IT'S CONSEQUENCES AND MEASURES TO RESTORE

Dr. A. SASIKALA

Lecturer in Botany, PVKN Govt College (A), Chittoor, A.P

Introduction

India, a mega-diverse nation, is one of the richest nations in terms of biological diversity. India owes this to its position in tropical and subtropical latitudes. The country is also one of the 12 primary centres of origin of cultivated plants and domesticated animals. India is recognized as one of the eight Vavilovian centers of origin and diversity of crop plants and possesses more than 300 wild ancestors and close relatives of cultivated plants, which are still evolving under natural conditions. India is also a vast repository of Traditional Knowledge (TK) associated with biological resources (MoEF 2009).

Biodiversity

The term biodiversity was coined as a contraction of biological diversity by E.O. Wilson in 1985. Biodiversity may be defined as the diversity and variance of living organisms and the interrelationship in which they exist. In other words, biodiversity is the occurrence of different types of ecosystems, different species of organisms with the whole range of their variants and genes adapted to different climates, and environments along with their interactions and processes.

The biodiversity we observe this day is a result of 3.5 billion years of evolution. Unfortunately, due to humanity's overuse and overutilization of natural resources, our unsustainable development, and the resulting disturbances to the environment, we are undergoing the sixth extinction crisis on this planet and degrading natural ecosystems at a strange rate. It is noticed that the current species extinction rate is between 1,000 and 10,000 times higher than it would naturally be. The evolution of native species depends on regional climate, geography, and isolation which results in endemism in the local ecosystems. As a result of geological legacy and insularity, endemics become conservation dependent to maintain global biodiversity.

Crop Diversity

In the last 50 years, we have observed a change and convergence in diets all around the world. Large, important crops like wheat, rice, potatoes, and sugar make up this diet. Additionally, it includes crops that were unimportant fifty years ago but are now crucial, especially oil crops like soybean. While these food crops were crucial in the fight against world hunger, the globalized diet's loss of crop diversity made it harder to replace the energy-dense portion of the diet with nutrient-rich foods. Millets, rye, yams, sweet potatoes, and cassava were among the crops that experienced a drop in recent decades. The research by a group of specialists from around the world also shows that the homogenization of the global diet could be helping accelerate the rise in non-communicable diseases - such as diabetes and heart disease - which are becoming an increasing problem worldwide.

Loss of Crop Diversity

This decrease in agrobiodiversity is caused by a variety of factors. Together with rising population demands and more competition for natural resources, the decline has quickened throughout the course of the 20th century. The fast growth of industry and the Green Revolution in agriculture are the main underlying causes. This covers aquaculture, industrial fisheries, and intensive cattle production. In some production methods, genetically modified breeds and variations are used. Also, only a small number of domestic animal breeds, such as fish, are raised, and only a few aquatic species are grown in monocultures.

The augmentation of industrial patenting, and other intellectual property systems, to living organisms, has led to the extensive cultivation and rearing of fewer varieties and breeds. This results in a more consistent, less diverse, but more competitive global market.

Consequences

The farmer who grows a single crop runs the risk that conditions in a particular year might not be appropriate for it and it erodes the genetic base.

There is no alternative to the preservation and ongoing use of crop and livestock diversity in-situ, i.e. in farmers' fields and pastoralists' rangelands, for the reasons mentioned above as well as others. Regrettably, this component has received almost little attention at all in government programs, but community organizations and NGOs are beginning to pay more attention to it.

Restoring Crop Diversity

Concerns about biodiversity, sustainability, and equity will continue to be pushed aside in favor of the allure of profit unless the new economic policies and the suggested modifications to the legal framework controlling agriculture are challenged with organized action. The actions of large-scale movements and activist organizations take on crucial significance in this setting. The forces fighting against the implementation of the GATT regime, the new economic policies, and a variety of other public conflicts are essential steps in the direction of a more sustainable agricultural future. The same can be said for the growing number of direct producer-consumer relationships, in which organic, biodiverse farmers connect with urban consumers and offer them healthful grains at prices that they both agree upon.

Conclusion

However, the question of ensuring food security through biodiverse agriculture is also connected to more significant economic and social issues: where and what kind of incentives and support measures can be developed for such agriculture, what kind of consumer demand can be generated for healthy organic food, what systems of land-and-water management can be developed so that fertile agricultural lands are not sacrificed for urban or industrial use, and how much we can reverse the trend towards converting food cropping lands to short-term cash cropping.

References

1. Crop diversity and stability of revenue on farms in Central Europe: An analysis of big data from a comprehensive agricultural census in Bavaria - Robert Weigel, Thomas Koellner, Patrick Poppenborg, Christina Bogner (Published: November 19, 2018), <https://doi.org/10.1371/journal.pone.0207454>
2. Crop Diversity for Yield Increase - Chengyun Li (November 26, 2009) (<https://doi.org/10.1371/journal.pone.0008049>)
3. Crop strength through diversity – Martin S. Wolfe (NATURE-VOL 406, 17 AUGUST 2000, www.nature.com)
4. Increasing Cropping System Diversity Balances Productivity, Profitability and Environmental Health - Adam S. Davis, Jason D. Hill, Craig A. Chase, Ann M. Johanns, Matt Liebman (Published: October 10, 2012) <https://doi.org/10.1371/journal.pone.0047149>
5. Regional and global shifts in crop diversity through the Anthropocene Adam R. Martin, Marc W. Cadotte, Marney E. Isaac, Rubén Milla, Denis Vile, CyrilleViolle (Published: February 6, 2019) (<https://doi.org/10.1371/journal.pone.0209788>)
6. Resilience in Agriculture through Crop Diversification: Adaptive Management for Environmental Change - Brenda B. Lin, (*BioScience*, Volume 61, Issue 3, March 2011, Pages 183–193), (<https://doi.org/10.1525/bio.2011.61.3.4>)
7. Reviving diversity in India's agriculture by Ashish Kothari | 25 Oct 994 Seedling - October 1994 (Grain)
8. Spatial and temporal variation in crop diversity in agroforestry homegardens of southern Ethiopia - TesfayeAbebe, K. F. Wiersum, F. Bongers (*AgroforestSyst* (2010) 78:309–322)
9. The role of crop diversification in improving household food security in central Malawi - Nelson Mango, Clifton Makate, Lawrence Mapemba & MathindaSopo (*Agriculture & Food Security* volume 7, Article number: 7 (2018))

CHAPTER 39

SIGNIFICANT MEDICINAL PLANTS USED FOR DENTAL CARE AND ORAL CARE COLLECTED FROM ARDHAGIRI HILLS A SACRED GROVE OF CHITTOOR DISTRICT

M. HEMALATHA

Lecturer in Botany, PVKN Govt. Degree College, Chittoor

Abstract

Chittoor District consists of sixty six mandals. It has rich forest wealth and different tribal inhabitants in isolated hill pockets. The study area of Ardhagiri in the Chittoor district is a part of the semi-arid region. It is located between 13 0 17' - 13 0 20' Northern latitude and 78 0 57 ' - 79 0 03 ' Eastern longitude. The elevation of the hill ranges from 1250 - 1590 ft above mean sea level. The larger part of the area is composed of the peninsular granite. 290 species of angiosperms and 4 species of Pteridophyta are identified during the study period. The present study is related to medicinally important plants used in Teeth and mouth problems.

Introduction

Indian culture and traditions are very much intricate with the concern for environmental conservation. The ancient Indian system believed that the disturbance in an environmental variability will create imbalance in other aspects. To prevent such a disaster spiritual significance of plants and animals is attributed for their conservation. Sacred grooves epitomize this practice, and the concept of nature's conservation. Ardhagiri Hills, the present work area is also one such sacred grove of Chittoor district, Andhra Pradesh.

Historical Importance of the Sacred Grove

Ardhagiri Sri Veeranjaneya Swamy Temple is located one and a half km up the hill called Ardhagiri at Aragonda village, Chittoor, District, Andhra Pradesh. According to a legend, during Treta Yuga, Hanuman brought Sanjeevani parvatham in order to save Lakshmana during a war when Lakshmana fell unconscious. During the journey, half of Sanjeevani parvatham fell, and the place where it landed came to be known as Aragonda. The hill is famous with the name "Ardhagiri". There is a perennial lake called Sanjeevaraya pushkarini which is formed naturally here, is believed to possess medicinal powers of herbs of Sanjeevani Mountain. The water is fresh and pure for a long time. The consumption of water is believed to cure diseases even in acute cases. This has been proved in the cases of psoriasis, initial stages of TB, asthma, cancer and joint pains.

Materials & Methods

Field Work

Explorations were undertaken during different seasons of the year from October 2004 to September 2009 for a period of 5 years. During the present investigation sufficient care was taken for collection, preservation and in preparation of herbarium, adopting the methods as described by Santapau and Jain & Rao.

Herbarium Preparation and Study

The collections were made very intensively and carefully. Plants which are either in flowering or fruiting stage or if available both the stages with good vegetative growth were collected. Each collection of individual species was labeled with field numbers after noting the details of the plant description, habit, habitat, flower colour, smell, relative abundance of the plant and its distribution, and its associated species on a standard field note book. Immediately after collecting the specimens, they were placed in thick polythene bags. The plants so collected were poisoned by dipping the whole plant in saturated solution of ethyl alcohol with mercuric chloride and immediately they were placed

between blotting papers. A few such plant preparations were tied properly in between iron presses for drying and pressing.(1)

After about 12 hours the blotting papers were changed and the specimens were spread properly. These preparations are once again placed in pressers, tied tightly and were thus maintained for 10-15 days, regularly changing the blotting papers for drying and pressing of specimens completely. The dried and pressed specimens were then neatly pasted on standard (28x42cm) herbarium sheets. While mounting the specimens, a label for each sheet is also pasted on the right hand corner on the lower side, the label consists of the details like name of the species, family, collection place, identifiers name etc.

Identification

Provisional identifications were made with the help of Gamble's (1915-1936) 'Flora of presidency of madras'(2), Flora of Tamilnadu Karnatic (3) Flora of Nallamalai hills (4), Flora of Andhrapradesh (5), Flora of Ananthapur (6) and Chittoor district(7). Identification is confirmed after matching the sheets with authentic specimens in Herbarium, Department of Botany, S. V. University Tirupati and Madras Herbarium, Coimbatore.

Results & Discussion

Among the identified 294 species many species are showing medicinal properties, specifically the following enlisted plants are showing very significant results in curing various ailments related Teeth and Mouth problems (8, 9) (Table 1). Due to their impact in curing Teeth and Mouth problems most of these plants are widely used in Ayurvedic medicine.

Table 1: Plants used for Dental care and oral care

S. No	Botanical Name of the Plant	Common Name	Family	Medicinal use	Useful part
1	<i>Abutilon hirtum</i> (L.) Sweet, Hort.	Pala benda	Malvaceae	Toothache and tender gums	Leaf decoction
2	<i>Acacia nilotica</i> (L.) Delile	Nalla tumma	Cesalpniaceae	Swollen gums	Bark
3	<i>Acalypha indica</i> L.	Kuppinta	Euphorbiaceae	Toothache	Whole plant
4	<i>Achyranthes aspera</i> L.	Uthareni	Amaranthaceae	Toothache, Gum disorders	Leaves and roots
5	<i>Allium sativum</i> L.	Vellulli	Liliaceae	Toothache	Leaves
6	<i>Aloe vera</i> (L.) Burm.f.	Kalabanda	Liliaceae	Gingivitis and plaque	Whole plant
7	<i>Anacardium occidentale</i> L.	cashew	Anacardiaceae	Toothache, Sore gum	Whole plant
8	<i>Argemone maxicana</i> Linn.	Mexican poppy	Papaveraceae	Toothache	Seeds
9	<i>Azadirachta indica</i> A.Juss	Neem	Meliaceae	Toothache	Whole plant
10	<i>Borassus flabillifer</i> Linn.	Tadi	Arecaceae	Toothache	Root, Young Rachis
11	<i>Cajanus cajan</i> (Linn.) Millsp.	Red gram	Fabaceae	Gingivitis	Leaves, stem, seeds
12	<i>Calotropis gigantea</i> (L.) R.Br.	Calotropis	Asclepidaceae	Toothache	Roots and latex
13	<i>Capparis spinosa</i> L.	Caper bush	Capparaceae	Toothache	Root bark
14	<i>Cassia occidentalis</i> L.	kasintha	Leguminosae	Toothache	Leaves
15	<i>Celosia argentea</i> L.	Gurugu	Amaranthaceae	Mouth sores.	Seed

16	<i>Curcuma longa</i> Linn.	Turmeric	Zingiberaceae	Toothache, Gingivitis	Rhizomes
17	<i>Clitoria ternatea</i> L.	Butterfly pea	Fabeaceae	Toothache	Roots
18	<i>Cocos nucifera</i> Linn.	Coconut palm	Arecaceae	Toothache	Fruits
19	<i>Datura stramonium</i> Linn.	Dhatura	Solanaceae	Toothache	Roots
20	<i>Ficus bengalensis</i> L.	Indian fig	Moraceae	Toothache	Plant juice
21	<i>Homonoia riparia</i> Lour.	Taniki	Euphorbiaceae	mouthwash for toothache	Root decoction
22	<i>Jatropha curcas</i> Linn.	Biodiesel plant	Euphorbiaceae	Pyorrhoea tooth- ache	Fruit Tender twig
23	<i>Justicia adhatoda</i> L.	Vasika	Acanthaceae	Pyorrhoea	Leaves
24	<i>Lantana camera</i> L. var. <i>aculeata</i> (L.) Mold.	Akshinthala poolu	Verbenaceae	toothache	Fresh root decoction
25	<i>Licopersicon esculentum</i> Mill.	Tomato	Solanaceae	Mouth rashes	Fruit
26	<i>Mangifera indica</i> L.	Mango	Anacardiaceae	Sore gum	Whole plant
27	<i>Phoenix sylvestris</i> (L.) Roxb.	Pedda yitha.	Arecaceae	toothache	Root and leaf
28	<i>Ocimum canum</i> Sims	Kukka Tulasi.	Lamiaceae		Leaf juice
29	<i>Ocimum sanctum</i> Linn.	Tulsi	Lamiaceae	Mouth sores	leaves
30	<i>Oxalis corniculata</i> L.	Pulichinta	Oxalidaceae	Mouth infections	Leaf juice
31	<i>Punica granatum</i> Linn.	Pomegranate	Punicaceae	Mouth sores	Fruit covers
32	<i>Ricinus communis</i> L.	Caster oil	Euphorbiaceae	Toothache	Seeds
33	<i>Vitex altissima</i> L.	Nemali adugu.	Verbenaceae	Toothache cleansing agent	Bark decoction
34	<i>Wrightia tinctoria</i> (Roxb.) R.Br.	Reppala	Apocynaceae	Toothache	Fresh leaves

References

1. Mathew, K.M. 1981, Materials for a flora of the Tamilnadu Carnatic, Tiruchirapalli.
2. Gamble, J.S. And C.E.S. Fischer. 1957. Flora of the Presidency of Madras. Vol.1-3, Calcutta.
3. Matthew, K.M. 1981-1983. Flora of Tamilnadu Carnatic. Vol.1-3, the RapinatHerbarium, Tiruchirapalli.
4. Ellis J. L. 1987. Flora of Nallamalais. Vol. 1 & Vol. II- Botanical survey of India, Calcutta.
5. Pullaiah, T. and E. Chennaiah. 1997. Flora of Andhra Pradesh Vol. I, Vol. II, Vol.III, Vol. IV, Indian Scientific Publishers, Jodhpur, India.
6. Pullaiah, T. and N.Yasoda, 1989 Flora of Anantapur District Bishen SinghMahendra Pal Singh, New Delhi.
7. Rangacharyulu, D. 1991. Floristic Studies of Chittoor District of Andhra Pradesh, Ph. D. Thesis S.V.University, Tirupati.
8. Thammanna and K. Narayana Rao, 1990 Medicinal Plants of Tirumala TTD press, Tirupati, Andhra Pradesh, India.
9. Madhava Chetty, K., A. Sudhakar and C. Ramesh. 2006. Flowering plants of Chittoor District A.P. India, S.V. University, Tirupati.
10. N. Savithamma, P. Yugandharand M. Linga Rao 2014, Ethnobotanical Studies on Japali Hanuman Theertham- A SacredGrove of Tirumala hills, Andhra Pradesh, India.

CHAPTER 40

GOODS AND SERVICE TAX IS BOON OR BANE FOR INDIAN ECONOMY –A REVIEW

Dr. V. MASULAMANI

Lecturer in Commerce, PVKN GC(A),Chittoor

Abstract

The Indian Central Government has established One Nation One Tax as a new indirect tax to replace the service tax, excise tax, and VAT, among other taxes. The Vajpayee government proposed the GST in India in 2000, and after extensive discussion with various parties, the Rajyasabha approved it on August 4, 2016. India finally adopted the GST on July 1, 2017.

The consumption-based tax known as the Goods and services tax is currently applied on the supply of goods and services. It is a comprehensive tax because it includes nearly all indirect taxes, with the exception of a few state taxes. In India, there were previously two main sorts of taxes that were imposed by the government in various ways. The lengthy and complicated old Indian tax system requires a lot of paperwork from the average person in order to file taxes. The major goal of the GST, which went into effect on July 1, was to avoid the cascading impact of taxes or double taxation.

Following independence, India will alter its tax system, which will have a significant and immediate effect on the economy in the future. A revolutionary move like GST had actually become required for the sake of an accelerated economy, despite the fact that it also comes with a few negotiable short-term bad difficulties.

GST combines several indirect taxes and permits tax credits for both goods and services. It is assessed at every stage, from production through final use, with set-off for taxes already paid at earlier stages. In other words, only "value addition" will be taxed, and the final customer is responsible for paying it. But, with the set-off benefits that are allowed at all the preceding levels, the ultimate customer will only be responsible for paying the tax assessed by the last dealer in the supply chain. This indirect tax will unify the general market in India. It hopes that this new tax will benefit everyone in the nation, not just the average person. This article highlights the GST regime and Pros and Cons of GST

Keywords: GST, Cascading, CGST, SGST, IGST, Boon

Introduction

In India, Indirect taxes are levied by Central Govt like Central Sales Taxes, Service Tax, Special additional custom duty, Countervailing Duty and Central Excise Duty. On the other hand Indirect taxes are levied by State Govt like Luxury tax, State VAT, Purchase tax, Taxes on Advertisement, Octroi duty, Entry tax, Tax on lottery and gambling and betting. All the indirect taxes are merge into the GST

In India, GST is assessed at each stage of the production and sale of products and services. When the products or services are used, this tax is applied. The GST has three subcategories:

1. CGST: The Central Government collects Central Goods and Services Tax on interstate sales of goods and services.
2. SGST: The State Government collects State Goods and Services Tax from local businesses.
3. IGST: When goods and services are supplied from one state to another, the Integrated Goods and Services Tax is collected. The Central and State Governments each receive a portion of the taxes collected.

GST Rates

The GST Rate Slabs are decided by the GST Council. The rate slabs for goods and services are regularly reviewed by the GST Council. Typically, GST rates are high for luxury goods and low for essentials. The current default GST rates for all normal taxpayers are 0% (nil-rated), 5%, 12%, 18%, and 28%. There are a couple of less popular GST rates, such 3% and 0.25%. The most recent rate adjustment took effect. There have previously been numerous GST Council Meetings when specific rate changes have been introduced.

A. Increased GST Rates

Table-1

Category	Old GST Rates	New GST Rates
Railways Goods and Parts under Chapter 86	12%	18%
Pens	12%	18%

Metal Concentrates and Ores	5%	18%
Certain Renewable Energy Devices	5%	12%
Recorded media reproduction and print	12%	18%
Broadcasting, sound recordings, and licensing	12%	18%
Printed material	12%	18%
Packing containers and boxes	12%	18%
Scrap and polyurethanes	5%	18%
Railways Goods and Parts under Chapter 86	12%	18%

B. Decreased in the GST Rates

Category	Old GST Rates	New GST Rate
If vehicles are equipped with retrofitting kits for disabled people,	Applicability	5%
Keytruda for cancer	12%	5%
IGST is levied on goods sold at the Indo-Bangladesh border	Applicability	NIL

Objective of The Study

The main objective of this study is

1. To identify the pros and cons of GST
2. To Know the GST is BOON or BANE for Indian Economy

GST Calculation

The Indian government is boosting the economy by abolishing the cascading system of taxes and restructuring Indian business practises by enacting GST on products and services. Goods and Services Tax imposed by the Indian government on producers, merchants, and purchasers of consumer goods and services. It is founded on the Value Added Tax theory (VAT). A consumer is only required to pay the GST collected by the last dealer or supplier in the supply chain because it is assessed on value added at each stage. To determine the cost of GST that is applicable, utilise one of the many third-party websites' online GST calculators.

Formula for GST calculation

Add GST: $\text{GST Amount} = (\text{Original Cost} \times \text{GST}\%) / 100$
 $\text{Net Price} = \text{Original Cost} + \text{GST Amount}$

Remove GST: $\text{GST Amount} = \text{Original Cost} - [\text{Original Cost} \times \{100 / (100 + \text{GST}\%)\}]$
 $\text{Net Price} = \text{Original Cost} - \text{GST Amount}$

To calculate GST (Goods and Services Tax), you need to follow these steps:

Step 1: Determine the GST rate applicable for the goods or services you are selling or purchasing.

Step 2: Determine the transaction value of the goods or services on which GST is to be calculated.

Step 3: Calculate the GST amount by multiplying the transaction value with the applicable GST rate.

Step 4: Determine the gross amount payable by adding the GST amount to the transaction value.

"Tax on Tax" best captures the cascading tax effect. To further grasp what tax on tax is, let's look at this example:

GST regime before (Old Regime)

B consultant charging, let's say, Rs 100,000 for services would

add Rs 7,500 in service tax (15% of Rs 50,000 is Rs 15,000). = 15,000

Say She spent Rs 40,000 on office supplies and paid

Rs 2,000 in VAT (Rs 40,000 * 5%). = 2,000

She had to pay Rs. 15,000 in output service tax without receiving

a credit for the Rs. 2,000 in stationery-related VAT that he had already paid. She has spent a total = 17,000

Under GST

GST on services of Rs. 1,00,000 at 18% = 18,000
Less: GST on office supplies (Rs. 40,000*5%) = 2,000
Net GST to pay = 16,000

Pros of GST

These are the Pros of implementation of GST in India

- a) People can live simpler lives for less money
- b) GST will harmonise state-by-state indirect tax regulations.
- c) The GST regime would bring clarity to the system of indirect taxes
- d) GST would do away with the cascading effect of taxes in the production and distribution supply chain, enhancing competition and lowering prices in the process.
- e) A decrease in pricing will help to lower the inflation rate.
- f) GST would enhance income due to increased compliance and a larger base.
- g) Tax on products and services exported will be reimbursed. Due to the fragmented form of indirect taxes between the centre and states under the previous administration, it was not feasible.
- h) increase in the "made in India" project
- i) improved and most effective investment planning

Corns of GST

These are the Corns of implementation of GST in India

- a) The entire ecosystem would need to adapt and learn when the new GST system is adopted and migrated.
- b) According to some economists, GST in India might have a detrimental effect on the real estate sector. It would decrease demand by roughly 12% and raise costs of new homes by up to 8%.
- c) Some experts claim that the terms "CGST" (Central GST), "SGST" (State GST), and "CST" (Value Added Tax) are simply new titles for the same taxes. As a result, there is no significant decrease in the number of tax layers.
- d) This would have an impact on the aviation sector. Nowadays, service fees on airfares range from six to nine percent. This rate will exceed 15% with GST, nearly doubling the tax rate.

Boon of GST to Indian Economy

GST decreased the cascade of repetitive taxes on specific goods and led to an overall decrease in the prices of goods for the general public.

Comparing the VAT to other pre-existing taxes and the GST tax system as a whole, there is more support for states being able to earn their share of revenue in a more equitable manner as opposed to a monopoly by the federal government. The GST method of taxation is intellectually and resourcefully slightly taxing for enterprises, especially at first. Yet, taking into account online tax portals, fewer steps in submitting taxes, and fewer conversions overall is very advantageous to them in the long run.

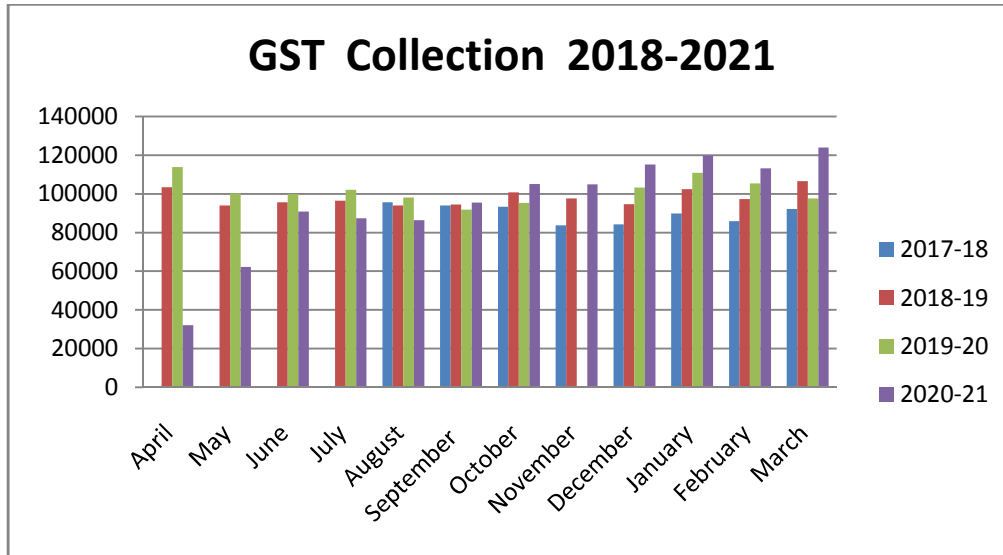
VAT system prevented an equitable distribution of taxes between the centre and the states. Also, it lacked a workable technique for validating input tax credits. Several of these problems are addressed by the GST system, which also systematically corrects significant flaws in our prior tax structure.

The VAT system enabled for taxes to be levied primarily on items, while services were neglected. There was also worry over software products and patents that were difficult to categorise and so slipped through the gaps.

Table-2 GST Collections-2018 to 2021

Month	FY 2017-18	FY 2018-19	FY 2019-20	(Rs. In Crores)
				FY 2020-21
April	-	1,03,459	1,13,865	32,172
May	-	94,016	1,00,289	62,151
June	-	95,610	99,939	90,917
July	-	96,483	1,02,083	87,422
August	95,633	93,960	98,202	86,449
September	94,064	94,442	91,916	95,480
October	93,333	1,00,710	95,379	1,05,155
November	83,780	97,637	1,03,491	1,04,963
December	84,314	94,726	1,03,184	1,15,174
January	89,825	1,02,503	1,10,818	1,19,875
February	85,962	97,247	1,05,361	1,13,143
March	92,167	1,06,577	97,590	1,23,902
Grant Total	7,19,078	11,77,370	12,22,117	11,36,803

Source: GST Council



Source: GST Council

From the year 2018 to 2021 GST Collections are increased from 7 Lakhs 19 thousand crores to 11 Lakh 36 thousands crores. It indicates that the income of country increases. So the GST is boon for Indian economy

Table - 3

Contribution to GST Revenue from Various Business Types		
Sl.No	Business type	Percentage of GST Collection
1	Public Ltd. Company	34.83%
2	Private Ltd. Company	27.94%
3	Proprietorship	13.28%
4	Public Sector Undertaking	9.64%
5	Partnership	7.29%
6	Society/ Club/ Trust/ AOP	1.38%
7	Limited Liability Partnership	1.18%
8	Government Department	0.99%

9	Statutory Body	0.38%
10	Foreign Company	0.38%
11	Hindu Undivided Family	0.25%
12	Local Authority	0.21%
13	Unlimited Company	0.01%
14	Foreign Limited Liability Partnership	0.00%
15	Any other body notified by committee	0.00%
16	Others	2.24%
	Total	100%

Source: GST Council

Conclusion

The GST has undergone several policy, tax rate, procedural, and technological modifications over the past five years, fundamentally altering the indirect tax structure in India. To keep up with the changes, all the ecosystem's players including the government, taxpayers, and tax experts have changed. Sadly, the pandemic had already interrupted economic activity by the time the Indian industrial industry could fully benefit from a single market. It revealed the weakness of the global supply chain system, not just that in India.

References

1. VasanthaGopal. R, GST in India, A Big Leap in the Indirect Taxation System, International Journal of Trade, Economics and Finance, Vol. 2, No. 2, P.144-146.. (2011)
2. <http://www.gstindia.com/about/>
3. <http://www.livemint.com/r/LiveMint/Period1/oldpdf/741e329f-def4-4ce9-a8c3-236721417717.pdf>
4. <https://www.quora.com/Whats-the-importance-of-GST-bill-in-India>
5. <https://www.quora.com/Is-there-any-loophole-in-GST-goods-and-service-tax>
6. V.S. Datey , GST Ready Reckoner, Taxmann , 4th Edition 2017
7. Abhishek A Rastogi,, Professional"s Guide to GST - From Ideation to Reality, Lexis Nexis
8. Nitya Tax Associates ,Basics of GST, Taxmann , 1st Edition August 2016
9. GirishGarg, Basic Concepts and Features of Good and Service Tax In India, International Journal of scientific research and management (IJSRM) Volume 2 Issue 2 Pages 542-54 2014
10. <Http://goodsandservicetax.com/gst/showthread.php?69-CHAPTER-X-Goods-and-Services-Tax-The-way-forward>

CHAPTER 41

CHALLENGES IN ENHANCING COMMUNICATION SKILLS OF ENGINEERING GRADUATES: A DIAGNOSTIC STUDY

Dr. Y. ANEEL

Associate Professor, Dept. of Humanities and Sciences
Sri Venkateswara College of Engineering & Technology (A)
R.V.S. Nagar, Tirupati Road, Chittoor
Andhra Pradesh, India

Abstract

In the age of science and technology, communication skills play pivotal role in the life of an engineer graduate. It is not only essential for them to get a job, but also helpful to excel in their jobs. According aspiring minds (2016) survey reveals that 67% of Indian engineering students are poor in communication skills and 97% of students are not fluent in English speaking skills. Many surveys state that engineering students do not have communication skills. It is important for engineering students graduating from colleges to be equipped with communication skills that will help them in world of work. Employers are seeking to recruit students who are not only well at academic knowledge but also communication skills. Teaching communication skills for engineering students helps and prepares them to face the challenges of professional world.

The basic aim of present paper is to analyze the barriers and difficulties faced by the engineering graduates while developing their communication skills. The researcher randomly collected 56 questionnaires from 1B.Tech students who are studying in Sri Venkateswara College of Engineering & Technology (A). Qualitative techniques were used to analyze data and the present the results in the form of bar charts.

Keywords: *Importance of communication skills, methodology, analysis, findings and recommendations.*

Introduction

Engineering graduates of the 21st century should be technically competent, globally sophisticated, culturally conscious, sharply creative and entrepreneurial, quick and flexible (Continental, 2006). Communication skills have emerged as a tool with enough power to make or break our career. According aspiring minds (2016) survey reveals that 67% of Indian engineering students are poor in communication skills and communication skills and 97% of students are not fluent in English speaking skills. A New Delhi-based employment solutions company, Aspiring Minds, conducted an employability-focused study (2014) based on 150,000 engineering students who graduated in 2013.

Apart from, Many surveys points outs that engineering do not have job centric skills. It is important for technical students graduating from colleges to be equipped with a variety of skills that will help them in world of work. Employers are seeking to recruit students who have not only well at academic knowledge but also communication skills. Teaching communication skills for engineering students helps and prepares them to face the challenges of professional world.

Objectives of the Research

1. To study the awareness about communication skills & their importance among engineering students of Sri Venkateswara College of Engineering & Technology.
2. To analyze the barriers and difficulties faced by the engineering graduates in enhancing communication skills
3. To understand students' opinion about the material used and methodology adopted in the classroom.
4. To recommend suitable solutions for the improvement of communication skills.

Review of Literature

Jaya Mishra [2] explores that Most of the colleges and universities fail to provide an appropriate environment conducive for developing oral communication skills. At college level, teachers confined to a particular prescribed syllabus which covers the semester exams. It is also known fact that despite having communication skills lab in almost every technical college today, students still lack good speaking skills.

Kaushal Urvashi [3] discusses that there is the apparent gap between academic programs and industry skills requirements. She also stresses the role of academia in filling this gap by acting as facilitators in a three-step process such as awareness, self-analysis, and acquisition.

Research Methodology

The study was descriptive in nature. After going through the relevant literature, a standard questionnaire was prepared and approached many subject experts to confirm the validity of it. Samples were collected from I B.Tech students through a questionnaire from Sri Venkateswara College of Engineering & Technology.

The questionnaire had the following sections:

- I. Demographic information of the students like social background and gender.
- II. Understanding the barriers and difficulties faced by the engineering graduates in enhancing communication skills
- III. Understanding teaching methods and approaches on teaching communication skills.

The collected questionnaires were analyzed and data along with its analysis presented in the form of bar graphs. For clear understanding, every item of the questionnaire was presented separately in form of frequencies.

Data Analysis and Results

Qualitative techniques have been used to understand the relevance and suitability of communication skills curriculum. The word qualitative implies an emphasis on the qualities of entities and on processes and meanings that are not experimentally examined or measured.

1. To check the Awareness of the Students

The following questions were prepared to understand the learners’ perception and awareness on Communication skills they need for their career.

- 1. *Do you think you need to learn communication skills as a part of your B.Tech Course?*
- 2. *Do you know that without communication skills you will not be selected for any job?*

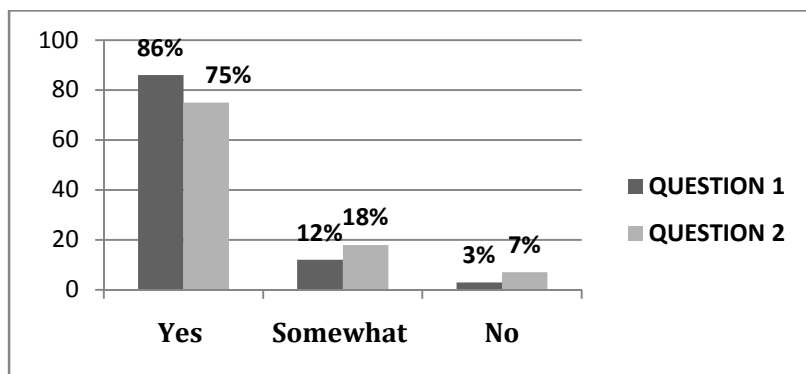


Figure 1

In reaction to the questions, a majority of the students expressed the need to gain proficiency in communication skills. The figure 1 states that 86% of respondents recognized the importance of communication skills and believed that it should be part and parcel in engineering curriculum. 75 percent of the students agreed that they will not get any job without communication skills.

2. On the Learning Environment

The learning environment should be learner centric to improve their needed skills. The following question were designed to know whether students are getting opportunity to share their views or not.

- 1. *Does your English class allow you to share your views?*
- 2. *Do you get an opportunity to give seminar in front of your classmates?*
- 3. *Is your communication skills class interesting?*

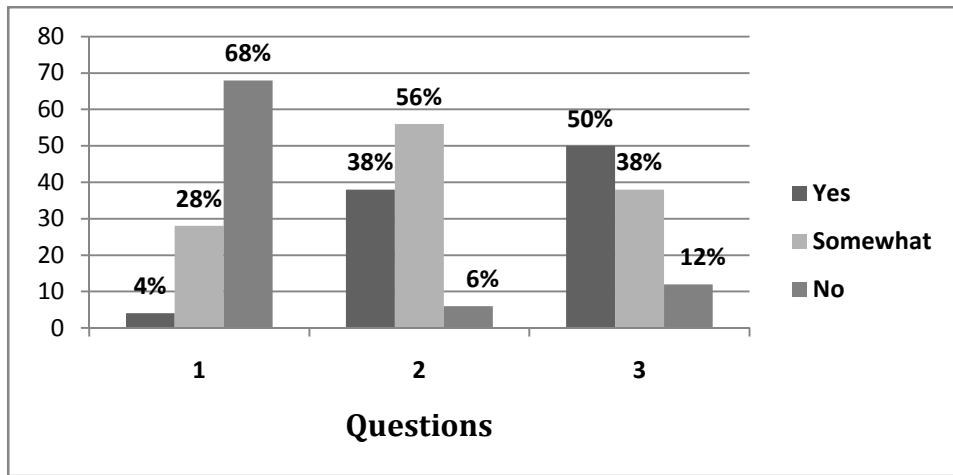


Figure 2

The above diagram clearly states that 68 percent of the respondents feel that they are not allowed to share their views, but surprisingly 56 % of respondents were encouraged reasonably to give seminars and presentations in front of their classmates. 50% students feel that their communication skills are interesting Even though they get less time to share their opinions.

3. On curriculum

1. *Did the syllabus and materials of communication skills satisfy your needs?*
2. *Do you have Interactive sessions with industrial/corporate experts at regular intervals.*
3. *Do you have an opportunity to participate in different team activities like group discussions/job Interview and formal activities in the class?*
4. *Does the syllabus contain more exercises to improve communication skills?*

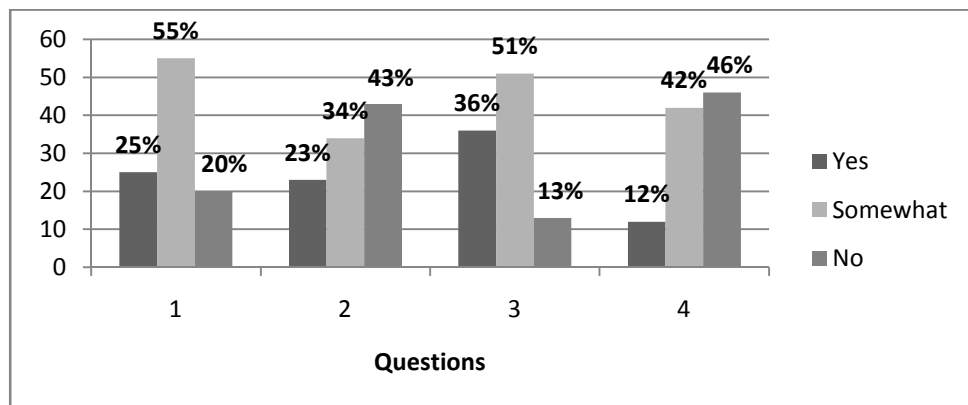


Figure 3

The aim of the 1st question is to analyze the syllabus and materials prescribed for them. 55% of the respondents feel that the syllabus is good some extent in satisfying their professional needs and only 25 % respondents among 56 agreed that the communication skill contents are suitable to improve job prerequisite skills.

4. On Methodology

There are many methods to impart communication skills among students but appropriate method promotes enhancement in short span of time. The researcher prepared the following question to know methods which are used by teachers. Respondents were given four options namely lecture method, discussion, task based method and any other.

1. What kind of method is mostly adopted by your communication skills teacher in the classroom?

1. Lecture method 2. Discussion 3. Activities based 4. Any other.....

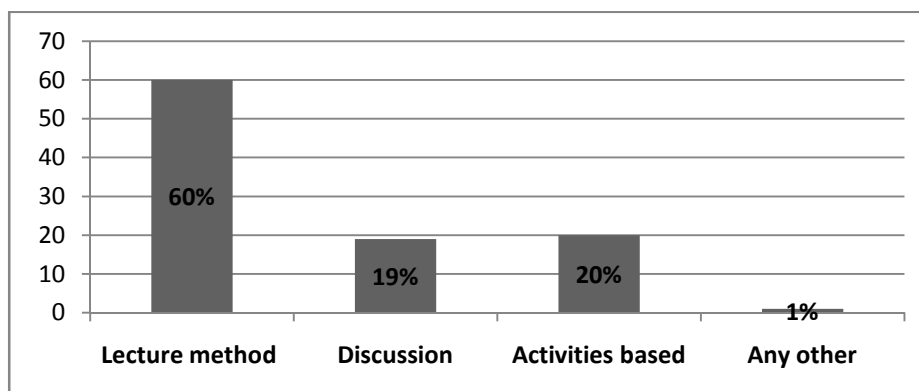


Figure 4

The data in the figure 4 reveals that 60% of respondents accepted that their teachers are teaching lessons by using lecture method which plays less role in developing communication skills and only 20% respondents shared that their class are task based and activity based.

5. On the barriers and difficulties faced by the engineering graduates

In the questionnaire, Students were asked to mention any five problems that they were facing while communicating with others. The students have shared the following barriers and difficulties.

- If someone was asking question in English, the students could not reply suddenly and taking much time.
- Difficult to communicate with others in English and not easy to understand grammar topics
- Students comprehension skills are very less
- Students afraid to make correct sentences
- Shy to with friends in English and stage fear
- Students were discouraged by their friends
- Lack of knowledge to pronounce some difficult words properly.
- Fear of making mistakes, poor vocabulary
- feeling difficulty in face to face speaking in English
- Difficult to spot the errors
- Can't express the known word easily

The summary of findings from data analysis

The analysis of the data obtained from the questionnaire gives the following results

- The learners have positive attitude towards developing communication skills. They understand that command over communication skills is important for getting jobs in multinational companies
- The students like activities based teaching
- The students feel that adequate practice is not being given in communication skills. They feel that they do not get enough opportunities to practice in the classroom.
- They need extensive practice in the classroom and this must be done and evaluated.
- Most of students shared that their teachers are using lecture rather than task based activities
- Students expressed that they have inadequate interactions with industrial experts.

Suggestions

1. While designing communication skills course, care must be taken to include activity based methodology.
2. Teachers must ensure students work in teams, give opportunity to make regular presentations to help them develop their confidence and communication skills.

3. The teachers should properly plan and prepare right from the beginning how he or she should utilize the time so that enough time is given to other activities like role plays extempore speeches, team activities like group discussions, oral presentations and other short activities in the classroom regularly.
4. Students should know their strengths and weakness to overcome the barriers and to improve communication skills.
5. Students should not hesitate to speak in English with their friends and get honest feedback from them to rectify mistakes
6. Students should spend at least 30 minutes per day to listen the speeches of native speakers. This helps them to improve their accent and pronunciation.
7. Acquiring Communication skills takes much time and it has to be 'acquired' over a period of time. Therefore it should be implemented at least two to three semesters.

Conclusion

Communication skills play leading role in the present era. Outdated curriculum and lack of industrial exposure are some of the major reasons why engineering students poor in communication skills. So professional colleges and universities are advised to update the curriculum and incorporate communication skills teaching and training in the course and prepare the students to turn out to be employable. Apart from this, Students also should pay special attention to inculcate and improve communication skills.

References

1. Sambaiah.M, *Technical English*, Willy India pvt.ltd, New Delhi, 2014.
2. Jaya Mishra, "Effective Ways to Teach Oral Communication Skills to Engineering Students of Chhattishgarh", *Journal of Research in Humanities and Social Science* Vol.3, No.3, 2015, pp. 47-51.
3. Kaushal.U, "Empowering Engineering Students through Employability Skills", *Higher Learning Research Communications*, Vol.6, No.4, 2016, pp.1-10.
4. http://usemyability.com/resources/skills_abilities/flexibility-and-adaptability.html
5. http://www.advice-manufacturing.com/Leading-Engineering-Teams.html#engineering_teams
6. <http://www.hindustantimes.com/education/97-engineering-graduates-cannot-speak-english-fluently-survey/story-GQEkTYwI4AX5zc7oeXkz1M.html>

CHAPTER 42

DIFFICULTIES ENCOUNTERED BY ENGINEERING STUDENTS LEARNING ESL IN ENGINEERING COLLEGES IN ANDHRA PRADESH

Dr. R. DEVARAJULU REDDY

*Professor of English, Department of Humanities and Sciences
Sri Venkateswara College of Engineering & Technology
RVS Nagar, Chittoor, A.P*

Abstract

The main objective of this study is to identify the difficulties encountered by engineering students learning ESL in Engineering Colleges in Andhra Pradesh and to propose subsequent recommendations. The first initiative was to provide the questionnaire 'on the difficulties encountered in learning English' to 22 students from I B. Tech Electronics and Communication Engineering discipline at Sri Venkateswara College of Engineering and Technology, Chittoor, A.P. and to obtain their responses. The findings infer that comprehending English has been the biggest problem area followed by grammar and vocabulary. Results also imply that the great majority of students do not study or practice English on a daily basis. This study concludes with recommendations for 'English language' courses focusing on basic grammar and vocabulary practice on regular basis in the presence of a mentor. The question of student motivation is considered as vital in this discussion.

Keywords: *Difficulties, ESL, Encounter, mentor, motivation.*

Introduction

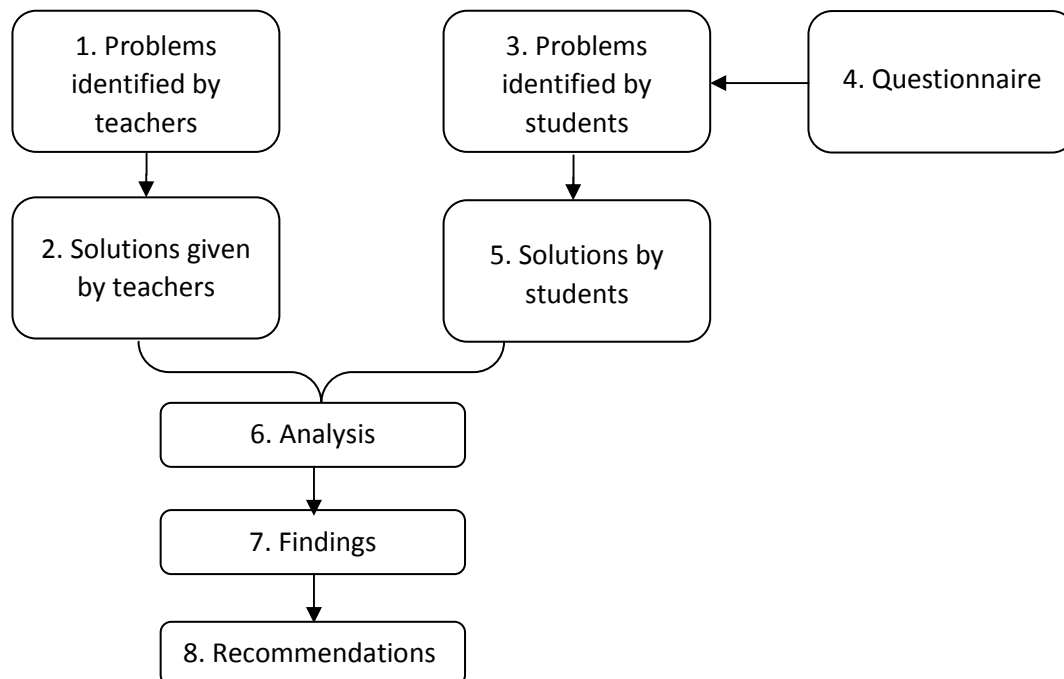
Language is a very important means of communication. It is very difficult to think of a society without language. It sharpens people's thoughts and guides and controls their entire activity. It is a carrier of civilization and culture (Bolinger, 1968). In the case of the mother tongue, the child learns it easily, due to the favorable environment and by the great amount of exposure to the language. But, learning a second language requires conscious efforts to learn it and the exposure to the second language in most cases is limited (Bose, 2007). Despite the great effort extended in developing general competency in English among India students over recent years, the results have been mixed. In a developing country like India, a constant touch with the outside world is absolutely solicited to bring about the revolutionary changes in every field. The successful acquisition of a second language seems to some extent, contingent upon learners' views of the language learning environment, the learning situation, and how they view the target language and its speakers (Narayanan et al., 2008). Without adequate knowledge of English language, we cannot come to grip with modern technology. In India, English is the only language which is understood in all states. But unfortunately, the majority of Indians still feel uneasiness in using English in terms of writing or speaking. The teaching learning in our schools and colleges is so much defective that only a complete over haul will set it right. There are so many factors affect the process of learning a second language, including attitude, self-confidence, motivation, duration of exposure to the language, classroom conditions, environment, family background, and availability of competent teachers (Verghese, 2009).

Literary Survey

Improving comprehension skills involves developing students' ability to understand and interpret written or spoken language effectively. At the same time the students must be good at grammar and vocabulary. But the sad part is that most of them are weak at all the three aspects i.e. comprehension, grammar and vocabulary. Hence, it is time to find new methods which will be helpful to overcome the students learning lapses. With basic knowledge in English with the help of some mobile phone one can develop language skills perfectly. Several mobile such as English Pro, English Listening Skill Practice etc. are the most sought after ones to develop language skills. Other important thing is that students have to arrange English speaking environment. Make English part of your life at home, at work, during your free time. Read on to find tips that will help you overcome the difficulties you might be experiencing to improve your English language (Sagar. B, 2013).

Research Design

To know difficulties encountered by students in English language classroom and solutions they find and to correlate the same with my observation, a questionnaire has been prepared and shared with the students for their response. The following is the procedure of obtaining response from students and correlating it with my observation.



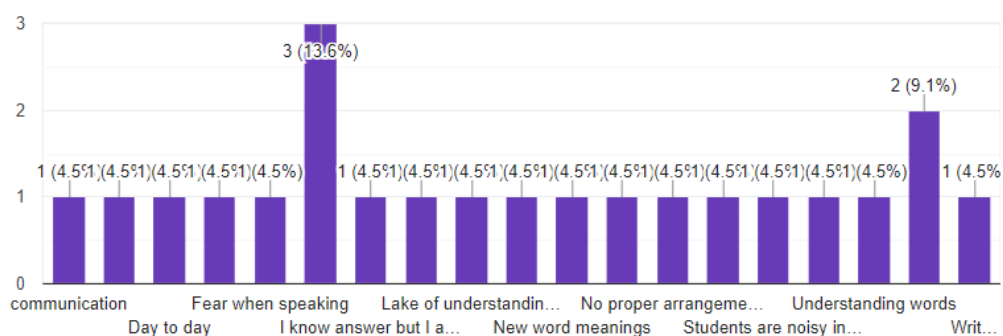
Data Analysis

The researcher, as a teacher identified 15 difficulties encountered by engineering students learning ESL in Sri Venkateswara College of Engineering & Technology (SVCET (A)), Chittoor in Andhra Pradesh and also found possible solutions for the same. The researcher framed questionnaires as a tool for data collection, such as the student's place of birth, status of the place of birth (city/town/village), his/her age, medium of study till the previous course of study, 5 difficulties faced by them in learning English as Second Language (ESL) and 5 possible solutions for the same problems. The collected data of students' opinions supported to processed to do further analysis. 22 students were randomly selected who came from different areas to study engineering graduation in SVCET (A), Chittoor, A.P. to do research experimentation. The opinion of the students gathered in statistical method and to analyze, the data researcher used tables. The percentage of the respondents used to accumulates the results. The following is sample difficulties faced by the students and solutions they found.

Difficulty 1 faced by you

[Copy](#)

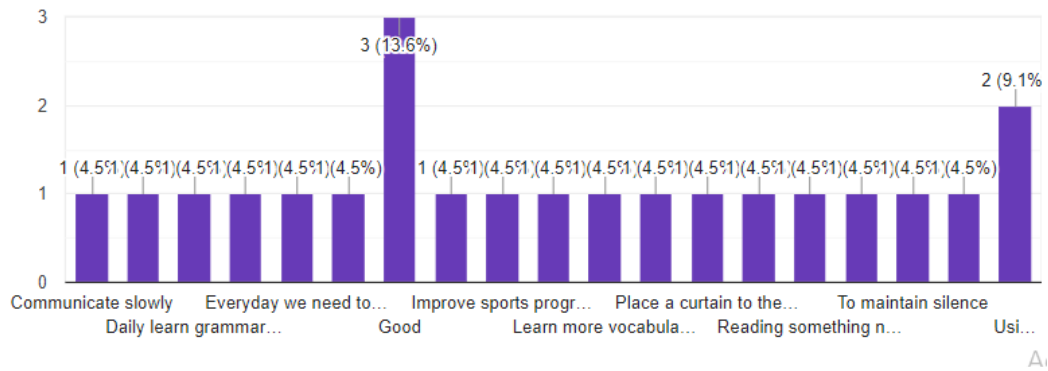
22 responses



Expected solution for the difficulty 1

[Copy](#)

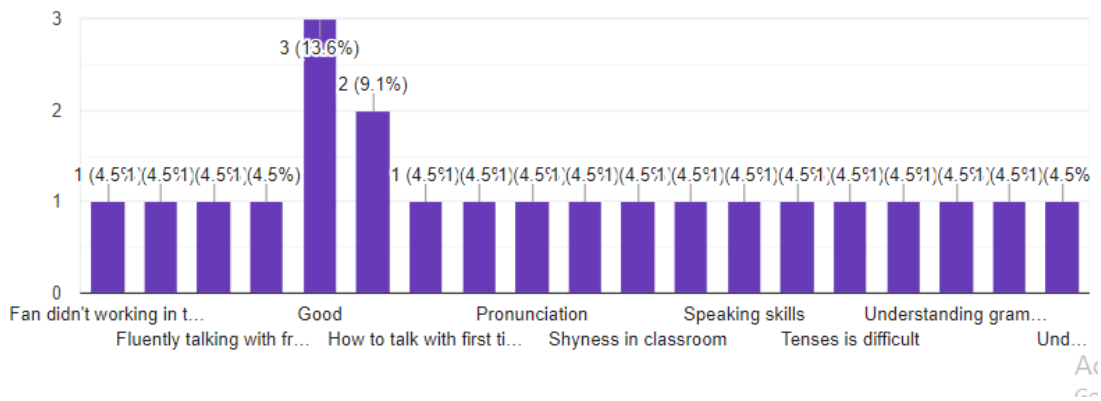
22 responses



Difficulty 2 faced by you

[Copy](#)

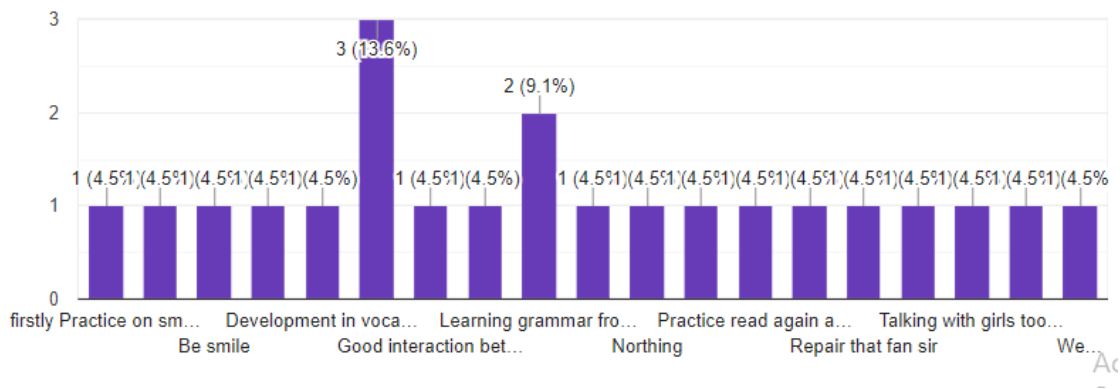
22 responses



Expected solution for the difficulty 2

[Copy](#)

22 responses



Problem Identification

S. No	Teachers	Students
1.	Comprehensive skills of students are very low so the teacher has to explain concepts by taking a lot of time.	Comprehensive skills are very low.
2.	Students are very poor at language rules (grammar) and hence they fell difficult of understanding the teachers' lessons properly.	Poor grammar and communication skills
3.	Majority of the students have more nervousness.	Nervousness and lack of confidence.

4.	Students have low level of motivation	Encouragement is needed.
5.	Many students can't read and understand a text properly.	Reading and understanding is difficulty.
6.	Teaching learning practices existed in the institute may affect the volume of learning.	More courses are needed on English.
7.	Students are noisy because of too much proximity in the classrooms.	Students are noisy in the classrooms.
8.	Most of the classrooms are not conducive for teaching because of improper air circulation, echo in the classes and ventilation problems.	Board is not visible to all the students.
9.	Intervention of others to classrooms in the name of collecting absentees, taking geo tag photos etc.	Many disturbances during class work.
10.	Size of the classroom affects the process of teaching and learning.	Some teachers' voice is not audible.
11.	Socio economic conditions of the students impact the learning process.	No proper access to English speaking environment.
12.	Psychological conditions of the students many affect the process of the learning.	Surrounded by the people who are not talking in English.
13.	Students with Attention Deficiency Disorder (ADD) are very tough to handle.	No concentration.
14.	Mood of the students (eg: a day before a holiday or vacation) impacts learning.	Sitting in the classroom continuously is difficult.
15.	Lack of personal monitoring/observation, evaluation and follow up leads to defective learning.	Writing practice should be more.

Probable Solutions

Sl. No	Teachers	Students
1.	Reading and listening comprehension exercises have to be provided with the students for improving comprehensive skills.	Reading comprehension exercises have to be provided. Reading something new and remember the words.
2.	Rules of the language (grammar) have to be made integral parts of teaching the language. it means grammar rules are not taught in isolation but make the students understand them while teaching language.	Learn and improve grammar.
3.	In order to draw attention of the students, teachers have to make classes more interactive.	Conducting programs regularly.
4.	Motivating students and bringing them to the level of other students in the class is a major important practice of a teacher. Let's discuss successful stories of personalities in different fields, and share our own experiences to motivate them.	Motivate students in any situation.
5.	Assignments on reading have to be given to the students. Direct them to use some mobile Apps and websites (online learning) for improving reading skills. Strategies of reading skills will be explained clearly.	By watching English videos daily.
6.	Academic respite is absolutely needed to a teacher for improvement of teaching learning systems.	More practice is needed

7.	Students have to be busily engaged in the classes.	Community with friends. We have to be silent.
8.	Proper ventilation and echo free should be ensured in the classes. Switch off fans during teaching if necessary.	Noisy fans are replaced.
9.	Administrative staff members have to device other ways to collect attendance and take photos or at least minimize these activities.	Keep learning.
10.	If the class is too big to control, let's divide the class into two sections.	Make strict rules.
11.	Understand the students those who come from weak socio-economic conditions and be empathetic with them.	Listening variety of slangs.
12.	Students who are psychologically/mentally weak have to be counseled properly and taken care well.	Ask simple and easy questions.
13.	Identify the students with Attention Deficiency Disorder (ADD) and give frequent feedback and attention to their positive behavior. Allow them to have breaks or time to move around. Limit distractions. Reward good behavior.	Supply necessary tools in the class.
14.	Let's understand the mood of the students and give inputs to them. When students are hungry during last periods, plan interactive based teaching. Let them diver from the mood of hunger to involve in learning.	Give us small intervals.
15.	Teachers are overloaded with multiple activities. Teachers are given defined works so that other free time will be spared for monitoring and observing the students.	Writing paragraphs and essays by using own ideas and sentences.

Other Probable Solutions

Sl. No	Other Solution
1.	Learn a word a day. Focus on word meaning, usage etc. to improve vocabulary.
2.	Read more.
3.	Start with small sentences and continue it.
4.	Frequent interaction with others.
5.	Smile before talk.
6.	Learning tenses and doing exercises regularly.
7.	Practice writing skills.
8.	Speaking clearly and watching videos of native speakers.
9.	Need to analyze the structure of sentences.
10.	Provide opportunities to use English language.

Conclusion

Based on the research study and analysis, there have been some problems faced by the students in learning English as Second Language and possible solutions identified. The teachers and students mentioned almost 50% of the problems similar such as less comprehension skills, grammatical mistakes, poor vocabulary, stage fright, low confidence, previous educational background, fear of talking in English in front of others and no English speaking environment. Even with the possible solutions the opinion of teachers and students is almost 50% similar such as providing

comprehension exercises, practice worksheets on grammar conduct fun based activities, motivate the student by persuading with the reasons of learning English Language, and peer group activities.

Recommendations

The following are some tips to help improve comprehension skills, grammar and vocabulary:

Read regularly: Reading is an excellent way to improve comprehension skills. Read a variety of materials, such as books, newspapers, magazines, and online articles.

Focus on the main idea: When reading, focus on the main idea of the text. Try to identify the key points and how they relate to each other.

Improve Vocabulary: Developing a strong vocabulary can help them understand the meaning of words and phrases, making it easier to comprehend the text.

Focus on Grammar Aspects: Rules of a language should not be learnt in isolation. It should be an integral part of learning language. Pay attention to grammar aspects while reading a text or listening.

Procure Ample Resources: The study also suggests to the teachers to encourage the students to utilize mobile phones as major tools of learning. Several mobile Apps such as Spreaker, Vimeo, Google Translator, Live Transcribe, etc have been found very useful in learning English. In addition, web sources developed by British Counsel, Oxford, Cambridge etc. have been proved to be very useful in learning English.

References

1. Bolinger, Dwight. (1968). *Aspects of language*. New York: Harcourt, Brace & World Inc.
2. Bose, M.N.K. (2007). *A text book of English language and teaching (ELT) for Indian students* (2 ed.). Chennai: New Century Book House.
3. Verghese, Paul C. (2009). *Teaching English as a Second Language* (9 ed.). New Delhi Sterling Publishers.
4. Narayanan, R & et al. (2008). "Some factors affecting English learning at tertiary level". *Iranian Journal of Language Studies*, 2(4), 485 – 512.
5. Sagar, B. "Problems Faced By Indian Students in Learning English". *Research Journal of English Language and Literature (RJELAL)*, Vol.1.Issue 2. 2013.

CHAPTER 43

PROXIMATE ANALYSIS OF THE PROBLEMS AND FEASIBLE SOLUTIONS IDENTIFIED BY THE TEACHER AND LEARNERS IN THE TEACHING-LEARNING PROCESS

Ms. S. SWATHY

Assistant Professor of English, Department of Humanities and Sciences
Sri Venkateswara College of Engineering and Technology, Chittoor

Abstract

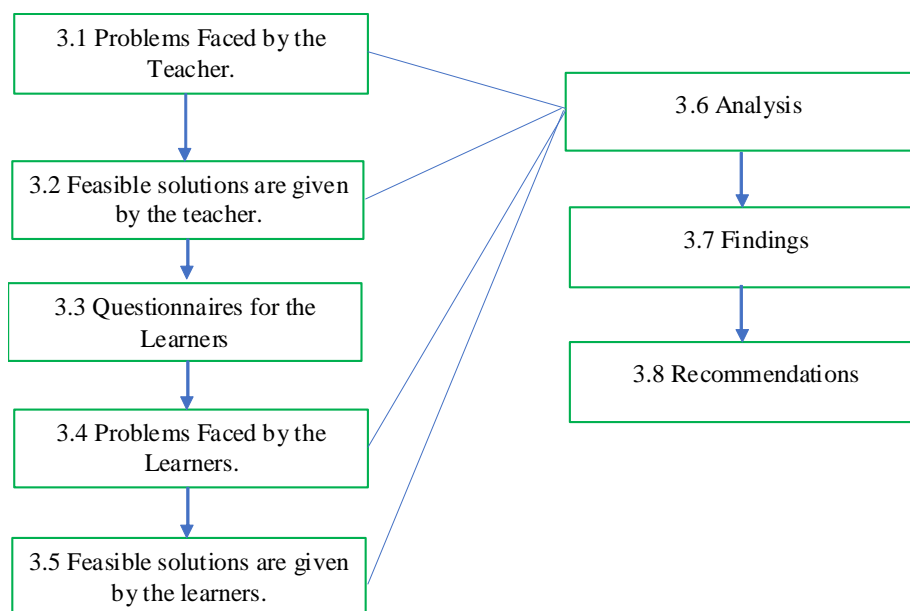
This research paper surveys the difficulties faced by the English language teacher and learners during the teaching-learning process. The researcher identifies the problems and feasible solutions in the teaching-learning process and employs closed and open-ended questionnaires for the learners. Both the problems and feasible solutions were analyzed. The findings may be generalized so that the institutions which provide different programs in B. Tech can provide appropriate assistance for the improvement of the LSRW skills of the students.

Keywords: Teaching-Learning process, difficulties, analysis, findings, Importance of LSRW skills.

Introduction

The teaching-learning process is slowly turning from teacher-centric to learner-centric these days. For a successful teaching-learning process equal importance should be given to both teachers and learners. There are a significant number of problems faced by a teacher as well as the learner like language barriers, cultural barriers, environmental problems, and other general problems during this process. The objective of this paper is to survey English Language teaching-learning problems related to the teachers and students and other factors. It also aims to analyze the hardships faced by them and to come up with feasible solutions which are congenial to both.

Research Design



Research Methodology

Problems Faced by Faculty in the Teaching-Learning Process

1) Cultural Barriers

As the students are from different states and countries, the teacher has difficulty finding real-life examples to match the concept while teaching.

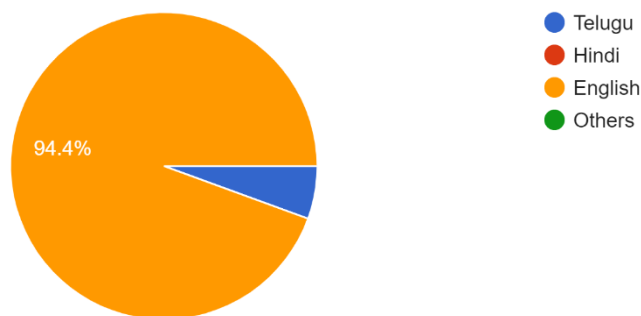


Figure1 Medium of Studies

2) Lack of English Exposure

Students have spent more than twelve years studying English in primary and secondary schools, but the results are questionable (Figure 1). The reason is a lack of English exposure outside the classroom.

3) Language Barriers

Faculty sense difficulty while explaining certain terminology as the students learn English as a second language. The learners always ask for a translation in their languages (Telugu, Hindi, Nepali, etc.) for such terminologies.

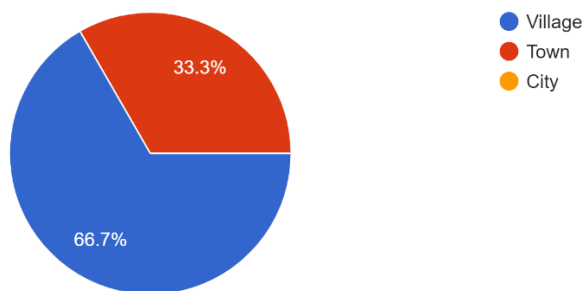


Figure 2 Type of native place

4) Rural Background

As can be seen from Figure 2 most of the learners are from a rural background, and they fail to ask doubts in English. They feel comfortable asking questions in their native language (Telugu, Hindi, etc.).

5) First Graduates

As most of the students are the first graduate of the family, they don't have students not having enough practice in English on their own.

6) Lack of confidence

English is their second language students lack the confidence to speak in English. Each student must speak in English in the classroom as most of the topics in their syllabus are based on LSRW skills.

Feasible solutions by faculty (Teaching learning problems)

1) Background Study

When a teacher starts teaching students from multiple cultures, along with the subject they should also do some background study about their culture. It will help them provide real-life examples.

2) Building Exposure

Continuous listening develops speaking skills widely. The learners can be encouraged in watching English cartoons or ted talk videos with subtitles so that they will get exposed to the language even outside the classroom.

3) Usage of Easy Words

Instead of using difficult terminology, the teacher should practice using easy English words so that the student may not ask for a translation.

4) Good Motivation

The teacher cannot motivate the students to learn English well enough to ask their questions in English.

5) Usage of ICT Tools

The teachers should be multi-faceted. They are required to make effective use of information and communications technology (ICT) in their teaching; to cater to a variety of learning styles (as elaborated in Gardner's Theory of Multiple Intelligences, 1993).

6) Counseling the Student

Students may slowly gain confidence through proper counselling by a teacher.

Questionnaires (Research Instrument)

After identifying the problems faced by the teacher in the English teaching-learning process a set of questions were prepared by the researcher and circulated among the students to receive their point of view on the problems they face in the same process. The questionnaire consisted of the following questions:

Name of the student	
Register number	
Name of the native place	
Type of native place	
Medium of studies	
Problems faced by a student in the classroom (1, 2, 3, 4 &5)	
Feasible Solution (1, 2, 3, 4 &5)	

Problems Faced by the Students in the Classroom

- 1) Language barriers (3)
- 2) communication with other state students will be the big problem
- 3) I have no practice in English speaking
- 4) Stage fear
- 5) I cannot understand some words in the class
- 6) No one speaks English in my home
- 7) I fear my friend laugh when I speak in English
- 8) When we try to speak in English the other person may tease us for the grammatical mistake.

Feasible solutions are given by the students

- 1) Take spoken English classes(2)
- 2) Give practice
- 3) Please conduct some seminars to develop English
- 4) By proper motivation (3)
- 5) Plan training sessions
- 6) In my point of view the teacher should encourage the student to converse in English.
- 7) If we make a mistake teacher should advise classmates not to mock us.

Analysis of problems faced by faculty and students in the classroom

Sl. No.	Faculty	Students
1	Language barriers	Language barriers (3) I cannot understand some words in the class
2	Cultural barriers	Communication with other state students will be the big problem
3	Lack of English exposure	I have no practice in English speaking
4	Rural background	-
5	First graduate	No one speaks English in my home
6	Lack of confidence	Stage fear/ When we try to speak in English the other person may tease us for the grammatical mistake.

Analysis of Feasible Solutions given by Faculty and Students

Sl. No.	Faculty	Students
1	Background study	-
2	Usage of easy words	Explain the subject understandable students clearly
3	Good motivation	By proper motivation (3) / In my point of view, the teacher should encourage the student to converse in English.
4	Counselling the student	If we make a mistake teacher should advise classmates not to mock
5	Building exposure	-
6	Good motivation	-
7	Usage of ICT tools	-

Research Findings

This quantitative survey study was conducted on a small scale. The sample was thirty-six learners of the English language from different programs of B.Tech. The finding shows that almost all the problems identified by the faculty match with the learners except one. No student has mentioned that their rural background is a problem in learning the English language. But as a researcher, I would say that it's also a major issue which they have not realized yet. Whereas the feasible solutions given by the faculty are different from the student's perception (Take spoken English classes, Give practice, Please conduct some seminars to develop English, Plan training sessions).

Conclusion

The research findings clearly show the students' angle of viewing the problem and coming up with the solution differs from the faculty's assumption. When comparing the study results, the perception of both teachers and learners was similar and different in many ways.

Recommendation

The current study compares the perspective of a single teacher and a few learners on English Language teaching-learning problems; it may be worthwhile to take different perspectives of the teachers working in different types of institutions like universities, arts & science colleges, etc., and learner views on English teaching and learning problems into consideration, too.

References

- 1) Noom-Ura, Sripathum. "English-Teaching Problems in Thailand and Thai Teachers' Professional Development Needs." *English Language Teaching* 6.11 (2013): 139-147.

CHAPTER 44

OBSTACLES FACED BY REGIONAL STUDENTS IN DEVELOPING LANGUAGE: AN EMPIRICAL STUDY

Ms. S. DEVAYANI

Assistant Professor, Dept of Humanities and Sciences
Sri Venkateshwara College of Engineering and Technology
RVS Nagar, Chittoor

Abstract

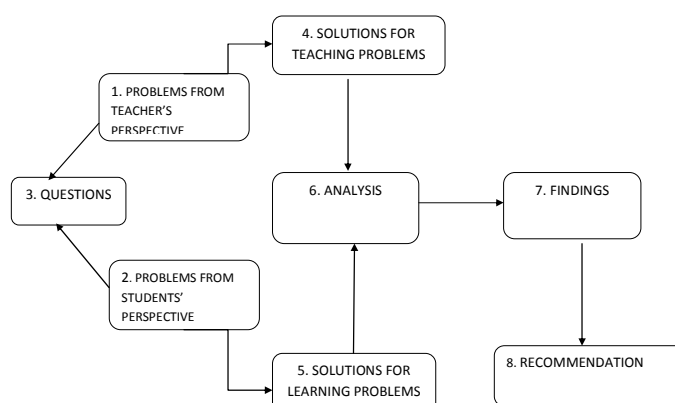
This paper expresses the problems and difficulties in teaching English to the Regional and Local Students that includes students from Bihar and Nepal, especially from underprivileged background. The paper also includes about the basic problems from both students and teachers perspective considering the syllabus given to the I B.Tech students, strength of the class, understanding the concept, other classroom disturbances. The comparison between regional students and Local students in the same class itself varies a lot when it comes to teaching and learning. The problem with teachers in controlling the students and taking care individually made an attempt to write this paper. 'English is just a language, not knowledge' is the basic understanding should be given to any students irrespective of their mother tongue. The paper aims at analyzing the obstacles faced by the regional students and the teacher teaching them English. Hence the study is involved with data collection from Sri Venkateshwara College of Engineering and Technology, RVS Nagar, Chittoor, through survey method.

Keywords: Regional students, underprivileged background

Introduction

Language is an important means of communication. It is difficult to survive without language for any person in this society. The purpose of learning English language is to survive anywhere if the student makes a move to any part of world. But learning English is considered to be a very big struggle for the students from Bihar and Nepal. Even the teachers who teach them are facing many obstacles in making them to understand the concept. Considering this, an attempt was made through empirical research on finding the problems of students in learning language and the solution given by the students themselves which is discussed in this paper. There are so many obstacles faced by the teacher in teaching regional students because they can never use their mother tongue influence. Is that easy for an Indian to talk all regional languages like Maithili, Nepali, Bhojpuri, etc? Seriously NO. But still a mathematics teacher can teach the regional students by explaining the problems with numbers; a programming teaching can show the program in the system and make the students to understand the concept. What can a language teacher do? Mostly with verbal and at times with non-verbal at least he or she can make the student to understand what they teach. Will this result in proper understanding for all students? Not really. Hence the difficulties from a language teacher's perspective and how to recommend solution, also difficulties from students' perspective and their recommended solution is given as an empirical research through survey method done with 27 students from Civil Engineering and 9 students from Mechanical Engineering in this paper.

Research Design



Data Analysis

Obstacles from teacher's and students' Perspective

S. No	Teachers	Students
01	Understanding the concept takes much time for Bihar and Nepal students.	Unable to understand English
02	Mostly regional students can't understand my language especially with pronunciation of even a very simple word.	Cannot pronounce English words properly. Cannot understand when spoken faster.
03	Some students can write their answers well in the exam, but when I ask them in person they never answer.	Fear to talk in front of others.
04	Regional students are mostly from poor background.	First graduate from poor background.
05	There is at least one student in each class who never pays attention to any faculty; it is because he knows not even one word in English, except 'YES'.	Don't know how to speak English fluently.
06	They expect me to write everything on the board as sentences.	Can't understand sentence told. Write on the board.
07	Students are aimless these days.	Not interested.
08	Major problem for some regional students is with spelling and grammar.	Difficult to understand Grammar.
09	Students ask for materials and we give them spoon feeding. Never made them to search for their own secondary sources.	Provide easy notes for Communicative English.
10	Few students from Bihar will be very good in Mathematics even it is taught in English but not so with Communicative English.	Finding difficult to learn English.
11	Students from regional areas expect the concept to be taught in their native language.	Explain in Hindi/Telugu.
12	Students do not know proper pronunciation, spellings and grammatical rules.	Don't know grammar. Grammar mistakes while speaking.
13	Regional students were taught grammar with Grammar-translation method.	Teach grammar in Hindi
14	Students cannot follow teachers speaking with good accent.	Cannot understand when spoken faster. Speak with me in English slowly.
15	Students are not realizing the importance of learning English as a language.	Not interested.

Solutions given Similarly

S. No	Teachers	Students
01	Teaching the concept from their understanding level is needed.	Regular practice of speaking helps improve fluency.
02	Making students to be aware of certain simple words with their spelling and pronunciation.	As we are in a professional course we have to improve vocabulary to make us professionally confident. A course can be implemented for improving vocabulary

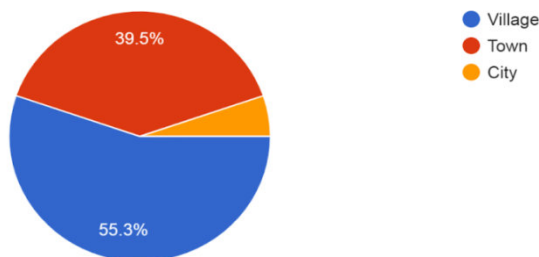
03	Making them to explain what was taught previously and giving simple seminar topics.	Train us for good communication.
04	The faculty should take individual care and should support the students for their personal growth.	Encouraging students and boosting confidence for not letting language to become a barrier for them.
05	When a Bihar student can learn Mathematics well, then obviously the student can learn English well. Language should be taught with some additional activity within the classroom.	Conducting extra activities where we can improve our knowledge.
06	Instead of writing assignments, students can go with simple research homework at home.	Provide textbooks in library. Giving assignments in understanding way. Give one period for library.
07	Create confidence of speaking English in Public.	Train me to talk with confidence.
08	Teaching them English alphabets before the age of five will make the students to be strong in Language.	As grammar is very vast in English ensuring regular classes for improving grammar.
09	Providing simple spelling tests and pronunciation activities will result positively.	Regular practice of speaking helps improve fluency.
10	If language is taught with some activities the students may feel it much easier to learn the language very quickly.	Activities on speaking skills. Oral presentation.
11	Having a poem, short stories and other literature stuff makes students to gain their interest towards learning.	Take some classes for to improve our English.
12	Try motivating the students to think through English.	Speaking in English daily in the classroom. To deal with embarrassment practice as much you can.
13	Making them to realize the importance of learning English as a language.	Encouragement from teachers.
14	Avoid Grammar Translation method to teach grammar.	Explain grammar well.
15	Training them with good accent through phonetics.	Making students adequately aware about phonetics and helping them develop a good accent.

Analysis

Regional Students expecting Mother Tongue Influence in Teaching

History has witnessed the growing importance of English language all over the world. English is used by people for more purposes than any other language on Earth. As an empirical study a Google form was sent to the students to fill the problems they face while learning English as their second language. Students from regional areas and rural background face a number of obstacles. English is their second language. As a result of the survey 15 problems and solutions from students' perspective was received.

Type of native place you belong to
38 responses



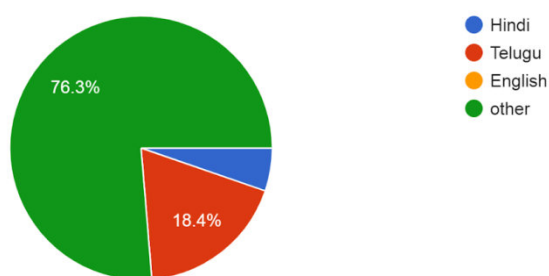
It is observed that 55.3% of students are from village where is no such exposure for the students to develop themselves in gaining knowledge. Usually the students from local area that is from Andhra Pradesh expect to teach them in their native language irrespective of the subject. But English can never be taught in such way. But the teachers are forced to learn students' native language to make them understand and feel comfortable in understanding the concept. Any student feels much convenient with understanding if they are taught through their native language. And this forces any teacher to learn at least one or two words to make her or his students to understand the concept. It is applicable for any teacher from Andhra Pradesh to at least mingle with the students through mother tongue influence. But it is not so easy with the regional students. Because they are not known with regional languages like Maithili, Nepali, Bhojpuri, etc.

Regional students are noticed with less self-confidence

Students are not realizing the importance of learning English as a language. Understanding the concept takes much time for regional students because English is not their medium of their instruction. Mostly regional cannot understand the language especially with pronunciation of even a very simple word. They lack the confidence to speak in English. Students have mentioned that they cannot understand the teacher speaks faster which means a good accent is an obstacle for the students to follow while learning English. Fear of talking in front of student audience is the major obstacle mentioned by the students presenting that they very low self confidence in speaking English.

Other language as their medium of Instruction

Medium of Study at intermediate / +2
38 responses



The survey explains that 76.3% of students are from rural background studied other language as their medium of instruction. 18.4% of students are from Telugu medium. Thus it is observed that most of the students expect the lecture to be written on the board as sentence rather than mentioning just as words. Major obstacles faced by regional students are improper spellings, pronunciation and grammatical errors in English. It is because in most of the cases these students are learning just for the basis of getting pass marks. They never put some effort in all the four communication skills i.e., listening, speaking, reading and writing. Students ask for materials and we give them spoon feeding. Even grammar was taught in Grammar-translation method and they find it difficult in speaking without grammatical mistakes. This method makes them dependent on their mother tongue. The students' ratio to teachers is high, leading obstacle to ineffective teaching. The strength of the class is considerably high and that is one of obstacles faced by the faculty in focusing individual student's growth.

Findings

Encouraging the students may result Positively

Most of the students read English for the sake of examination. Instead of just reading they should understand the basic need of learning English as a language. English acts as a medium of communication between people anywhere in the world. The regional students from Bihar and Nepal find English as a complicated language to learn. Since most of the students are considered to be the first generation learners, they are in need of guidance from teachers in motivating them. They have started learning English as their second language from childhood but still they find it difficult to write or speak even a single sentence without any grammatical error in English. To only solution for this is motivation them individually and make them realize that English is just a language and not knowledge. They should learn English rather than just reading it for the benefit of examination. It is observed that these regional students read English as a subject from the examination point of view. And so they memorize the lessons, reciprocate them in exam and forget what they read later. Most of the students mentioned that they lack self-confidence and they are in need of motivation to mold their language. Hence, encouraging the students and motivating them with some speaking activities may result in positive way for any regional student.

Train them in Pronunciation and Grammar

We cannot expect a standard pronunciation from regional students since their mother tongue interferes much with its pronunciation. These regional students should be taught with phonetics, stress, intonation and pronunciation. Some students have mentioned that they are not known how to pronounce certain words. Also, they find it is as a difficult task to follow the teacher who has good accent. Most of the students mentioned that they have problem with pronunciation. Focusing on phonetics and training the students with pronunciation activities will make the regional students to get developed with their language.

Recommendation

Teachers should implement certain activities for the students to enjoy their learning. The students should know all the four skills of communication. Listening, Speaking, Reading and Writing is very important for any Engineering student to focus on his development. Than just relying on subjects only for examination purpose, teachers should make the students to work on simple researches. This results with much self confidence in learning and gaining knowledge. Not many English language teachers do research on ELT. They would prefer English literature since they are basically and academically students of English literature. Hence, providing skill oriented FDPs or Seminars to deal with Regional students will help the teachers to take care of the students. So that teachers will show their interest to develop the skill by attending training programs. Teachers should avoid Grammar Translation method in teaching grammar. They should use only English as the medium of expression in teaching. Engineering students are provided with only Grammar and skill oriented syllabus in English, but providing simple short poems, short stories and other literature stuffs make students to gain their interest towards learning.

Conclusion

Students living in rural areas consider their teacher as their model believing they can gain knowledge from them. Since these regional students will never have any exposure to hope for development. Hence, a teacher should care every student as individual considering their development in knowledge as well as communication skills. Being an English teacher it is a responsibility to use English as an only medium of source to enrich the students' communication. Teachers should motivate the students to think in English that creates confidence in them to speak English in public. Teachers should create student-friendly and learner centered. Engaging the students in participative learning and providing innovative strategies makes the students to opt for good communication.

References

1. Vijaya Kumar.T, Malekar. I.S, "Difficulties in teaching English to rural students", *International Journal of Research and Analytical Reviews (IJRAR)*, Volume 4, PP.32-38.
2. Strevens, P. (1980). *Teaching English as an International Language*. Oxford: Pergamon Press.
3. John Sekhar.J, "Challenges of Teaching English", *SSRN Electronic Journal*, Dec-2017.
4. William Dharma Raja.B, "Causes of problems in learning English as a second language as perceived by higher secondary students", *I-manager's Journal on English Language Teaching*, Vol-1, No.4, Oct-Dec-2011.

بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

ڈاکٹرای۔ محمد انور حسین

لکچر ران اردو

پی۔ وی۔ کے۔ این۔ گورنمنٹ ڈگری کالج (A)

چنور، آندھرا پردیش۔ 517002

محمد عثمان عارف نقشبندی

راجستھان کا ایک ممتاز رباعی گو شاعر

دنیاۓ شعر و سخن میں دوسری اصنافِ سخن غزل، قطعہ، مثلث، مربع، مسدس، مخمس، مثنوی، قصیدہ اور مرثیہ کے علاوہ رباعی بھی ایک صنفِ سخن ہے جو چار مصرعوں کی پابندی سے تخلیق پاتی ہے۔ اس کا پہلا نام دو بیتی، چار بیتی، ترازو رکھا گیا تھا بعد میں یہ رباعی کے نام سے مشہور ہوئی۔

فن کے اعتبار سے رباعی ایک مشکل صنفِ سخن ہے جس سے عہدہ برآ ہونے کے لیے محض شاعر ہونا ہی کافی نہیں بلکہ اس کے ساتھ ذکاوت، تعمیری صلاحیت، چنگلی شعور اور نئی بصیرت کا ہونا بھی ضروری ہے۔ یہی وجہ ہے کہ دیگر اصنافِ سخن میں دسترس رکھنے کے باوجود بعض شعراء رباعی کے میدان میں پیچھے نظر آتے ہیں اور پھر رباعی کے تمام تقاضوں کو پورا کرنا ہر شاعر کے بس کی بات بھی نہیں ہے۔ ایک طرف ردیف و قوافی کی بندش ہے تو دوسری طرف بحر اور اوزان ہیں جو کسی بھی رباعی گو شاعر سے تصورات و الفاظ پر قدرتِ کاملہ کا تقاضہ کرتے ہیں۔ رباعی تخلیق کرنے کے لیے ان معیاروں کو پیش نظر رکھتے ہوئے جب ہم محمد عثمان عارف نقشبندی کے فنِ رباعی کا جائزہ لیتے ہیں تو معلوم ہوتا ہے کہ اس صنفِ سخن میں موصوف نے اپنی قدرتِ کلام کا ثبوت دیا ہے۔

محمد عثمان عارف نقشبندی 15/اپریل 1923ء کو راجستھان کے ایک مشہور شہر بیکانیر میں ایک معزز علمی اور مذہبی گھرانے میں پیدا ہوئے۔ آپ نے جس ماحول میں آنکھ کھولی وہ نہایت درجہ مذہبی اور ادبی انداز کا تھا۔ ظاہر ہے کہ

عثمان عارف جیسا آدمی جس نے ایسے علمی، ادبی اور مذہبی گھرانے میں آنکھ کھولی ہو وہ آگے چل کر اپنی صلاحیتوں کا براہ راست اظہار کیوں نہیں کرے گا۔ یہ معلوم نہ ہو سکا کہ موصوف نے کب سے شاعری شروع کی لیکن یہ بات یقین کے ساتھ کہی جاسکتی ہے کہ ان کے خاندانی ماحول نے جو بیج ان کی فطرت میں بودیئے تھے وہ بار آور ہوئے اور انھوں نے فارمولوں اور مصروفیات سے ہٹ کر ایسی شاعری کی جس کو نہ رد کیا جاسکتا ہے اور نہ ہی نظر انداز کیا جاسکتا ہے۔

محمد عثمان عارف نقشبندی اردو شاعری کی دنیا میں ایک جانا پہچانا نام ہے کیوں کہ ان کی جو کتابیں منظر عام پر آ کر مقبول ہو چکی ہیں ان میں قومی اور وطنی نظموں کا مجموعہ ”نذر وطن“، ”حمد و نعت و منقبت کے مجموعے“، ”عقیدتِ رسول ﷺ“، ”فیضانِ مصطفیٰ کے مجموعے“، ”قلم کی کاشت“، ”لمحوں کی دھڑکن“، ”رباعیات و قطعات کا مجموعہ“ اور ”نورِ زندگی“ قابل ذکر ہیں۔ اس کے علاوہ راجستھان میں بیکانیر کے ایک صوفی اور ولی پیر محبوب بخش چشتی پر ایک کتاب ”ذکرِ محبوب“ بھی زیورِ طبع سے آراستہ ہو چکی ہے۔

یوں تو موصوف کئی تخلیقات کے خالق ہیں لیکن ”نورِ زندگی“ جو ان کی رباعیات و قطعات کا مجموعہ ہے، یہی میرے آج کے مقالے کا عنوان ہے۔ مجموعہ ”نورِ زندگی“ 1983ء میں شائع ہو کر منظر عام پر آیا۔ اس میں مختلف موضوعات پر لکھی گئی انیس رباعیاں اور ایک سو پچاس قطعات ہیں۔ رباعیوں کے جو بے شمار مجموعے اب تک منظر عام پر آ چکے ہیں۔ ان میں یہ مجموعہ اگر سب سے بہترین نہیں ہے تو چند بہترین مجموعوں میں سے ایک ضرور ہے۔ مالک رام نے ”نورِ زندگی“ کا تعارف لکھا تو گوپی چند نارنگ نے اس کا پیش لفظ تحریر فرمایا۔

اس مجموعے کا تعارف کراتے ہوئے ڈاکٹر ناراج پرن رستوگی نے لکھا ہے:

”مجموعے کے شروع میں ایک صفحہ پر بسم اللہ ہے جس کے بعد مالک رام صاحب کا سپردِ قلم کیا ہوا تعارف گوپی چند نارنگ کا لکھا ہوا پیش لفظ وغیرہ شامل ہیں۔ مالک رام صاحب کا مقام و مرتبہ غالباً ہی میں خاصہ ژرف بینی کا تقاضہ یہ مجموعہ کلام ”نورِ زندگی“ کرتا ہے وہ ہنوز تقاضہ ہے۔“

محمد عثمان عارف نقشبندی نے اس مجموعے میں جو رباعیاں کہی ہیں وہ زیادہ تر متصوفانہ، اخلاقی، معاشرتی اور تہذیبی نوعیت کی ہیں۔ ڈاکٹر سلیمان اطہر جاوید آپ کے مجموعے ”نور زندگی“ پر تبصرہ کرتے ہوئے نیا دور مارچ اپریل 1987ء میں یوں رقمطراز ہیں:

”بے شبہ کہا جاسکتا ہے کہ عثمان عارف نے اس فن کو نہ صرف نبھایا ہے بلکہ کچھ اور جاذب نظر اور کچھ اور دلآویز بنا دیا ہے۔ حسن و عشق کے موضوعات بھی بڑے حسین پیرائے میں اور ولولوں کے ساتھ ادا ہوئے ہیں۔ اس سے قطع نظر اخلاقی، صوفیانہ، معاشرتی اور تہذیبی نہ جانے کتنے عنوانات پر انھوں نے بے حد روانی اور اپنائیت کے ساتھ اظہار خیال کیا ہے۔“

محمد عثمان عارف نقشبندی ایک مصلح کے ساتھ ساتھ ایک عارف باصفا شخصیت کے بھی مالک ہیں اس لیے ان کی رباعیات میں عرفان اور خدا پرستی کا رنگ زیادہ نکھرا ہوا معلوم ہوتا ہے۔ فکر و فن کے اعتبار سے ان کی متصوفانہ رباعیاں ہی ان کی تخلیقی شعور کی معراج ہیں۔

ان رباعیات کے مطالعے سے انکی جو شعری شخصیت ابھر کر سامنے آتی ہے وہ عشقِ الہی میں ڈوبا ہوا ایک عارف با خدا انسان کی شخصیت ہے جو کبھی خدائے برحق و برتر کی ثناء خوانی میں مصروف ہے تو کبھی اس کے بے پایاں عنایات کا شکر گزار بھی۔ وہ دنیا کی بے ثباتی اور حیاتِ انسانی کی ناپائیداری کا ذکر کرتے ہیں۔ ترکِ دنیا کی تعلیم دیتے ہیں اور کبھی فکرِ عقبی کی ترغیب بھی دلاتے ہیں۔

محمد عثمان عارف نقشبندی کسی فارمولے اور فیشن کے شاعر نہیں ہیں بلکہ جو شاعری وہ کرتے ہیں وہ ان کی قلبی واردات اور احساسات کی آئینہ دار ہوتی ہے۔ جو رباعیاں انھوں نے اس مجموعے میں لکھی ہیں وہ اس بات کی دلیل ہیں کہ عثمان عارف نے کبھی اپنے ذاتی تجربات اور احساسات سے الگ ہٹ کر شاعری نہیں کی بلکہ وہی کچھ کہا جو وہ محسوس کرتے ہیں۔

سیاست کے ساتھ ساتھ محمد عثمان عارف نقشبندی پر اردو کی محبت غالب رہی۔ اردو میں شعری کام کر کے فنکارانہ جوہر دکھائے اور اردو ہی نے انہیں دنیائے شعر و سخن میں معروف کر دیا۔ اس طرح انھوں نے اپنے اندر کے فنکار کو زندہ رکھا۔ سیاسی اور سماجی خدمات کے علاوہ عثمان عارف بیکانیر اور کل راجستھان میں مختلف اداروں میں انجمنوں کے زیر اہتمام منعقد ہونے والے سمیناروں، اردو کانفرنسوں اور مشاعروں کی ترتیب و انعقاد کے لیے ایک سرگرم اور فعال رکن کی حیثیت سے کارہائے نمایاں انجام دیا۔ اس طرح انجمن ترقی اردو اور بیکانیر کے جنرل سکرٹری اور ریاستی و مرکزی انجمن ترقی اردو ہند کے ممبر رہے۔ اردو اکاڈمی راجستھان نیشنل اردو رائٹرز اسوسی ایشن کے نائب صدر راجستھان، ساہتیہ اکاڈمی کے رسالے ”نخلستان“ کی مجلسی ادارے کے رکن اور ماہنامہ ”شعلہ و شبنم“ دہلی کے معاون مدیر بھی رہے۔

راقم الحروف پورے وثوق کے ساتھ کہہ سکتا ہے کہ کئی شاعر اپنے سرکاری عہدے کی وجہ سے پہچانے جاتے ہیں اور یہ سرکاری عہدہ ان کا ساتھ چھوڑ دیتا ہے تو ان کی شاعرانہ حیثیت بھی پس پشت چلی جاتی ہے لیکن عثمان عارف ایک ایسے شاعر ہیں جن کی شاعری ان کے عہدے اور حیثیت سے تعلق نہیں رکھتی بلکہ اپنے آپ میں قابل فکر اور قابل پذیرائی ہے۔

راقم الحروف محمد عثمان عارف نقشبندی کے ذاتی حالات سے تو زیادہ واقف نہیں ہوں لیکن ان کی رباعیات کے مجموعے کے مطالعے سے ان کا تخلیقی و فوری، ان کا پختہ فنی شعور، ان کے اسلوب کا باتکین، ان کا مفکرانہ انداز، ان کے الفاظ میں شعریت کا رچاؤ ان کی صاف ستھری زبان اور ان کا دلکش بیان خواہ جس زاویے سے نظر دوڑاتا ہوں تو یہ مجموعے آنکھوں سے چومنے اور سینے سے لگانے کے لائق معلوم ہوتا ہے۔ یہ ایک دلکش خوشبو ہے جو مشام جان کو معطر کیے دیتی ہے۔

محمد عثمان عارف نقشبندی کی رباعیوں کے مطالعے سے یہ پتہ چلتا ہے کہ آج انسان کو ہزار طرح کی دولت و ترقی نصیب ہونے کے باوجود بھی وہ امن و سلامتی، سکون و اطمینان، عزت و شان سے جینے کے لیے ترس رہا ہے۔ سکون و اطمینان کی زندگی انسان کے لیے ایک خواب بن گئی ہے اور ساری کائنات امن و سلامتی کے لیے بے قرار ہے۔ مادیت کا طوفان فطرت کے نشان کو پار کر رہا ہے۔ زندگی کا سارا نظام درہم برہم ہوتا جا رہا ہے۔ قدم قدم پر بے چینی اور اضطراب کا سامنا ہے۔ آسمانی مصیبتوں اور سیلاب و حوادث کی پریشانیوں کے باوجود انسان تشکیک بے دینی اور الحاد کی ویران اور پُر خار وادیوں میں جکڑا ہوا ہے۔ انسان ان ملحدانہ خیالات سے باز آنا نہیں چاہتا ہے۔

اسی لیے عثمان عارف انسان کو اپنے ملحدانہ خیالات سے باز آنے، اللہ سے بغاوت نہ کرنے اور شیطانی حرکات چھوڑنے کی تلقین کرتے ہوئے کہتے ہیں:

سیلاب و حوادث کی فراوانی ہے
انسان کو کس درجہ پریشانی ہے
اللہ سے پھر بھی بغاوت قائم
جو کام ہے انسان کا شیطانی ہے

مذہب کے موضوع پر محمد عثمان عارف نے جو رباعیاں کہی ہیں۔ ان میں مذہب کی برتری اور اس کے فضائل کو بیان کیا ہے۔ مذہب اور خدا کی طرف عثمان عارف کا رجحان طبعی زاد فطری ہے۔ فکری اور نظری اعتبار سے بھی انہوں نے ان صداقتوں کو تسلیم کیا ہے۔ بہبودی افراد اور اصلاح معاشرہ انسانی کے لیے بھی وہ مذہب کی ضرورت پر زور دیتے ہیں۔ ان کی نظر میں مذہب منزل دو جہاں کا رہبر ہے جو انسان کو اعلیٰ تر منازل سے آشنا کراتا ہے۔ اس کے برعکس الحاد کو موصوف تباہی و ہلاکت کا پیش خیمہ تصور کرتے ہیں۔ آپ کے یہاں مذہب کا تصور بہت گہرا ہے۔ اس کے علاوہ مذہب کے تصور اور عمل کے بغیر خدا تک پہنچنا ناممکن سمجھتے ہیں اور ان کا کہنا ہے کہ صحیح طریقے سے مذہب پر عمل پیرا نہ ہوں تو تباہ و برباد ہو جائیں گے۔

آپ کے اس انداز میں کس قدر سچائی ہے ملاحظہ ہو:

ممکن ہی نہیں کام قرینے کے بغیر
چڑھ سکتے نہیں بام یہ زینے کے بغیر
مذہب نہ رہے اور خدا تک پہنچیں
لازم ہے کہ ڈوبیں گے سفینے کے بغیر

آج انسان اطلاعی تکنالوجی میں کافی ترقی کر چکا ہے۔ اس کے ذریعے ساری دنیا گلوبل ویج میں تبدیل ہو گئی ہے۔ ہزار ہا میل کی دوری پر رہنے والے اپنے بھائیوں سے وہ اس طرح گفتگو کر سکتا ہے گروہ اس کے سامنے ہیں۔ اس

طرح حیران کن کمالات آج انسان دکھا رہا ہے لیکن افسوس اپنے پڑوسیوں یا ہمسایوں سے میر رکھتا ہے۔ ان سے کوئی ہمدردی نہیں دکھاتا ہے۔ اس لیے اس کے سارے کمالات بیکار اور فضول ثابت ہو رہے ہیں۔ حرب و ضرب کے اس دور میں انسان لاکھ اپنی ترقی پر ناز کرے اگر اس کی ایجادات اور اس کے کمالات انسانی نسل کو آپس میں محبت اور ہمدردی کی طرف مائل نہیں کرتے تو یہ ترقی فضول ہے۔

اس لیے عثمان عارف ترقی کے اس دور میں بڑھتے ہوئے تشدد پسند رویوں پر طنز کرتے ہوئے کہتے ہیں:

طوفان تو اٹھتا ہی چلا جاتا ہے
سیلاب تو اُٹھ ہی چلا آتا ہے
انسان کی کشتی کو ترانے والا
انسان تو ڈوبا ہی چلا جاتا ہے

.....

انسان گرفتار مصیبت ہے ابھی
غفلت کی نہ پوچھو وہی غفلت ہے ابھی
دیکھی نہیں جو سر سے قیامت گذری
اک اور قیامت کی ضرورت ہے ابھی

.....

حضرت عثمان عارف نے جہاں انسان کی صلاحیتوں کی داد دی ہے اس کے کارہائے نمایاں کو سراہا ہے وہاں اس کی بے بضاعتی سے بھی چشم پوشی نہیں کی ہے۔ انسانی علم و حکمت نے حقیقت کا راز جاننے کے لیے اب تک جو کوشش کی ہے وہ مُسَلَّم ہے۔ پھر بھی اسے ایک پھول کی پتی کے رنگوں کی وجہ تخلیق کا پتہ نہیں۔ ساری کائنات میں کتنے عجائبات ہیں انسان کو کچھ خبر نہیں۔ ابھی تو انسان قدرت کے کرشموں کا پوری طرح جائزہ بھی نہیں لے سکا۔ چاند پر پہنچنے کی سعادت بہت بڑی کامیابی سہی لیکن جب اس بسیط آسمان کی پنہائی کا اندازہ کرتے ہیں تو عقل و علم عاجز ہو جاتے ہیں۔

ہرچند حقیقت آشکار ہے پھر بھی علم و عقل اپنی بے بضاعتی پر مجبور اور شرمندہ معلوم ہوتا ہے:

ہے اصل حقیقت سے تو مجبور ابھی
تاریک ہے دل آنکھ ہے بے نور ابھی
اے چاند کی دنیا پہ پہنچنے والو
انسان کی منزل ہے بہت دور ابھی

.....
ملتی ہے یہیں یوں بھی عارف منزل
اس راہ میں درکار ہے عزم کا مل
افلاک کی سرحدوں کو چھونا آسان
منزل پہ محبت کی پہنچنا مشکل

.....
تصوف اور معرفت اردو شاعری کی جان ہے اور حضرت عارف نقشبندی سلسلہ طریقت کے بزرگ اور صوفی نہ
سہی مگر عارف ضرور ہیں۔ تصوف اور معرفت کا رنگ آپ کے یہاں ہے۔ آپ نے تصوف اور معرفت کے باریک
ترین نکات کو اپنی شاعری میں پیش کیا ہے۔ آپ کی ایسی عارفانہ رباعیات میں ایک عجیب سرور و کیف ملتا ہے:

آنکھیں ہوں تو کھل جائے ابھی رازِ بیاں
بیکار ہے سرگرداں یہاں اور وہاں
باریک سا پردہ ہے نظر سے دل تک
ہو جائے اگر دور حقیقت ہے عیاں

دیدار کے طالب کو نہ یوں ترساؤ
غنجوں میں کبھی پھول میں تم شرماؤ
یہ پردہ رنگین تو بہت دیکھ لیے
اب چاند ستاوں سے نکل بھی آؤ

.....

عثمان عارف کے یہاں صرف فلسفہ، تصوف اور معرفت و مذہبی خیالات ہی موضوعِ سخن نہیں ہیں بلکہ حیات و کائنات کا گہرا مطالعہ بھی ہے۔ آپ نے صنفِ رباعی کو محض ذہنی عیاشی کا مرکز ہی نہیں بنایا اس سے بڑا کام بھی لیا ہے۔ بلند انسانی قدروں کی تعلیم دی اور زندگی کے مسائل کا ذکر بھی کیا۔ قدم قدم پر انسان کو عزم اور ہمت سے کام لینے اور ہر صورت میں حالات کا مقابلہ کرنے کا پیغام دیا ہے:

کیوں گردشِ ایام سے گھبراتا ہے
ہر دورِ زمانہ کا گذر جاتا ہے
وہ فعلِ خزاں میں بھی شگفتہ خاطر
کانٹوں میں بھی گل بہار دکھلاتا ہے

.....

خاکوں ہی سے تصویر بنا لیتے ہیں
اسباب سے تعمیر بنا لیتے ہیں
ایسے بھی زمانے میں جواں ہمت ہیں
تدبیر سے تقدیر بنا لیتے ہیں

صنفي حیثیت سے رباعی کی راہیں بڑی پُر خار ہیں۔ احتیاط کے باوصف فنی غلطیوں کا احتمال رہتا ہے لیکن عثمان عارف کی رباعیاں فنی خامیوں سے پاک ہیں۔ پھر بھی بغیر کسی ہچکچاہٹ کے یہ کہا جاسکتا ہے کہ صنف رباعی میں آپ کے یہاں وہ احساسِ جمال ناپید ہے۔ جو فراق گورکھپوری، امجد حیدر آبادی، جوش ملیح آبادی، ساغر نظام کا حصہ ہیں۔ حالاں کہ ان کی رباعیوں میں فکری عمق، جوش، درد مندی، روانی، انسانیت کا غم، مذہب کائنات کا مطالعہ اور تہذیبی اقدار موجود ہیں۔

غرض مختصر طور پر کہا جاسکتا ہے کہ عثمان عارف نے صنف رباعی کو بھرپور طور پر اپنایا اور اپنے خیالات، احساسات، تجربات اور مشاہدات کو رباعیوں کی شکل میں پیش کیا ہے۔ آپ کا اسلوب کلاسیکل اور انداز فکر عصری ہے۔ زبان و بیان پر مکمل دسترس ہے۔ ”نورِ زندگی“ میں زندگی کا شعور بھی ہے اور محبت کا نور بھی۔ حساس دلوں کی آواز بھی اور محبت کا وجدان بھی۔ ان رباعیات میں وہ تمام پہلو نمایاں ہیں جن سے انسانی حیات کسی نہ کسی طور پر متاثر ہوتی ہے۔