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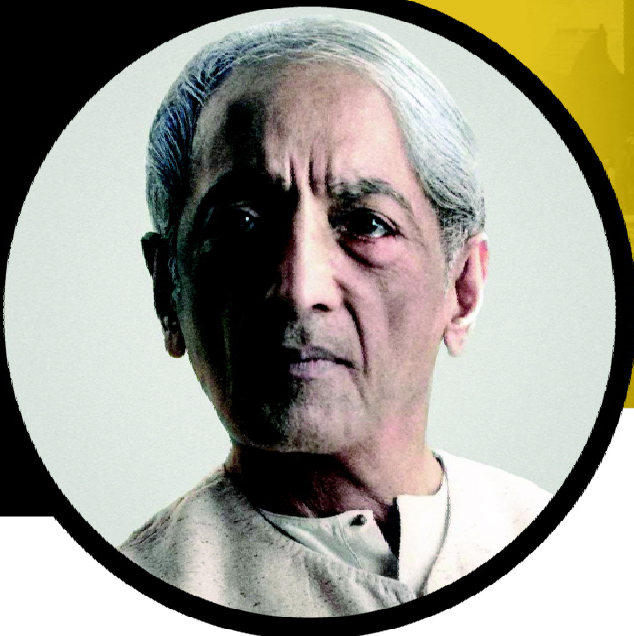


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DIMENSIONS OF EDUCATION

An International Journal of Education
and Research -English Quarterly

Exploring Charles Dickens's Hard Times: A Critique of Industrialization, Utilitarianism, and Social Injustice



JIDDU KRISHNAMURTI



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Station Road, and 'Nanasu' J.T. Math Road,
GADAG-582 101 Dist. : Gadag.
Karnataka State (India) Phone : 08372-200527
email : dimensionsofedn@gmail.com

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Reimagining School Education in India : The Time to Transform Is Now

India stands at a crossroads in its educational journey. With the world's largest school-going population-over 250 million children-the stakes for the future could not be higher.

For decades, India's school education system has operated on a model designed for a different era-one focused on rote learning, rigid curricula, and exam-driven pressure.

The 2020 National Education Policy (NEP) offered a refreshing vision for change: holistic learning, foundational literacy, reduced curriculum load, and integration of vocational education. But policy is only the first step-implementation is the true test. As we move forward, transforming school education in India must move from aspiration to action.

1. From Rote to Relevance
2. Empowering the Teacher
3. Equity and Access
4. Rethinking Assessment
5. Making Learning Joyful

A Call to Collective Action

Transforming school education in India is not the job of the government alone. It requires collaboration between policymakers, educators, parents, students, and civil society. It demands long-term investment, not quick fixes. Most of all, it requires a cultural shift in how we define success-not by marks, but by meaning.

India has the potential not just to reform its education system, but to reimagine it as a model for the world: inclusive, innovative, and rooted in its own diverse heritage. The children in our classrooms today will shape the India of 2047. The education they receive must be worthy of that responsibility.

The time to transform is not tomorrow. It is now.

- **Dr. S.B. Yadawad**
Editor

YOGA - THE SPIRIT OF LIFE

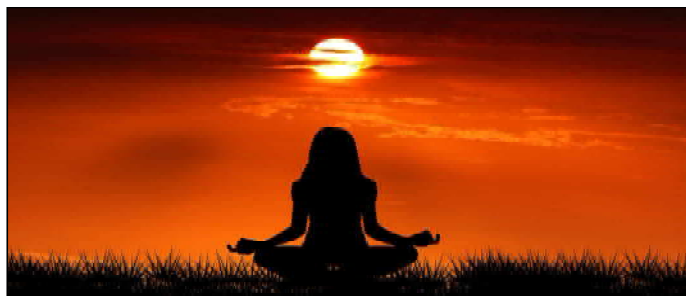
✉ Pavitra M. Hugar, Lecturer, Dept. Of Commerce, University First Grade College, Mangalore University, Mangalagangothri

ABSTRACT

Yoga makes us find the peace which lies within us. Many people practice yoga because of the physical benefits they experience from it. They might attribute feeling more grounded, calmer and happier to doing exercise. In actuality, they're likely experiencing this "zen" feeling from both the movement and the intention behind it. Yoga, at its core, is a spiritual practice. Connecting your breath to your movements is a spiritual practice. By practicing yoga, you're naturally moving with intention. It's laced within every movement and every breath. When you ground down into your feet or sit bones, you're learning to be present in your body while also aiming to connect with the ground beneath you. The term "spirituality" might throw some people off, but it doesn't mean religion. It can mean finding purpose in life, mindfulness and presence, a broadened worldview, or maybe just plain happiness.

INTRODUCTION

Yoga is an ancient Indian science with spiritual philosophy. Yoga means joining, combining. It is derived from the Sanskrit root 'yuj' which means 'union'. Yoga is a science and also art. The practice of yoga integrates the body to the mind, mind to the soul and soul to the God. This leads to perfection by helping us to understand our own natures and to live harmoniously with our fellow men. Yoga keeps our body and mind in tune and success comes our way all through. Yoga can be practiced by all irrespective of race, colour, caste, creed, sex and age. Most people are aware of only two aspects of yoga, the asanas and meditation. Yoga is more than these two aspects (schools of yoga).



You get to define what spirituality is for you, but if you're practicing yoga, you're likely practicing spirituality whether you realize it or not. This article will explore the origins and philosophy of yoga and spirituality, how yoga is a spiritual practice, alongside the many benefits of practicing yoga. If you're curious about how to deepen your yoga practice and learn about the different aspects of spirituality incorporated into this world, then keep reading.

While most people take up yoga training for its physical benefits, the practice of yoga can benefit us in

various other ways. Yoga is deeply rooted in spirituality and many of the postures have deeper objectives that go beyond simple stretching and strengthening of muscles. The holistic effect that is attained through yoga enables practitioners to not only improve their physical strength and flexibility, but also their emotions, mentality and concentration.

Yoga is the culture of tomorrow. It is a science which deals with the development of the human personality and which leads to development of the human personality and which leads to awakening of untapped energy sources within the brain and mind. The practice of yoga is not new. Ancient rishis, saints and sages have been talking about it for the last fifty thousand years. They spoke about it, not as a religion or philosophy, but as a way of life that could lead to the development and awakening of our consciousness and energy.

When we think of yoga, we mean development of the human personality in every aspect. When we practise yoga, we practise it for attaining balance, harmony and equilibrium in all aspects of our personality and expression. We do not believe that by inducing certain states of consciousness or by making moral changes, we can improve the quality of our life. We believe that by experiencing life as it is, and by discovering and knowing our limitations, we can evolve mentally, intellectually and psychically. There is an urge in every one of us to find happiness, tranquillity and harmony. We would like to attain psychological balance and avoid the tensions and conflicts of daily life. Many scientific investigations have been made into yoga, and we have seen that with the practice of asanas, pranayama and other yogas, we can attain this balance, harmony and tranquillity.

Today, in our world, we find that we need two items to make our lives a complete success. The first item which we lack is vitality, which is not physical strength, but inner strength, willpower, clarity of mind and the ability to perform every action with perfection. The second item we lack is tranquillity. We are so engrossed in our day to day activities, in our intellectual and emotional tensions, that we have lost contact with our inner nature. Man has two forms of expression. External development is one aspect and internal development is the other. In yoga we try to combine both aspects. On the external level we develop the faculties of the intellect and the senses. We also develop our emotional expression, but on a very superficial level. On the internal level, many yogic techniques bring about a state of inner awareness. By becoming aware of our mind and our mental perceptions, and by integrating this awareness into our day to day life, we can become more balanced, harmonious and complete.

Through yogic techniques we can develop the ability to relax in any situation and under any condition. We can also develop the capacity to concentrate, to collect all our dissipated energies and focus them at one point. Then the combination of mental force and vital force becomes a very powerful tool in opening up the different dimensions of the human personality. Personality has always been a problem of mankind. We do not know how to face ourselves. We become depressed and we do not know how to handle our depression. We become happy and we do not know how to handle our happiness. We become tense and we do not know how to handle our tension. We have an emotional outburst, we get angry and we do not know how to handle our anger.

Psychology tells us that in different states of mind we have different experiences. Some are sensory and some are mental. When we try to become aware of the difference between the external and the internal experience, we get lost. There are external situations which influence our life, and internal situations created by our own selves, which also influence our life. Whatever we try to do or to achieve, there is always a lack of harmony and coordination between the different faculties of our personality.

Yoga begins when there is conflict and tension, when there are disruptive forces working in our life and personality. In the Bhagavad Gita, Krishna taught yoga to Arjuna on the battlefield, when Arjuna was full of conflict and tension, and unsure of his course of action. At that moment of conflict, Krishna said, "Now you have to practice yoga in order to understand your position in life."

So, in order that Arjuna could understand his position, course of action, emotions and behaviour, all the techniques of yoga were taught there, on the battlefield.

The same practices were later evolved and developed by the different saints and rishis. One was Patanjali, who claimed in his verses on yoga, the Yoga Sutras, that yoga is a form of discipline. It is a form of controlling mental conflicts, different patterns and fluctuations of mind. It is a way of controlling the dualities that we face in life. Patanjali does not say that yoga is for health and beauty of the body. Krishna did not tell Arjuna to do yoga for health and beauty. They both geared the whole practice of yoga towards knowledge and understanding of the human mind. In this sense, there is no difference between the yoga of Krishna and the yoga of Patanjali. In Krishna's yoga we find the war talking place outside, but in the yoga of Patanjali the war takes place within.

KNOW YOURSELF

The first principle of yoga we have to remember is to know ourselves. Socrates said, "Know thyself." Shakespeare said, "To thine own self be true." There are dormant centres of perception, of energy, which we can know and tap inside ourselves. We can awaken these centres after we have understood the expressions of our personality, after we have resolved the conflicts that go on in our personality, after we have resolved the conflicts that go on in our emotional and intellectual areas. There are many people who have been practising meditation for the last twenty, thirty, forty or fifty years, but they have not been able to gain anything, because they fight with their minds and with themselves.

ACCEPT YOURSELF

The second principle of yoga is to watch, observe and accept ourselves. There is a beautiful poem by St Francis, which reads :

***God grant me the serenity to accept
the things I cannot change,
the courage to change the things I can,
and the wisdom to know the difference.***

We have to learn to accept and to observe objectively, not subjectively. When we become subjective towards a problem, what happens to the mind and awareness? What happens to the consciousness and to the level of energy in our system? It is all dissipated and we reach a state of very high tension.

However, if we just sit back and observe for a few minutes with a cool mind, without becoming agitated or

involved with the problem, then we can easily discover the solution. So, observe and accept is the second principle in yoga. Due to our inhibitions and ambitions we struggle in life, we want to fight with life. Because of our rashness and hard-headedness, we go through life like a bull in a china shop. This is where we fail. How do we develop mental clarity and objective awareness? There is only one answer - yoga.

NON-ATTACHMENT

The third principle of yoga is non-attachment. Whatever we do, whether it is very simple or very complicated, we should do it for the sake of experience; we should not expect any result from it, either positive or negative. When we perform an action, there is an expectation behind it. To have an expectation is part of our nature. Whether we call it selfish or selfless, in both there is expectation. We expect the result to be beneficial, to give satisfaction, and we expect to gain name and fame.

Name and fame is not the problem here; we all want name and fame. But when we do not achieve what we want to achieve, then there is conflict because of the expectation. Whatever actions we do, whatever thoughts we think, whatever emotions we feel, again there is conflict. So, in yoga it is said that we should perform all actions with perfection, but without expectation. We should develop this attitude if we want to have clarity of mind and discover the different dimensions of our mind.

RELAXATION

The fourth principle of yoga is relaxation. How should we relax? Not by sensual pleasures or enjoyment, not by acquiring things, not by experiences that give us some temporary happiness or feeling of peace. Relaxation in yoga does not mean physical or emotional relaxation. Relaxation here means letting go of our personality, letting it run wild, letting it express itself. But in order to do this one part of our self has to be relaxed. Now you might be holding a cigarette in one hand and a drink in the other hand, but that is not really a state of relaxation. Relaxation here simply means letting go.

Let yourself go in all the different areas of your work; let yourself go in all the different channels that are open to you. Mentally find out which is the best channel and which is the best course of action. With a cool mind, first think of the problems, not of the benefits. If you can work out the problems, if you can find the solutions, you will have attained inner relaxation. But, of course, we try to look at all the benefits before and all the problems later, and there

is no relaxation in that. There must be relaxation of awareness. You are aware, fully alert, fully awake, but in that state of alertness there is complete relaxation.

These are some of the principles of yoga. If we can adopt them in our daily lifestyle, our awareness will awaken gradually and slowly, and we will be more in control of our mind. Right now, the mind is the master and we are the slave. If the mind says, "Do this," we do it. If the mind says, "Do not do this," we do not do it. If the mind says "Accept this," we accept it. If the mind says, "Do not accept this," we do not accept it. Most of our life is governed by the mind and the different manifestations of mind.

This ancient science goes far beyond the mere physical aspects, by way of deepening the connection between mind, body and most important of all the spirit. The spiritual aspect of yoga can help yogis develop integration of the inner being as well as oneness with the Supreme Consciousness. And it starts with the body and the asanas or postures. In yoga, the nature and environment that surrounds us is essential, witnessed in the many Sankrit and English terms for asanas (postures) that are derived from animals and plants and that pertain to their special characteristics or qualities, such as the Lotus for example. Apart from these, some receive their inspiration from the Earth and others have their roots in ancient spirituality. However, each name has a deeper, hidden meaning.

Let's examine the nature of some of those postures in detail.

PADMASANA - LOTUS POSE

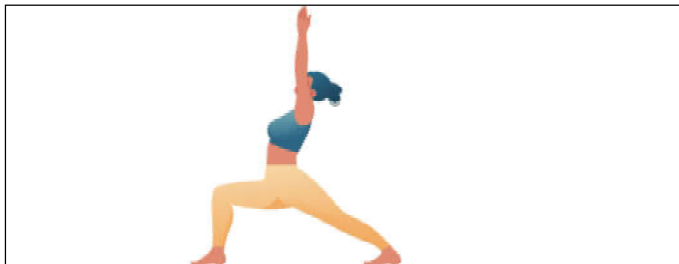


In the ancient traditions of Asia, the lotus flower is often a symbol of purity and "spontaneous" generation, representing divine birth, spiritual development and creation itself. A lotus flower is on a journey from its roots embedded in the muddy water, stemming upward, emerging into the light and blooming into the beautiful flower we know it to be. Symbolically it represents the perfection of the human being, who is with her body or "roots" in the world (like the roots of the lotus in the mud of the lake), but with her mind dwelling in the Divine, such as the lotus blooming above the surface of the water.

When the lotus pose is perfected one attains complete detachment which is symbolized by the petals of the lotus flower. When splashing water onto the lotus petals and will never stick to them. Similarly the yogi will not remain attached to anything in the world even though he is "drenched" with the water of the world.

The lotus Pose is the regular seated meditation posture yogis assume for meditation and pranayama (breathing exercises). Breath is an energizing and purifying aspect for the human body. Deep, slow breathing energizes and purifies our bodies. Yoga practice helps us tune into our self, allowing us to discover our true nature and exquisite potential.

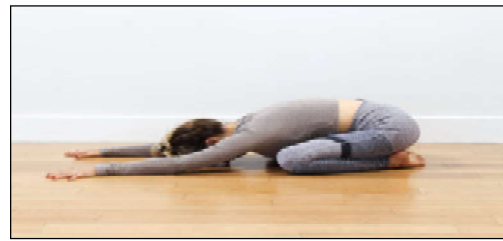
VIRABHADRASANA - WARRIOR POSE



Yogic philosophy has it that one's biggest enemy is self-ignorance. Being ignorant or not fully aware of yourself can cause intense suffering for yourself and others. The Warrior posture allows one to embody the idea of courage, bravery and strength necessary to face your own inner demons - overcoming ego and ignorance. The three primary Warrior poses in yoga all involve strong extended arms and an active, engaged core. The Warrior posture helps your body develop not only physical strength, but also the spiritual readiness for the inner battles that the mind and heart must wage and win.

BALASANA - CHILD'S POSE

It seems to be one of the simpler poses, yet there is more to the child's pose than meets the eye. In this pose, you kneel on the ground with your legs tucked underneath, your torso resting on the thighs, arms by your side or stretched forward and palms resting on the floor. This posture symbolizes and intensifies your connection to the child like attitude of surrender. The goal of this exercise is to be in a state of non-doing, especially important if you are tense, highly-strung or stressed out. This posture is about creating a shell of quiet tranquillity, allowing the spirit to rest and nurture itself, removed from external pressures. The emphasis on proper breathing in this posture further



strengthens the connection between mind and body, inducing a state of calm awareness that helps you to fully relax. You allow yourself some quiet time for your mind, heart and body to integrate, resulting in a state of deeply satisfying wholeness.

VRKSHASANA - TREE POSE



A popular asana practiced in yoga, the objective of the Tree Pose is to achieve balance. However, in this instance balance is not achieved in a rigid manner, but much like a tree. Your foot stays rooted in the ground while your body may gently and almost imperceptibly sway, like a tree does in the wind. The freedom of movement coupled with balance and being rooted develops the spiritual acceptance of your body's firm, yet transient position in the world.

SHAVASANA - CORPUS POSE

Most yoga sessions end with Shavasana, or the "Corpse Pose". It's a relaxation pose, performance while lying on your back with your eyes closed and your arms extended alongside your body. This asana requires your body to be completely still so your mind can be drawn inward, allowing you to indulge your inner self without any distractions, be it movement or thought.

The spiritual aspect of the posture invokes surrender, giving up one's intentions, goals and worldly pursuits in acknowledgement of the fact that there is a sense of completion and peace to be found in mere stillness and tranquility. It's important to remember that the yogic version of death is seen as the culmination of one's life, making it highly important for all. This posture mimics death in a

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IMPACT OF MULTIMEDIA RESOURCE MANAGEMENT (MRM) PROGRAMME ON SCHOOL TEACHERS TEACHING EFFICIENCY, CONTENT DELIVERY, COLLABORATION AND ENGAGEMENT

✍ Miss. Jagadevi Nandikol, Research Scholar, Department of Education, K.S. A. WomenUniversity, Vijayapura, Karnataka

✍ Dr. Prakash K. Badiger, Associate Professor, Regional Institute of Education-NCERT, Nellore, Andhra Pradesh.

ABSTRACT

With the increasing integration of technology in education, Multimedia Resource Management (MRM) programme has emerged as a key tool in facilitating teaching and learning processes. This study investigates the impact of MRMP on school teachers, focusing on teaching efficiency, content delivery, collaboration and engagement. Using a mixed-methods approach, data was collected from 60 teachers across primary and secondary schools through surveys and in-depth interviews. Findings reveal that while MRMP contributes positively to teaching efficiency, content delivery, collaboration and engagement, it also introduces challenges related to digital literacy and time management. The paper concludes with recommendations for training and policy implementation to maximize the benefits of MRMP in educational settings.

Key terms: Multimedia Resource Management (MRM)programme, teaching efficiency, content delivery, collaboration, and engagement

INTRODUCTION

The integration of multimedia in education has transformed traditional pedagogical methods, enabling more dynamic and interactive learning environments. Multimedia Resource Management (MRM) Programme is repository that, provides to create, organize, and share digital content such as videos, interactive simulations, images, and audio files. As educational institutions strive to modernize their teaching strategies, understanding the real-world impact of such tools on educators is essential. There is an urgent need to develop a platform where an opportunity is provided to both teacher and learner to systematically store, edit resources and use through a single window in systematic form.

Previous studies (e.g., Johnson & Brown, 2021; Lee et al., 2019) have highlighted the role of educational technology in enhancing learning outcomes and increasing student engagement. However, limited research specifically addresses how MRMP affects school teachers' daily practices, including lesson planning, resource curation, and time allocation. The theoretical underpinning of this study is based on the Technology Acceptance Model (TAM), which explains user acceptance of technology based on perceived usefulness and ease of use.

STATEMENT OF THE PROBLEM

The Researcher undertaken the study "Impact of Multimedia Resource Management (MRM) Programme on

School Teachers teaching efficiency, content delivery, collaboration and engagement"

OBJECTIVES OF THE STUDY

The following objectives are framed for the present study;

1. To examine the impact of MRMP on school teachers teaching efficiency.
2. To assess the impact of MRMP on school teachers content delivery.
3. To find resource sharing and collaboration in school teachers.
4. To evaluate changes in school teachers' engagement in the classroom.

HYPOTHESES OF THE STUDY

The following research hypotheses are framed for the present study;

1. There is a significant increase in teaching efficiency of school teachers
2. There is a positive changes school teachers content delivery
3. There is a markable resource sharing and collaboration in school teachers
4. There is a significant improvement school teachers' engagement in the classroom

OPERATIONAL DEFINITION OF TERMS USED

1. **Multimedia Resource Management (MRM) Programme:** This is a software which will have the facility to input desired multimedia material on any topic for teaching-learning. The software will have facility for the teacher to add, copy and delete digitized multimedia teaching-learning materials such as text material, PPT, Audio, video, pictures, e-books and website links etc with additional features and make use of them in their classroom teaching.

VARIABLES OF THE STUDY

The following variables were considered for the present study;

1. **Independent Variables :** MRM programme
2. **Dependent Variables :** Teaching efficiency, content delivery, collaboration and engagement

LIMITATIONS OF THE STUDY

This study was conducted with ICT-pro school teachers from Vijayapura district only.

LITERATURE REVIEW

MULTIMEDIA IN EDUCATION

Multimedia, including text, audio, video, graphics, and animations, enhances cognitive engagement and learning retention (Mayer, 2009). However, its effectiveness depends on the educator's ability to manage and deploy it meaningfully.

TEACHERS AND TECHNOLOGICAL INTEGRATION

Teachers serve as role models and technology facilitators for pre-service teachers. Research highlights gaps in digital competence and practical application of multimedia tools among educators (Tondeur et al., 2017).

PROFESSIONAL DEVELOPMENT PROGRAMMES

Effective professional development includes contextual, collaborative, and sustained engagement. Multimedia Resource Management Programmes focusing on both technical and pedagogical aspects show promise but require empirical validation (Desimone, 2009).

METHODOLOGY

RESEARCH DESIGN

A mixed-methods approach was adopted to capture both quantitative data and qualitative insights.

SAMPLE

A structured survey was distributed to 60 teachers

from 10 different schools of Vijayapura district followed by semi-structured interviews with 20 selected participants.

TOOLS

- **Survey :** Focused on perceived ease of use, frequency of MRMP utilization, satisfaction, and impact on teaching efficiency.
- **Interviews:** Explored experiences, challenges, and perceived benefits or drawbacks of MRMP.

DATA ANALYSIS

Quantitative data were analyzed using descriptive statistics and regression analysis, while thematic analysis was employed for qualitative data.

RESULTS

1. Increased teaching efficiency : 70% of respondents reported that MRMP allowed them to reduce the time spent preparing lessons by at least 20%. Teachers appreciated features such as searchable content libraries and integration with learning management systems.

2. Enhanced content delivery and engagement : More than 80% of participants indicated improved classroom content delivery, citing better student engagement when lessons included multimedia elements curated through MRMP platform.

3. Collaboration and Resource Sharing : Teachers highlighted the collaborative benefits, such as sharing lesson plans and media resources across schools. 65% believed that MRMP improved communication and resource alignment.

CHALLENGES

KEY CHALLENGES INCLUDED

- **Digital Literacy :** 30% of teachers, especially older ones, reported difficulties navigating MRMS platforms.
- **Time for Adaptation :** Some educators noted that while MRMP eventually saved time, the initial setup and learning phase were time-consuming.
- **Technical Issues :** Unreliable internet access or outdated hardware posed barriers to effective MRMP use in some schools.

DISCUSSION

The data suggests that MRMP positively impacts teaching efficiency and engagement but underscores the need for targeted professional development. Teachers who

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EXPLORING CHARLES DICKENS'S HARD TIMES : A CRITIQUE OF INDUSTRIALIZATION, UTILITARIANISM, AND SOCIAL INJUSTICE

✉ Prof. Vanamala S.M., Professor of English Research Scholar Department of Studies in English, Sir M. Vishveswaraiah P.G. Manasagangothri Centre, Tubinakere, Mandya.

✉ Lakshmisha P.R., Department of Studies in English, Mysuru University of Mysore

ABSTRACT

Charles Dickens's Hard Times is a trenchant social critique set against the grim realities of the Industrial Revolution in 19th-century England. Through the intertwined lives of characters in the fictitious industrial town of Coketown, the novel explores key themes such as the dehumanizing effects of utilitarianism, the exploitation wrought by industrial capitalism, the conflict between imagination and fact, and the social inequalities embedded in Victorian society. Dickens's narrative interrogates the mechanization of human life, the suppression of emotional and moral development, and the harsh conditions faced by the working class. Through vivid characterization and symbolic settings, Hard Times offers a compelling commentary on the social and ethical challenges posed by rapid industrial growth and utilitarian philosophy, making it an enduring work of social realism and Victorian critique.

Keywords : industrialization, utilitarianism, social reform, imagination vs. fact, class struggle

INTRODUCTION

Charles Dickens's *Hard Times* (1854) emerges as a powerful literary response to the sweeping changes unleashed by the Industrial Revolution in Victorian England. Set primarily in the fictional industrial town of Coketown, the novel presents a stark portrayal of the lives of factory workers and the industrial bourgeoisie, exposing the human cost of mechanization and utilitarian doctrine. Dickens challenges the prevailing social and economic attitudes of his time—particularly the emphasis on facts, efficiency, and economic utility—through a narrative that foregrounds emotional repression, moral bankruptcy, and class conflict. At its core, *Hard Times* is a critique of how industrial capitalism and utilitarian education marginalize the human spirit and perpetuate social inequality. This article examines the novel's central themes, its character dynamics, and Dickens's narrative strategies, demonstrating how *Hard Times* remains a vital exploration of the tensions between industrial progress and human values in the Victorian era.

INDUSTRIALIZATION AND ITS DISCONTENTS

A primary focus of *Hard Times* is the harsh impact of industrialization on individuals and communities. Coketown, with its smoke-belching factories, monotonous labor, and polluted environment, stands as a symbol of industrial desolation and social decay. Dickens contrasts the mechanized, colorless town with the rich inner lives and imaginative capacities of his characters, revealing the alienation and suffering wrought by industrial capitalism. The novel foregrounds the plight of workers like Stephen

Blackpool, whose honesty and dignity persist despite his brutal working conditions and social ostracism. Dickens uses Coketown not merely as a setting but as a living metaphor for the dehumanizing effects of industrial progress, where human beings are reduced to mere cogs in the factory machinery. The relentless drive for production and profit eclipses empathy and justice, exposing the social fissures beneath Victorian prosperity. Charles Dickens' *Hard Times* is fundamentally a critique of the Industrial Revolution and its dehumanizing effects on society. Set in the fictitious industrial town of Coketown, the novel exposes the bleak realities of mechanization, utilitarian philosophy, and the relentless pursuit of economic progress at the expense of human values and individuality. Dickens paints industrialization not as a symbol of progress, but as a force that breeds alienation, exploitation, and moral impoverishment.

The stark, oppressive atmosphere of Coketown is one of the novel's most vivid representations of industrial discontent. Dickens describes the town as a place dominated by smoke, machinery, and uniformity—where the monotonous rhythm of factory life erodes creativity and joy. The "factories and furnaces" are not merely background settings but active agents of oppression that shape the lives and psyches of its inhabitants. Workers are reduced to cogs in the industrial machine, valued only for their labor output, while their physical and emotional needs are systematically ignored. The character of Stephen Blackpool embodies the plight of the working class trapped in this mechanized world. His honest, hardworking nature and tragic fate highlight the injustices faced by laborers,

who endure harsh working conditions, social stigma, and lack of legal protections. Stephen's personal struggles underscore the broader theme of industrial alienation-he is isolated not only socially but emotionally, caught between an unyielding economic system and his own moral compass. Dickens uses Stephen's story to evoke sympathy and to call attention to the urgent need for social reform.

Industrialization also breeds a rigid class hierarchy, which Dickens critiques through the contrast between the utilitarian factory owners and the impoverished workers. Mr. Bounderby, the wealthy mill owner, epitomizes the self-made industrialist whose bombastic pride conceals a profound ignorance and insensitivity toward those beneath him. Bounderby's disdain for the "lower orders" and his relentless boasting about his rise from poverty expose the myths of industrial capitalism that justify social inequality and suppress empathy. Dickens critiques this worldview by juxtaposing Bounderby's callousness with the suffering and dignity of characters like Stephen and Sissy Jupe, who represent the human costs of economic progress.

The novel's utilitarian ideology, personified by Mr. Thomas Gradgrind, reflects the intellectual justification for the industrial system's harshness. Gradgrind's rigid emphasis on facts, statistics, and practicality reduces human beings to mere data points and stifles imagination and compassion. Dickens demonstrates through Gradgrind's eventual transformation that such a one-dimensional worldview is damaging and inadequate for addressing the complexities of human life. The limitations of utilitarianism are exposed in the emotional and moral failures of the characters who adhere strictly to its principles, especially Louisa Gradgrind, whose unhappy marriage and emotional repression serve as a critique of this philosophy.

Moreover, Dickens anticipates modern concerns about industrial capitalism-such as the loss of individuality, environmental degradation, and the widening gulf between wealth and poverty. The polluted, grim environment of Coketown mirrors the spiritual and social contamination that industrialization inflicts upon society. The repetitive imagery of "smokestacks" and "blackened walls" symbolizes not only physical pollution but also the corruption of human values and relationships. At the same time, *Hard Times* does not reject progress outright but calls for a more humane approach that balances industrial advancement with compassion, education, and social responsibility. Dickens advocates for the recognition of workers' humanity and the cultivation of imagination and kindness alongside factual knowledge. The novel's hopeful

conclusion, which suggests the possibility of reconciliation between classes and the restoration of human dignity, urges readers to envision an industrial society that serves the well-being of all its members. In sum, *Hard Times* offers a profound and prescient critique of industrialization, exposing its discontents while advocating for a more balanced and ethical vision of progress. Dickens' portrayal of the social and psychological impact of the Industrial Revolution remains relevant today, reminding us of the ongoing challenges posed by economic development and the necessity of preserving human values in the face of mechanization.

UTILITARIANISM AND THE EDUCATION OF FACT

Dickens's critique of utilitarian philosophy, especially its narrow focus on facts and neglect of imagination, is central to the novel's thematic framework. The character of Thomas Gradgrind, the strict proponent of factual education and rationalism, embodies the dangers of suppressing creativity and emotional development. Gradgrind's approach to schooling-"Fact, fact, fact!"-stifles the children's individuality and leads to psychological and moral consequences. Louisa Gradgrind's emotional desolation and Tom's moral decay illustrate the costs of a rigid, fact-based worldview. Dickens advocates instead for a more balanced education that nurtures imagination, empathy, and ethical understanding, suggesting that these qualities are essential for a humane society. The conflict between imagination and fact thus serves as a metaphor for broader social and ideological conflicts in Victorian England. One of the central themes in *Hard Times* is Dickens' sharp critique of the utilitarian philosophy that dominated Victorian society, especially in education and social policy. Utilitarianism, with its emphasis on "the greatest happiness for the greatest number," translated in the novel into an obsession with measurable facts, utility, and efficiency, often at the expense of emotion, imagination, and moral complexity. Dickens scrutinizes how this worldview reduces human beings to mere calculators of utility and drains life of its richness and unpredictability.

The character of Thomas Gradgrind is the embodiment of this rigid utilitarian mindset. As a schoolmaster and later a public official, Gradgrind insists on a strictly fact-based education, dismissing anything that cannot be quantified or logically proven. He instructs his pupils to reject fancy and imagination, believing that facts alone will prepare them for practical life. This educational model, Dickens argues, is dangerously reductive. By

focusing solely on facts, it neglects essential aspects of human development-creativity, empathy, and moral judgment-which are crucial for well-rounded individuals and a compassionate society. Dickens uses the children in the novel-Louisa and Tom Gradgrind-to illustrate the consequences of such an education. Raised to suppress their feelings and value only facts, they struggle with emotional repression and ethical confusion. Louisa's eventual unhappiness and emotional detachment reveal the failure of Gradgrind's philosophy to nurture her humanity. Tom's irresponsible behaviour and moral failings further demonstrate how an education devoid of empathy and imagination can produce individuals ill-equipped to navigate the complexities of real life. The novel also contrasts Gradgrind's fact-driven pedagogy with the more humane and imaginative approach represented by Sissy Jupe, the daughter of a circus performer. Sissy's background and outlook stand in direct opposition to Gradgrind's utilitarianism. She embodies compassion, flexibility, and creativity, qualities that the strict education system fails to recognize or cultivate. Through Sissy, Dickens advocates for an education that honours the whole person-one that encourages emotional intelligence alongside intellectual knowledge.

Moreover, the utilitarian emphasis on facts extends beyond education to shape the broader social order depicted in *Hard Times*. Industrialists like Mr. Bounderby echo Gradgrind's cold rationalism in their approach to workers and society-valuing people only as units of production or statistical data rather than as complex human beings. This philosophy justifies harsh economic and social policies that perpetuate inequality and suppress dissent. Dickens' critique is not merely of utilitarianism as a philosophical doctrine but of its mechanical application in institutions and public life. He warns against the dangers of over-reliance on logic and facts when detached from compassion and ethical consideration. The novel suggests that an education system-and by extension, a society-that privileges only facts and ignores the human spirit is doomed to produce suffering and alienation. By the end of the novel, Gradgrind himself recognizes the limitations of his approach, signalling Dickens' call for a more balanced worldview. This transformation is a plea for education and social structures that integrate facts with imagination, reason with feeling, and individual dignity with collective progress. In contemporary terms, Dickens' critique resonates with ongoing debates about education, emphasizing the importance of holistic learning that prepares individuals not only for the workforce but also for ethical citizenship and personal fulfilment.

CLASS CONFLICT AND SOCIAL INJUSTICE

Hard Times lays bare the stark class divisions and social injustices of the time. Dickens portrays the industrial elite, including Mr. Bounderby, as callous, self-important, and disconnected from the realities of working-class life. Bounderby's boastful narratives of self-made success mask his cruelty and ignorance toward his workers. In contrast, characters like Stephen Blackpool and Rachael embody working-class virtue and resilience, yet suffer from poverty, injustice, and social exclusion. The novel exposes the systemic inequalities perpetuated by industrial capitalism, where wealth and power are consolidated by a few at the expense of many. Dickens's sympathy lies with the oppressed, and he calls for social reform grounded in compassion and equity. *Hard Times* vividly portrays the stark divisions and tensions between social classes during the Industrial Revolution, exposing the systemic injustices that underpin Victorian society. Dickens uses the grim industrial town of Coketown as a microcosm of class struggle, where the working class suffers under the weight of exploitation, poverty, and social marginalization, while the wealthy factory owners maintain power through economic dominance and rigid social hierarchies.

At the heart of the novel's class conflict is the figure of Stephen Blackpool, a humble and honest factory worker who embodies the dignity and resilience of the working poor. Stephen's struggles illustrate the harsh realities faced by laborers: long hours, unsafe working conditions, and the lack of legal or social protections. His inability to rise above his class status, despite his integrity, underscores the rigidity of the social order and the barriers to social mobility. Dickens critiques not only the economic exploitation but also the moral failures of the upper classes, particularly those like Mr. Bounderby, the self-made factory owner who loudly boasts of his humble origins but lacks empathy for his workers. Bounderby's arrogance and hypocrisy highlight the complacency and cruelty often masked by rhetoric about self-help and meritocracy. He dismisses the poor as lazy or inferior, reinforcing class prejudices that justify unequal treatment. The novel also explores the alienation and dehumanization wrought by industrial capitalism. The factory system reduces workers to mere cogs in the machine, stripping them of individuality and subjecting them to monotonous, repetitive labor. This mechanization of human life fuels class resentment and social unrest, which Dickens hints at through the subplot involving the factory workers' strike. Although the strike is portrayed ambiguously, with characters like Stephen torn between solidarity and fear, it reveals the growing awareness and resistance among the working class.

Additionally, Dickens critiques the legal and social institutions that perpetuate injustice. The law is often indifferent or hostile to workers' rights, as seen in Stephen's struggles with an oppressive justice system and his inability to find support. Meanwhile, social conventions and education systems maintain the status quo by conditioning individuals to accept their place in the hierarchy. Importantly, Dickens does not paint the class conflict as a simple binary between good and evil but reveals the complexities and contradictions within all social strata. Louisa Gradgrind's emotional turmoil and moral confusion partly stem from her upbringing in a rigid, fact-driven middle-class environment, showing how class oppression can also harm the privileged by stifling their humanity. The novel ultimately calls for greater social awareness, compassion, and reform. Dickens advocates for a society where justice is not merely a matter of law or economic efficiency but includes dignity and care for all individuals, regardless of class. Through *Hard Times*, he exposes the moral cost of industrial progress when divorced from ethical responsibility and social empathy. In sum, *Hard Times* is a powerful critique of the class conflicts and social injustices fuelled by industrial capitalism, urging readers to recognize the humanity behind social divisions and to seek a more equitable and humane social order.

NARRATIVE STYLE AND SYMBOLISM

Dickens employs a blend of satire, realism, and allegory in *Hard Times* to convey his social critique. His vivid descriptions of Coketown, with its factories and grimy streets, create a tangible atmosphere of industrial bleakness. The recurring use of mechanical imagery-factories as machines, humans as parts-underscores the theme of dehumanization. Dickens's narrative voice is often ironic and humorous, softening the novel's grim subject matter while sharpening its critical edge. The characters' personal dramas are imbued with symbolic meaning; for example, Louisa's emotional repression symbolizes the consequences of an education devoid of imagination, while Sissy Jupe represents compassion and creativity. Through these devices, Dickens transforms a social protest into a compelling human story. Charles Dickens employs a distinctive narrative style in *Hard Times* that combines sharp social satire with vivid characterization and symbolic imagery to deepen the novel's themes and impact. The narrative voice in *Hard Times* is often ironic and didactic, guiding readers through the bleak realities of industrial society with a tone that blends humour, criticism, and moral urgency. Dickens frequently addresses the reader directly, breaking the fourth wall to comment on the absurdities

and cruelties of the world he depicts. This conversational style makes the novel feel immediate and engaged, inviting readers to question societal norms and the logic of utilitarian thinking.

Dickens' prose is marked by contrast-between stark, factual descriptions and moments of emotional intensity. For example, his depiction of Coketown's factories and streets uses repetitive, mechanical language to evoke the monotony and dehumanization of industrial life, while his portrayal of characters like Louisa and Sissy Jupe includes more lyrical and empathetic passages that emphasize the human spirit struggling against harsh conditions.

Symbolism plays a crucial role in reinforcing the novel's critique of industrial society and education. One of the most prominent symbols is the figure of Mr. Gradgrind himself, who represents the cold, rigid philosophy of utilitarianism and fact-based education. His name, with the word "grind," evokes the grinding down of imagination and emotion in favor of hard facts, symbolizing a mechanistic view of human beings that Dickens challenges throughout the novel.

Coketown itself is a powerful symbol of industrial blight and uniformity. Described with almost factory-like repetition-its "smokestacks," "blackness," and "monotony"-the town symbolizes the loss of individuality and natural beauty in the face of industrial progress. Its very landscape reflects the oppressive social order, with physical pollution mirroring moral and social corruption.

Water imagery, particularly the recurrent references to rivers and floods, symbolizes both destruction and renewal. The river that runs through Coketown, and the flooding events in the story, represent the uncontrollable forces of nature and emotion that disrupt the rigid structures imposed by society. This imagery suggests that human emotion and moral complexity cannot be contained by cold rationalism or social convention.

Characters themselves often embody symbolic roles. Sissy Jupe, with her background in the circus and her warm-hearted nature, symbolizes imagination, compassion, and the value of emotional education-qualities suppressed by the Gradgrind system but ultimately shown to be essential for a fulfilling life. In contrast, characters like Bounderby symbolize industrial arrogance and moral blindness. The narrative's structure also supports its symbolic meanings. The novel is divided into three books-"Sowing," "Reaping," and "Garnering"-drawing on the metaphor of agriculture to illustrate the consequences of societal actions and policies. This biblical and agrarian symbolism underscores

the moral lesson that the seeds one plants-whether of cruelty, ignorance, or kindness-will determine the harvest, or outcomes, for individuals and society. Finally, Dickens' use of humour and caricature adds layers of meaning. Exaggerated traits in characters like Bounderby serve as satirical tools to expose social follies and injustices, while moments of pathos balance the critique with human warmth, preventing the novel from becoming a mere polemic. In sum, Dickens' narrative style and symbolism in *Hard Times* work together to create a richly layered critique of industrial society, emphasizing the need for balance between fact and feeling, reason and imagination, and social order and human dignity.

CONCLUSION

Charles Dickens's *Hard Times* remains a seminal critique of the Industrial Revolution's social and moral fallout. Through its portrayal of Coketown's grim realities, its examination of utilitarianism's limitations, and its vivid character studies, the novel reveals the profound human costs of industrial progress and rigid rationalism. Dickens advocates for a more humane society that values imagination, empathy, and social justice. Over a century and a half later, *Hard Times* continues to resonate as a cautionary tale about the dangers of prioritizing economic efficiency over human dignity and the importance of balancing fact with feeling in education and society. The novel stands as a timeless call to recognize the full complexity of human needs amidst rapid social change.

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received MRMP training were significantly more likely to report positive experiences. Moreover, the impact was more pronounced in subjects such as science and language arts, which benefit heavily from multimedia-rich content.

CONCLUSION

Multimedia Resource Management (MRM) Programme has become an indispensable tool in modern education, significantly aiding school teachers in resource management and content delivery. While the advantages are evident, maximizing the effectiveness of MRMP requires addressing digital skill gaps and ensuring equitable access to necessary technology.

RECOMMENDATIONS

1. **Professional Development** : Schools should offer ongoing training tailored to different skill levels.
2. **Policy Support** : Educational policies should support the integration of MRMP with curricula and assessment.
3. **Technical Infrastructure** : Investment in robust digital infrastructure is essential.
4. **Teacher Involvement** : Involve teachers in the selection and evaluation of MRMP platforms to ensure relevance and usability.

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A STUDY ON LEADERSHIP BEHAVIOUR OF HIGH SCHOOL HEADS IN RELATION TO THEIR EMOTIONAL INTELLIGENCE

✉ Dr. Thrimurthy, Research Scholar, Department of Education, Davanagere University, Shivagangothri, Davangere - 577 007

✉ Dr. Venkatesha K., Professor, Department of Education, Davanagere University, Shivagangothri, Davangere - 577 007

INTRODUCTION

Education is an important factor in shaping the personality of an individual thought it. He learns the various role expectations and also the means and mechanisms of role fulfilment. In the complex social system, he occupies positions which have specialized functions, moreover, the functions associated with certain positions change over time, or they require new knowledge or skills to perform them in the changed contexts. An individual's personality has many different facts manifesting his different needs in order to develop adequate adjustments with reference to these from time to time, he has acquire new information, new skills or new thinking. This is possible if an efficient system of formal education is supplemented with an equally adequate and flexible system of non-formal education at all levels.

Education is considered to be synonymous with development. The veracity of this statement could be realized in importance attached to education in terms of the increased budget allocations made for it and thriving aspirations for education through the world. The progressive contribution of education to the quality of life of people and the progress of the nation is being realized in practically in all societies of the world. Education would become a critical and absolutely essential component of human life in future without any exception.

The success of any educational system depends on to a large extent on the characteristics and ability of the teacher or head of the institutions. The head of a school plays a pivotal role in the school activities and is referred to as the captain of a ship, who guides and directs it towards the destiny safely. The head of school plays an important role in he administrative sector of the school. He is supposed to be the person who manipulates and organizes programmes for the academic as well as the administrative aspect of the school.

Teachers form an important force in the development of society this is often reflected in the kinds of respect that

are paid to the teachers such as "teachers are nations builders" Teaching is one of the noble profession and so on. It is obvious that all teachers cannot claim to be worthy of these statements. It is only the effective teachers who can in some measure be worthy of the thrust that is placed on him by the society. Surely an efficient teacher can and does bring desirable changed in the student and deserves to be called nation builder.

In the words of Dugan (1960) the well being of the country depends on getting more and more better persons into teaching profession.

Ryans (1969) observes that it seems reasonable to assume the good teachers who are skill full in developing/ understanding of world, in which men likes is sight fully with respect to the ways and means of stimulating intellectual aptitudes and capable to patience understanding and sincere feeling for others may pave way for an enlightened and productive society.

IMPORTANCE OF HEAD MASTER IN SCHOOL

In education head master occupies an unique place and is the heart and soul of any educational institution. Good or bad school depends upon the head master. He should act as the leader of the team of teachers working with him seeking their co-operation and also giving full help to them as and when needed.

CONCEPT OF LEADERSHIP

Leadership has attracted the attention of sociologists social psychologist and political scientist in various contexts. No unanimity is however, found on the precise meaning of the term among the different social scientist. Accordingly, leadership to fair child has been defined as the act of organizing and directing the interests and activities of a group of persons as associated in same project or enterprise by a person who develops the cooperation through security and maintaining their more or less voluntary approval of the ends and methods proposed and adopted in their association. Bernard bass preferred to define leadership thus "Leadership is a kind of interaction

between or among people. Any attempt on the part of group members to change the behaviour of one or more member of a group is an attempt of leadership".

CHARACTERISTICS OF EDUCATIONAL LEADERSHIP

- Faith in and around conviction of the importance in a democratic society by the leader.
- Superior intellectual intelligence.
- High degree of emotional intelligence.
- Initiative resourcefulness and inventiveness.
- Cooperative attitude, a desire to develop power in others rather than to exercise power over them.
- Personnel activities.
- Drive the ability to work hard persistently towards desirable objectives.
- Physical and mental health rigour, stamina and emotional stability.
- High morale, character and personal integrity.
- Sound Judgement and commonsense.

CONCEPT OF EMOTIONAL INTELLIGENCE

The concept of emotional intelligence is an extension of the concept of social intelligence as proposed by Howard Gardner in his theory of multiple intelligence. Emotional intelligence can be defined as the ability to strike a balance between emotion and reason, being aware of one's own emotions, show empathy and compassion for others and have a high self esteem by understanding and managing the emotions of self and others.

An emotionally intelligent teacher is the heart and soul of a successful educational program. The teacher can be the most powerful force in modelling an emotionally intelligent behaviour and teaching how to control anger, resolve conflicts and motivate students. A teacher needs to act in an emotionally intelligent manner so that the students in term can imbibe these positive characteristics and can turn out to be productive and dutiful citizen of the nations.

Headmaster is first among the equals. A great headmaster makes great schools. Along with the design and execution of an intelligent curriculum, its effective implementation requires an emotionally intelligent leader. Thus in order to identify and develop such characteristics in our leaders.

NEED FOR THE STUDY

The head of a school that plays a pivotal role in the school activities is referred as a captain of a ship who guides and directs towards the destiny safely. The head of a school

plays an important role in all the activities of the school. He is supposed to be a person who manipulates and organizes programmes for the academic as well as administrative aspects of the school.

Thus we find that the headmaster holds the key position in the school. He is the director evaluator and above all the administrator of the whole school system. On the one hand he is to obey the education department the managing committee or the controlling authority and on the other hand he is to make others to obey him. He is the chief interlinking source between the school and the community. He succeeds in doing so by establishing good relationship with parents of the children the community in general and the different organization in general and the different organizations working in the community. The teaching staff, non-teaching staff, the learners, the parents are affected by his personality. So he should possess certain qualities of head and heart which might have positive influence on the developing personalities of others.

SCOPE OF THE STUDY

It was intended through the present investigation to study the leadership behaviour of high school heads in relation to their emotional intelligence. The variables of the study are leadership behaviour and emotional intelligence. Background variables included sex and school type.

OBJECTIVES OF THE STUDY

1. To find out the significant difference between the emotional intelligence of high school heads and their sex.
2. To find out the significant difference between the emotional intelligence of high school heads and their school type.
3. To find out the significant relationship between the leadership behaviour of high school heads and their emotional intelligence.

HYPOTHESIS OF THE STUDY

1. There is a significant difference in the emotional intelligence of high school male and female school heads.
2. There is a significant difference in the emotional intelligence of high school heads belonging to different type of management.
3. There is a significant relationship between leadership behaviour of high school heads and emotional intelligence.

VARIABLES OF THE STUDY

1. Dependent variable: Leadership behaviour.
2. Independent variable: Emotional intelligence.
3. Moderate variable: Sex, School type

SAMPLE FOR THE STUDY

For the experimental design, the researcher selected stratified random sample of 102 school heads working in high schools of Mysore District, giving representation to different background variables. Out of 102 school heads 77 males and 25 females were taken for the study.

TOOLS USED IN THE STUDY

There were two types of tools that were used by the researcher to carry out the present investigation they were.

1. Dr.Asha Hingar's leadership behaviour scale to measure the leadership of high school heads.
2. Dr.Shubhra Mangal's teachers emotional intelligence inventory to measure the emotional intelligence of high school heads.

STATISTICAL TECHNIQUES OF THE STUDY

The collected data was scored and tabulated for the purpose of analysis. The following statistical techniques are used.

1. Mean and Standard Deviation.
2. 't' test analysis
3. Co-efficient of Correlation.

ANALYSIS AND INTERPRETATION OF THE DATA

ANALYSIS AND INTERPRETATION OF OBJECTIVE ONE

The first objective was to find out the significant difference between the emotional intelligence of high school heads and their sex.

HYPOTHESIS ONE

H1: There is a significant difference in the emotional intelligence of high school Male and Female school heads.

In order to test the above hypothesis it was changed into null hypothesis.

H0 : There is no significant difference in the emotional intelligence of high school Male and Female school heads.

From the above table, it can be seen that the obtained 't' value of 5.94 is higher than the table value of 1.98 at 0.05 level. Hence, the null hypothesis is rejected and in

Table-1: Showing the Number, Mean, Standard Deviation, 't' value and level of significance between male and female school heads emotional intelligence.

Variable	Gender	N	M	SD	't' value	Level of Significance
Sex	Male	77	875.2	491.29	5.94	Significant at 0.05. level
	Female	25	908.8	642.56		

its place an alternative hypothesis accepted i.e., there is a significance difference in the emotional intelligence of high school male and female school heads.

ANALYSIS AND INTERPRETATION OF OBJECTIVE TWO

The second objective was to find out the significant difference between the emotional intelligence of high school heads and their school type.

HYPOTHESIS TWO

H2: There is a significant difference in the emotional intelligence of high school heads belonging to Government and Aided school heads.

In order to test the above hypothesis it was changed into null hypothesis.

H0 : There is no significant difference in the emotional intelligence of high school heads belonging to Government and Aided school heads.

Table-2 : Showing the Number, Mean, Standard Deviation, 't' value and level of significance between government and aided school heads.

Variable	Gender	N	M	SD	't' value	Level of Significance
School Type	Government	34	882.9	420.76	0.84	Not Significant at 0.05. level
	Aided	34	878.2	638.06		

From the above table, it can be seen that the obtained 't' value of 0.84 is less than the table value of 2.00 at 0.05 level. Hence, the null hypothesis is accepted i.e., there is no significance difference in the emotional intelligence of high school heads belonging to government and aided school.

HYPOTHESIS 2.1

H2.1 : There is a significance difference in the emotional intelligence of high school heads belonging to Government and Unaided school heads.

In order to test the above hypothesis it was changed into null hypothesis.

H2.0 : There is no significance difference in the emotional intelligence of high school heads belonging to Government and Unaided school heads.

Table-3 : Showing the Number, Mean, Standard Deviation, 't' value and level of significance between government and unaided school heads.

Variable	Gender	N	M	SD	't' value	Level of Significance
School Type	Government	34	878.2	638.06	0.58	Not Significant at 0.05. level
	Unaided	34	886.7	1055.7		

From the above table, it can be seen that the obtained 't' value of 0.58 is less than the table value of 2.00 at 0.05 level. Hence, the null hypothesis is accepted i.e., There is no significance difference in the emotional intelligence of high school heads belonging to government and unaided school heads.

ANALYSIS AND INTERPRETATION OF OBJECTIVE THREE

The third objective was to find out the significant relationship between the leadership behaviour of high school heads and their emotional intelligence.

HYPOTHESIS THREEH

H2.1: There is

H3 : There is a significant relationship between leadership behaviour of high school heads and emotional intelligence.

In order to test the above hypothesis it was changed into null hypothesis.

H0 : There is no significant relationship between leadership behaviour of high school heads and emotional intelligence.

Table-4 : Showing the Number, Mean, df, 'r' value and co-efficient of correlation between the emotional intelligence and leadership behaviour of high school heads.

Variable	N	Df (N-2)	Mean	'r' value	Co-efficient of Correlation
Leadership Behaviour	102	100	126.7	0.99	High
Emotional Intelligence			882.4		

From the above table, it can be seen that the obtained value of 0.99 shows that there is a high correlation between emotional intelligence and leadership behaviour. Hence, the null hypothesis is rejected and in its place an alternative hypothesis is accepted i.e., there is a significant relationship between leadership behaviour of high school heads and their emotional intelligence.

MAJOR FINDINGS OF THE STUDY

1. There is a significant difference in the emotional

intelligence of high school Male and Female school heads. ('t' value 5.94).

2. There is no significant difference in the emotional intelligence of high school heads belonging to Government and Aided school ('t' value 0.84).
3. There is no significant difference in the emotional intelligence of high school heads belonging to Government and Unaided school ('t' value 0.58).
4. There is a significant relationship between leadership behaviour of high school heads and their emotional intelligence ('r' value 0.99).

EDUCATIONAL IMPLICATIONS

- It is found that the emotional intelligent levels of high school head masters and their leadership behaviour is significantly related.
- So we came to conclusion that those who have emotionally more intelligent they will be a good leader.
- Therefore the institutions, government must provide proper in service training and conduct leadership enhancing programmes for high school heads.
- The investigation shows that female heads have emotionally more intelligent than male heads.
- It is necessary to give proper guidance to male heads for controlling their emotions and understand the other feelings.

LIMITATIONS OF THE STUDY

- This study confines with heads only of high school. It has not considered the college principals and school teachers.
- The psychological and professional background variables that are considered for the study does not include all the variables that influence the emotional intelligence of high school heads.
- The study confines only to the sample drawn from Mysore District.

SUGGESTIONS FOR FURTHER RESEARCH

1. Studies on the emotional intelligence of elementary and secondary school teachers as they are correlated with professional background could be conducted.
2. A similar study can be conducted in other districts of Karnataka as this present study is conducted in Mysore District.
3. Studies on emotional intelligence of college principals/teachers can be conducted.

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IMPACT OF THE INSTRUCTIONAL INTERACTIVE COMPETENCY (IIC)- SKILL OF ENGAGEMENT ON STUDENT-TEACHERS

✉ Smt. Geeta Konnur, Research Scholar, Department of Education, Karnataka State Akkamahadevi Women University, Vijayapura, Karnataka, India.

✉ Prof. U. K. Kulkarni, Professor, Department of Education, Karnataka State Akkamahadevi Women University, Vijayapura, Karnataka, India.

ABSTRACT

Microteaching is a teacher training technique that allows educators to practice and refine specific teaching skills in a controlled environment. In the follow up programmes for microteaching, researcher evolved Instructional Interactive Competencies (IIC) for Teaching in tune with constructivism. The present study focusses on the development of new skill i.e. skill of engagement and its impact on student- teachers' performance in microteaching. In this study researcher adopted a mixed-method design and by purposive sampling technique 60 student-teachers were selected. Findings reveal significant improvements in lesson clarity, student engagement, and overall teaching performance, underscoring the importance of mastering this foundational engagement skill.

Key terms : Microteaching, Instructional Interactive Competencies, skill of engagement

INTRODUCTION

In present context, teachers viz., both in-service and pre-service teachers are using constructive approach specifically 5E model lessons in routine. But there we find little mismatch in skill/competencies of what they learnt and practice.

The 5E instructional model was not only unfamiliar and difficult to implement for the pre-service teachers, but also implementing required effort and time. The challenges faced by the pre-service teachers in implementing the 5E instructional model are specifically applicable to each phase of the 5E model.

During the engagement phase of the 5E instructional model, pre-service teachers were challenged to find appropriate activities that would determine what students know or think about the topic (Demirbas & Pektas, 2015; Iscan et al., 2015; Metin & Ozmen, 2009; Namdar & Kucuk, 2018; Yildiz & Kocak Usluel, 2016). Similarly with all other E's also.

Taking into consideration the viewpoints by the previous research studies, it was highly desired to work on the follow up programmes for microteaching, which can provide a sound basis for transfer of skills from simulated training situation to real class rooms and to address training packages for constructivism that is 5E Model. Hence there is need to revisit the Microteaching as in terms Instructional Interactive Competencies (IIC) for Teaching in tune with constructivism.

STATEMENT OF THE PROBLEM

The Researcher undertaken the study "Impact of the Instructional Interactive Competency (IIC) - Skill of Engagement in Microteaching practice on student-teachers"

OBJECTIVES OF THE STUDY

The following objectives are framed for the present study;

1. Development of skill of engagement
2. Internal validation of the developed skill of engagement
3. External validation of skill of engagement (experimental try-out)
4. To study the impact of skill of engagement on student teacher performance

HYPOTHESES OF THE STUDY

The following research hypotheses are framed for the present study;

1. There is no significance of difference between pre-test scores of control group and experimental group.
2. There is no significance of difference between post-test scores of control group and experimental group.

OPERATIONAL DEFINITION OF TERMS USED

1. **Instructional Interactive Competencies (IIC) :** IIC is a package developed by the researcher on all the five teaching competencies i.e. cognitive, performance, consequence, affective and

exploratory competencies to enhance teaching competencies of secondary student teachers.

- 2. Skill of engagement :** This is the Instructional Interactive Competency (IIC) in tune with constructivism. Which involves various styles of engaging, strategies for engaging students, linking new content to prior knowledge, and setting clear objectives.

VARIABLES OF THE STUDY

The following variables were considered for the present study;

Nature of the Variable	Variable Considered
Independent Variable	Skill of engagement
Dependent Variables	Student teacher performance

LIMITATIONS OF THE STUDY

This study was conducted with the B.Ed student teachers from Vijayapura district TEI only.

LITERATURE REVIEW

REVIEWS RELATED TO MICRO TEACHING

Allen (1969) reports during first year at Stanford students trained with microteaching required 10 hours of instruction per week to reach a certain level of competence, whereas conventional practices needed 25 hours per week - to reach the same standard competence.

Bhattacharya (1975) conducted a study to find the feasibility of the use of audio tape a recording device for obtaining feedback. It was found that audio tape helps in producing indirectness skills and development of attitude towards microteaching.

REVIEWS RELATED TO CBT

Al- Ajloni (2006) conducted a study that was aimed at constructing a training program for developing vocational competencies for trainers of vocational Training Corporation. The results revealed that the training program was high 4.62 out of 5, and it could be adopted according to the specialist's perspectives as a training program for vocational trainers in Jordan.

REVIEWS RELATED TO 5E

Demirbas & Pektas, (2015); Iscan et al., (2015); Metin & Ozmen, (2009); Namdar & Kucuk, (2018); Yildiz & Kocak Usluel, (2016) these studies reported that During the engagement phase of the 5E instructional model, pre-service teachers were challenged to find appropriate

activities that would determine what students know or think about the topic.

Duran et al., (2004); Enugu & Hokayem, (2017) noted having more time to practice and plan the 5E lesson plan as possible solutions.

Duran et al., 2004; Enugu & Hokayem, 2017; Fletcher & Luft, 2011; Varma et al., 2009 these four studies reported that the pre-service teachers had a hard time applying theory to practice.

RESEARCH METHODOLOGY

In this study the Mixed-method research methodology was adopted. Which involves The New Product Development (NPD) design and quasi-experimental design. This process is as follows;

PHASE -1: DEVELOPMENT OF SKILL OF ENGAGEMENT

In this phase, the researcher developed the skill of engagement. Which includes manual, components, demo video, checklist and observation schedule.

PHASE - 2 : INTERNAL VALIDATION OF SKILL OF ENGAGEMENT (PILOTING)

During this second phase, the researcher consulted educational experts, teacher educators, in-service teachers' and student-teachers for internal validation of the developed material. Their suggestions were taken modified accordingly and final skill is ready for experiment.

PHASE -3 : EXTERNAL VALIDATION OF SKILL OF ENGAGEMENT (EXPERIMENTAL TRY-OUT)

In this Phase, the researcher conducted external validity with experimental try-out as follows;

SAMPLE

By purposive sampling technique, two teacher educators with 60 student-teachers were selected as sample from Sri. Padmaraj College of Education, Shindagi, Vijayapura for the present study.

EXPERIMENTATION

Parallel group design was used for the smooth conduct of experiment, a teacher education institution with student-teacher as sample units.

Experimental Group (30)	Control Group (30)
Pre-test	Pre-test
Treatment-Practice (Skill of Engagement)	Treatment-Practice (Skill of introducing lesson)
Post-test	Post-test

- Here, both groups were assessed on their teaching performance before and after receiving training on the skill of engagement and Introduction Skill respectively.
- The experimental group received a training focusing on skill of engagement, which includes effective engagement techniques, styles, strategies for engaging students, linking new content to prior knowledge, and setting clear objectives.
- The control group received traditional Introduction Skill training and practice.

Data Collection : Teaching performances were evaluated using a standardized rubric assessing clarity, engagement, and organization. Additionally, student feedback was collected to gauge engagement levels.

DATA ANALYSIS

1. HYPOTHESIS

The following null hypothesis was set up by the researcher.

H01: There is no significance of difference between the mean pre-test scores of control group and experimental group.

Table-1 : Mean, SD and 't' value of pre-test scores

Groups	N	Mean	SD	't' value	LOS at 0.05
Experimental group	30	211.15	20.23	0.51	NS**
Control group	30	207.80	21.0		

** Not Significant

INTERPRETATION

By referring to above table it is found that 't' value is 0.51 the corresponding table value is 1.97 (df38 and 0.05 level). The obtained 't' value is smaller than the corresponding table value. Hence, null hypothesis (H01) is accepted and the research hypothesis is rejected.

CONCLUSION

This means that, there is no significance of difference between the mean pre-test scores of control group and experimental group.

2. HYPOTHESIS

The following null hypothesis was set up by the researcher;

H02: There is no significance of difference between post-test scores of control group and experimental group.

INTERPRETATION

The above table reveals that, computed 't' value is

Table-2 : Mean, SD and 't' value of post-test scores

Groups	N	Mean	SD	't' value	LOS at 0.05
Experimental group	30	52.625	2.425	12.288	S*
Control group	30	41.55	5.159		

* Significant

12.28 and the corresponding table value is 1.97 (df 78 at 0.05 level). The obtained 't' value is greater than the corresponding table value. Hence, null hypothesis (H02) is rejected and the research hypothesis is accepted.

FINDING

This means that, there is a significance of difference between scores of Post-tests for the control group and experimental group. Hence, the experimental treatment is more effective.

So that, skill of engagement is more effective than the traditional skill of introducing a lesson.

RESULTS

- Post-test analyses revealed significant improvements in the experimental group compared to the control group. That is Skill of engagement is more effective than the traditional skill of introducing a lesson.
- The experimental group demonstrated enhanced clarity in presenting lesson objectives, increased student participation, and more effective use of time during engagement phase.
- Student feedback indicated higher levels and styles of engagement created more interest in the experimental group.

DISCUSSION

The findings suggest that training pre-service teachers in the engagement skill can lead to more effective teaching practices. By mastering the art of engaging, teachers can create a joyful and engaging learning environment that fosters student engagement and facilitates better understanding of the content.

These results align with the theoretical framework of microteaching, which posits that focused practice on specific teaching skills can lead to overall improvements in teaching effectiveness.

CONCLUSION

This study underscores the significance of the Engagement Skill in microteaching and its impact on teaching performance. By incorporating training on effective Instructional Interactive Competencies (IIC) in light

of constructivism, into teacher education programs, student-teachers can enhance their mastery in the teaching skills/competencies. This indeed help them to create successful learning experiences.

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- From Continued on Page No. 19

- The emotional intelligence of heads/teachers in Karnataka can be studied in relation to certain social, psychological and organizational variables like socio-economic status, organizational climate, size of the school, etc.
- A study of emotional intelligence of only female heads/teachers can be studied in relation to their professional background variables.

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PERFORMANCE EVALUATION OF DATA HANDLING ALGORITHMS (SVM, DT, RF AND LR) FOR THE HEALTHCARE SYSTEM FOR THE ACCURACY PREDICTION OF DIABETES UNDER ANOMALY DETECTION IN HEALTH DATA SCIENCE (HDS)

✉ Vinay Bhatt, Research Scholar, Department of Computer Science and Engineering, Asian International University, Imphal West, Manipur, India

✉ Dr. Mayank Kumar, Associate Professor, Department of Computer Science and Engineering, Asian International University, Imphal West, Manipur, India

ABSTRACT

In present time, diabetes is an ongoing health problem that has the possibility to create a global medical issue. Diabetes is a health disease that results from excessive glucose levels in the blood. The International Diabetes Federation estimates that 382 thousand individuals worldwide have diabetes. Diabetes is a major reason for lack of vision, kidney damage, loss of limbs heart disease, as well as brain. In this research paper, to predict the data of diabetes disease, machine learning algorithms like support vector machine (SVM), decision tree (DT), random forest (RF) and logistic regression (LR) have been used to assess the accuracy which is under anomaly detection. The process of finding and extracting nonstandard features of data is called anomaly detection. Machine learning (ML) algorithms are used to handle data in data science (DS); hence, if they are implemented in a healthcare system, the system is known as health data science (HDS), and the algorithms applied are known as data handling algorithms. In this paper, nine attributes were used to predict diabetes, and their accuracy determined using a python programming tool. As a result of all of this effort, the decision tree (DT) method has the highest testing and training accuracy, whereas the SVM algorithm has the lowest training and testing accuracy. In the presented work, only four algorithms based on machine learning used to predict diabetes, which is insufficient; thus, in the future, other machine learning algorithms can be utilized to improve accuracy in other scenarios of diabetes prediction. The accuracy proved more accurate than expected.

Keywords: Health Data Science (HDS), Diabetes Prediction, Machine Learning (ML), Data Handling Algorithms, Support Vector Machine (SVM), Logistic Regression (LR), Decision Tree (DT), Random Forest (RF), Accuracy

1. INTRODUCTION

Finding anomalies is a significant problem that has been researched for millennia. For various applications, a wide range of unique techniques have been created and applied to anomaly detection [26]. "The problem of finding patterns in data that do not conform to expected behavior" is known as anomaly detection [1]. Because unprotected data could contain important, crucial, and useful information, it is crucial to identify abnormalities in a variety of application domains. The main goal of this paper is to perform a thorough evaluation that reflects an extensive investigation of machine learning methods for anomaly identification. The usage of machine learning (ML) algorithms as a means of anomaly detection is growing. To "automate the process of knowledge acquisition" is the goal of machine learning (ML) [26]. Using this method, a model that can differentiate between normal and abnormal classes is constructed [2]. The accuracy of diabetes prediction under anomaly detection is measured using supervised learning techniques in this research work. Type 1, type 2, and gestational diabetes are the three categories

of diabetes [3][4]. Type 2 diabetes has been included in this work as a predictor of accuracy.

One aspect of health data science (HDS) that can be applied to data processing is machine learning. In this study, we will choose the diabetic disease within the healthcare system and use the machine learning algorithms idea to test the accuracy of our predictions, showing in figure 1.

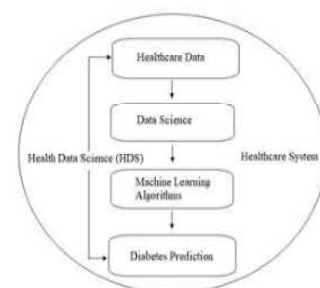


Figure 1. Diabetic prediction under healthcare system

We will also determine which algorithm is more accurate at predicting the condition. The algorithms of machine learning techniques that we will use for analysis in this paper will be called data handling algorithms. These algorithms are in a way machine learning algorithms

because only four algorithms of machine learning have been selected to handle the data.

1.1. BACKGROUND INFORMATION

Data science has been instrumental in delivering essential information sources that have benefited IT industries, healthcare sector, corporate establishments, and other research groups [5][39]. Use methods from data science in the healthcare sector in this research work, which is why "health data science" (HDS) is proposed. The issue of healthcare data analysis and prediction in the healthcare system for various diseases is solved by health data science (HDS). It has helped with drug discovery, genetic disease research, and other areas [40]. In this study, we focus on the accuracy prediction of diabetes in health data science within the context of the healthcare system. An excessive amount of glucose in the body might lead to the development of diabetes [6]. Diabetes should not be ignored because, if unchecked, it can cause major difficulties for a person, such as harm to the kidneys, heart, eyes, blood pressure, and other organs [7][8]. Type 1, Type 2, and gestational diabetes are the three forms of diabetes that are most common in the healthcare system.

- **Type 1 Diabetes :** With type 1 diabetes, there is insufficient insulin production by the cells and a weakened immune system [9]. The currently no effective preventative does not measure for type 1 diabetes, nor are there compelling researches that support its etiology [41].
- **Type 2 Diabetes :** The most prevalent kind of diabetes, known as type 2, is a condition brought on by too elevated blood glucose, or blood sugar [10]. Your primary energy source, blood glucose, is mostly derived from the food you eat [11] [42].

Gestational Diabetes : One kind of diabetes that only manifests during pregnancy is called gestational diabetes. Diabetes during pregnancy can harm the mother's health as well as the unborn child's [12][13]. Taking care of your diabetes can help keep you and your child safe.

In order to determine accuracy, the problem of diabetes prediction employing data handling methods-that is, machine learning techniques in the HDS-is chosen for this work. Machine learning offers a wide range of algorithms that, when combined with statistical analysis and input data, may anticipate outcomes with a higher degree of accuracy [45]. The four main categories of machine learning algorithms are reinforcement learning, unsupervised learning, supervised learning, and deep learning [43][44]. In this article, we compare the accuracy

of diabetes prediction using four supervised learning algorithms: SVM, logistic regression, decision trees and random forest the algorithms are referred to as data handling algorithms. A set of labeled data, or input data associated with the intended output, is used to train the machine in supervised learning. There are data handling algorithms which are used for accuracy prediction of diabetes in this research paper as:

Support Vector Machine (SVM) : Strong machine learning algorithms like Support Vector Machine (SVM) are utilized for tasks including regression, outlier identification, and linear or nonlinear classification [14][15]. The SVM algorithm's primary goal is to locate the best hyperplane in an N-dimensional space that may be used to divide data points into various feature space classes [16][17]. The hyperplane attempts to maintain the largest possible buffer between the nearest points of various classes [18].

Logistic Regression (LR) : A procedure used in statistics to examine the relationship between two data components is called logistic regression [19]. When doing binary classification using logistic regression, the sigmoid function-which accepts inputs as independent variables and outputs a probability value between 0 and 1-is used.

Decision Tree (DT) : In machine learning, a decision tree is a flexible, comprehensible approach for predictive modeling [20]. It is appropriate for both regression and classification tasks since it organizes decisions according to input data [21]. The structure resembles a tree, with every internal node testing a feature, every branch denoting an attribute's value, and every node in the leaf representing the prediction or conclusion [22][23].

Random Forest (RF) : An efficient tree learning method in machine learning is the random forest algorithm [24]. To measure a random subset of attributes for every partition, a random subset of the data set is used to build each tree [25]. Because each tree is more variable as a result of the randomization, there is less chance of excessive fitting and average accuracy in predictions is enhanced [26].

1.2. RESEARCH PROBLEM

The primary issue with this research work is the challenging handling of data collection and its partial non-patternization. The largest issue with using data from several sources for diabetes prediction analysis is that it might be challenging to identify which data has the highest accuracy. For this reason, we need to collect diabetes data from various sources. Instead, it should come from a single source, and the accuracy of the data should be determined

using algorithms. Due to varying patterns of data and improper accuracy prediction, handling of data is an essential problem with this study.

PROPOSED WORK

The study challenge states that because the diabetes data do not follow a complete pattern like detect to anomalies, it is not possible to fully forecast the correctness of the data, so it is not evaluated. Furthermore, we have no idea which machine learning method will work best for examining data related to diabetes. As a result, our next purpose will be to preprocess and evaluate diabetic data using four machine learning algorithms using data from a single source.

The propose work in this research article is to take diabetic data and its features from a single source and train, test, and analyze them using four machine learning algorithms: LR, SVM, DT, and RF, in that order. Following analysis, the system will forecast the accuracy of diabetes. Research indicates that the most accurate algorithm will be the best algorithm.

The figure 2 below illustrates the research phase and how the complete research analysis process will work. Initially, nine features related to diabetes will be chosen from a single source from which diabetes data will be gathered. Next, in a process known as data preparation, the data will be cleansed based on present and absent details of diabetes. Subsequently, we will employ data processing algorithms to analyze the data in accordance with each algorithm. Following data analysis, a prediction will be made regarding the performance outcome of each suggested algorithm, indicating which one has a higher accuracy for diabetic prediction. The most accurate algorithm will be deemed as the best algorithm.

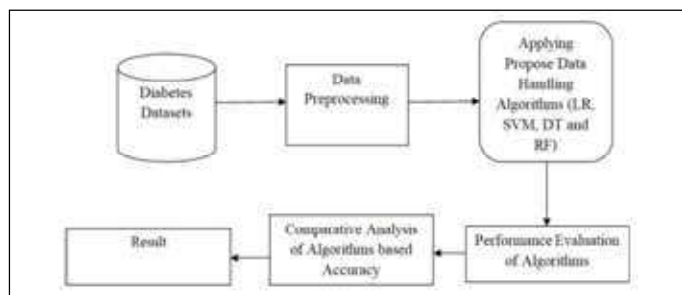


Figure 2. Phases of propose research process

2. LITERATURE REVIEW

The reviews that follow illustrate previous research on machine learning algorithms that processing data on diabetes-based samples and studies:

Ali M. S. et al. (2023), propose a technique to address the problem of incorrect- accurate findings in diabetes

detection by assembling an extensive set of data of patients, both diabetic and non-diabetic, utilizing the algorithm known as random forest with its optimal parameters. Because of the artificial nature of the study and the controlled conditions, the findings may not be applicable in real-world scenarios. Future research should focus on increasing the attributes and sample count from the unbalanced and balanced datasets. This will allow for a more thorough understanding of the factors that contribute to the model's ability to accurately recognize people with diabetes [1].

Jibril A. U. et al. (2023), suggest the use of algorithms trained with machine learning to the diagnosis of chronic diseases, like the prediction of diabetes. It also improves the effectiveness during the predictive models applied to perform this prediction by using a particle-swarm optimization approach to optimize the algorithms and produce an optimal contemporary model that has a higher accuracy rate and less undesirable incorrect predictions. A different technique or dataset outside those listed previous fall entirely outside of the reach the current investigation and may be utilized to perform further studies that would further expand its boundaries [2].

Peerbasha S. et al. (2023), suggested a sophisticated structure for managing data that can determine if somebody suffers polygenic diseases or not. This research employed established classification techniques, including the decision tree (DT), random forest (RF), support vector machine (SVM), logistic Regression (LR), and K-Nearest Neighbors (K-NN), to forecast the impact for Type-II patients with diabetes. The outcome of employing these methods shows that both the DT and RF classifiers outperform the other classifiers in this research's attempt to predict diabetes [3].

Chou C. Y., Hsu, D. Y., & Chou, C. H. (2023), eight criteria were suggested for data preprocessing: age, BMI, diabetes pedigree function, sebum thickness, insulin level, number of pregnancies, and diastolic blood pressure. The outcome made the current diabetes methods for predicting better. In the future, it will be valuable to investigate and suggest models utilizing deep learning and unsupervised machine learning methods [4].

Sarkar P.J. & Pawar S. (2023), suggested using five machine learning techniques- XGB-h, CGB, ANN, LGBM and XGBoost XGB -as well using the NHANES sample for predicting diabetes mellitus. Regarding AUC and accuracy, the investigation's findings show where the XGB-h algorithm performs better than alternative ML techniques. Data is kept in the data center for future use by the algorithm that stores the computational models [5].

Kangra K. & Singh J. (2023), suggested using the machine learning algorithms for prediction RF, NB, SVM, KNN, LR and DT to help forecast diabetes. The algorithms for prediction and ongoing diabetes research were taken into consideration when selecting them. The study's result suggests LR performs better for ROC area and SVM outperforms the PIDD as far as in accuracy. Therefore, within a short while, conduct experiments using hybrid algorithms and evaluate their efficacy using both these sets of data and certain actual time datasets [6].

Kulkarni A.R. et al. (2023), proposed a study that would employ an ML-driven method to analyze an ECG and identify signs of pre-diabetes as well as mellitus on a frequency of simply one heartbeat. For diabetes, the suggested approach performed exceptionally well throughout the unsupervised test set and the confirmation set. However, thorough validation using outside distinct samples is required before implementing this technique in everyday operations [7].

Febrian M.E. et al. (2023), suggested utilizing ML methods as supervised to compare two NB and KNN for predicting diabetic based medical indicators in the collected data. Consequently, that is often said that when utilizing the PI sample to forecast diabetes, the NB method performs better than the KNN technique. To provide a value for accuracy and greater precision, additional algorithms, such as NN and additional approaches may be included during further studies [8].

Wang S. et al. (2023), presented an investigation comparing the predictive outcomes of different T2DM risk-predicting models, including BP NN, SVM, DNN, LR, CART, and C4.5. The highest predicting result can be seen by the findings, which suggested the BP NN was the most accurate system utilized the chosen set of data. Nevertheless, this approach is prone to producing allocation marginalization issue and can't solve the sharing of data issues such as imbalanced sample [9].

Chu S. et al. (2023), according to the proposed seven machine learning algorithms, the study's participants with Type 2 diabetes had their risk of injuries predicted. They either have less danger variables than typical fracture predicting methods, or they haven't been tested in diabetic populations either. In this work, ML algorithms decreased the 37 original risk variables to 17 variables associated with risk [10].

Asli G. Ö. D. E. & Kalkan A. (2023), aims to investigate the relationship between various machine learning approaches, data on diabetes ability to detect identification of diabetes in female patients with the disease, and the

method of machine learning efficiency comparison. The main objective of this research is to use several classification algorithms based on machine learning to identify diabetes at an early stage. In terms of accuracy, precision, AUC values and F1-score, the RF model performed best. Future research in this area may yield better outcomes by utilizing a greater number of ML algorithms [11].

3. RESEARCH METHODOLOGY

In this section, the methods used in research, design of research, algorithms used, related data used, parameters related to assessment, tools used and techniques for analyzing data are discussed.

3.1. RESEARCH DESIGN

The precision of the diabetes prediction determines how this entire study is designed. This study work's design approach, which goes like this, explains how our system will function:

- Step1 :** Install the required libraries and the diabetes dataset.
- Step 2 :** Preprocess the data to remove any missing information.
- Step 3 :** Apply the dataset to generate the test and training sets.
- Step 4 :** Select a machine learning algorithm to the set, which consists of Random Forest, Decision Tree, Support Vector Machine, and Logistic Regression.
- Step 5 :** Using the training set for the machine learning technique, create the classifier model.
- Step 6 :** To assess the Classifier model using the specified machine learning algorithm, use the test set.
- Step 7 :** Compare and evaluate the experimental performance results of each classifier.
- Step 8 :** After examination, choose the method that performs the best based on accuracy.

3.2. PROPOSED ALGORITHMS

Four data handling algorithms-SVM, LR, DT, and RF-will be used in this study; the specifics are provided in the background information. As a result, we will now describe how to use the various suggested data processing strategies in this study.

i. SVM Algorithm : This algorithm will be applied in this study in the following manner:

- Step 1 :** Choose the hyper plane that best divides the class.
- Step 2 :** The distance, or margin, between the planes and

the data must be determined in order to determine which hyper plane is superior.

Step 3: Miss Conception is more likely when there is less distance between the classes, and vice versa. Thus, we must

Step 4: Choose the class with the highest margin. Distance to a positive point plus Distance to a negative point equals the margin.

ii. L. R. Algorithm : This research can make use of a method based on logistic regression (LR).

Step 1 : Sort the data into binary categories, such as 0 or 1, in order to identify patients who are either positive or negative for diabetes.

Step 2 : Identify the best fit that explains the relationship between the predictor and target variables.

Step 3 : It is possible to predict the probability of both positive and negative outcomes using the sigmoid function.

iii. DT Algorithm : The following procedures will be taken in order to implement the decision tree classification algorithm.

Step 1 : As an input feature, create a tree using nodes.

Step 2 : Choose a feature whose information gain is highest in order to forecast the output from the input feature.

Step 3 : For every attribute in every tree node, the maximum information gain is computed.

Step 4 : To create a sub tree with the feature not utilized in the node above, repeat step 2 again.

iv. RF Algorithm : Using the subsequent steps, this approach reduces variance to improve decision tree performance.

Step 1 : Choosing the "R" features from the total features ("m") where $R < M$ is the first stage.

Step 2 : The node that uses the optimal split point from the "R" features.

Step 3 : Using the optimal split, divide the node into sub-nodes.

Step 4 : Steps 1 to 3 should be repeated until the desired number of nodes is obtained.

Step 5 : In order to build "n" number of trees, a forest is built by repeatedly doing steps 1 to 4.

3.3. DATA COLLECTION METHODS

The UCI repository known as PIDD Dataset is where the diabetes data was collected [33]. There are 2000 patient attributes or features in the dataset. Each data point's class

variable is the ninth attribute. Diabetics can see the results 0 or 1, indicating a positive or negative outcome, in this class variable. The features of diabetes that are used to analyze algorithms and determine accuracy are displayed in Table 1.

Sl.No.	Diabetic Attributes	Normal Intervals
1	Pregnancies	Y or N
2	Glucose	70 Mg/dL
3	Blood Pressure	Less than 120/80 mmHg
4	Skin Thickness	2 mm
5	Insulin	< 25 mIU/L
6	BMI	18.5 to 24.9
7	Diabetes Pedigree Function	0.08 to 2.42
8	Age	20-90
9	Outcome	1 (Y) or 0 (N)

SAMPLE SELECTION

There are numerous features of 2000 patients in the sample. This model for diabetes prediction is based on a little unbalanced dataset, with 900 categories identified as positive, meaning they have diabetes, and about 1100 categories categorized as negative, meaning they do not have diabetes, showing in fig.3.

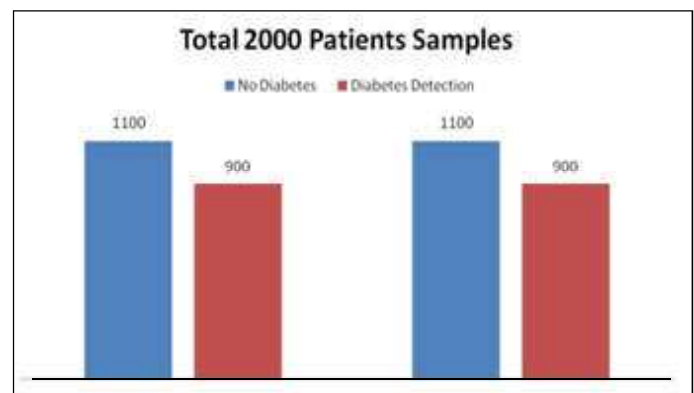


Figure 3. Patients with and without diabetes

3.5. DATA ANALYSIS TECHNIQUES

It is the one observational point that is cut off from all others. An outlier's precise source can be either experimental mistake or observational error. Outliers can be divided into two categories as univariate and multivariate. Univariate outliers are defined as features observed in a single dimension, and multivariate outliers are defined as features observed in n-dimensional space [27][28]. The histogram plot in this data analysis represents a univariate, while the correlation matrix plot represents a multivariate outlier [29][30].

3.6. ANALYTICAL TOOLS

Python's pandas tool is used in this work to analyze data. Mathematical operations are performed with NumPy and data visualization is handled by matplotlib [31][32], two essential Python libraries upon which Pandas is based [33], showing in figure 4 of source code of python tool for data analysis.

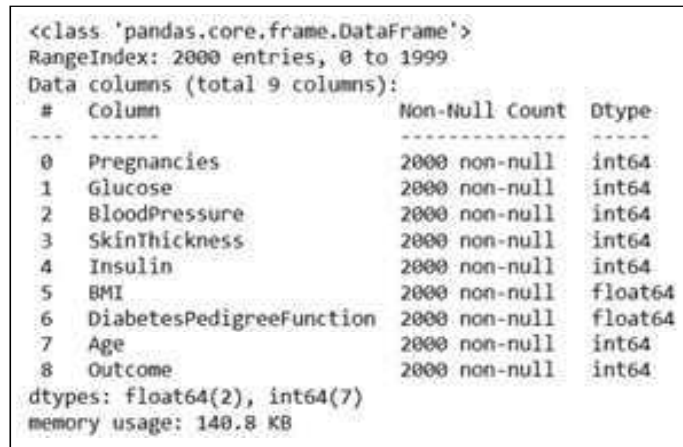


Figure 4. Tools of python as pandas

4. ANALYSIS AND RESULTS

To determine whether algorithm performs better in predicting diabetes, we evaluate the algorithms' accuracy and analyze their performance in this section.

4.1. PERFORMANCE PARAMETERS

The accuracy parameter will be used to determine nine characteristics of diabetes [33][34], which will then be measured in four terms in this study.

i. TP (True Positive) : When the values of the actual class and the expected class are both yes, it indicates that the positive value was accurately predicted.

ii. FP (False Positive): It means that if the expected class is yes and the actual class is no.

iii. TN (True Negative) : When the actual class value and the expected class value are both zero, it indicates that the negative value was accurately predicted.

iv. FN (False Negative) : It represents the case where the actual class is yes and the expected class is no.

This means that the formula for predicting diabetes accuracy using these terms is as follows.

$$\text{Accuracy of Diabetes Prediction} = \frac{TP}{(TP + TN + FP + FN)}$$

4.2. DATA ANALYSIS

Using their quartiles, numerical data can be graphically represented using a histogram. These graphical

representations, like the one in figure 5, it also demonstrates the distribution of every attribute and identify within several categories, thereby confirming the necessity of scaling.

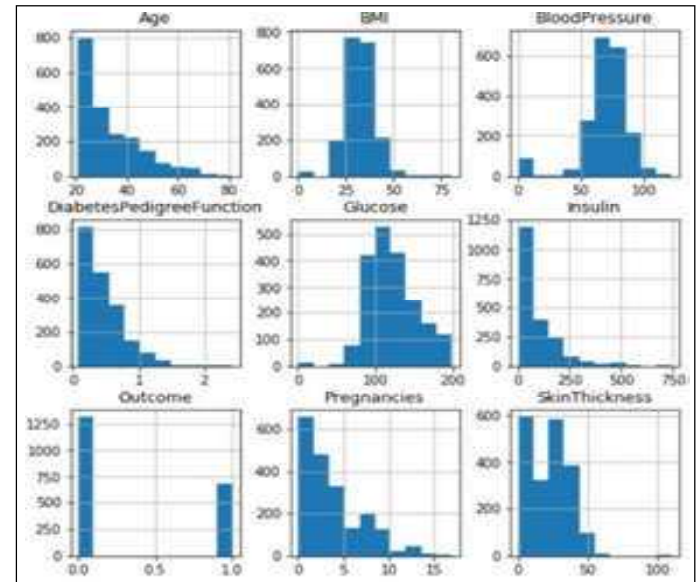


Figure 5. Histogram (Univariate outliers)

A statistical tool called correlation aids in determining the degree to which both variables be either negatively or positively connected as well as the influence of each on another [35][36]. Positive correlation occurs when two variables change in the identical direction, that is, when a growth or reduction in one of them also increases or lowers the other [37]. Negative correlation occurs when two values travel in the opposite ways [38]. It is clear that no one attribute significantly correlates to the result's value. There exists a positive association between certain traits and their result value, whereas others have a negative correlation. The correlation matrix in the following figure 6 represents a multivariate outlier.

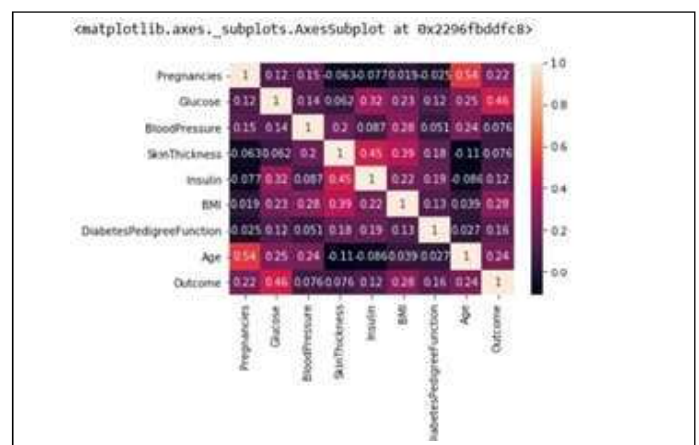


Figure 6. Correlation matrix (Multivariate outliers)

4.3. OUTCOMES OF DATA ANALYSIS

In this paper, four key algorithms- SVM (Support

Vector Machine), DT (Decision Tree), RF (Random Forest) and LR (Logistic Regression) -were utilized to predict and handle diabetes data. It will be evaluating the accuracy and outcomes of these algorithms in this part.

i. SVM (SUPPORT VECTOR MACHINE)

Through the adjustment of the separation of the hyper plane and data points, this classifier is trying to create a hyper plane which is capable of separating the classes. There are multiple kernels that are used to determine the hyper plane, that experimented using the linear, poly, rbf, and sigmoid kernels. Figure 7 below illustrates the SVM's accuracy over four different kernels.

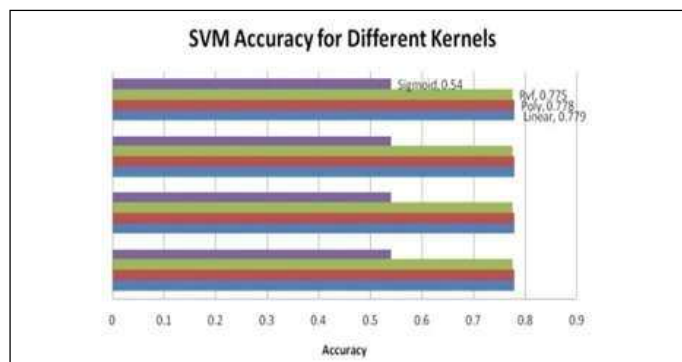


Figure 7. Accuracy of SVM

ii. DT (DECISION TREE)

Each point of data is allocated a class value by this classification algorithm after it builds a decision tree. The value of every attribute for a tree's decision-making is evaluated by attribute importance. Each attribute has a value from 0 to 1, with 0 denotes "no applied anywhere" but 1 denotes "accurately predict the outcome", seen in figure 8.

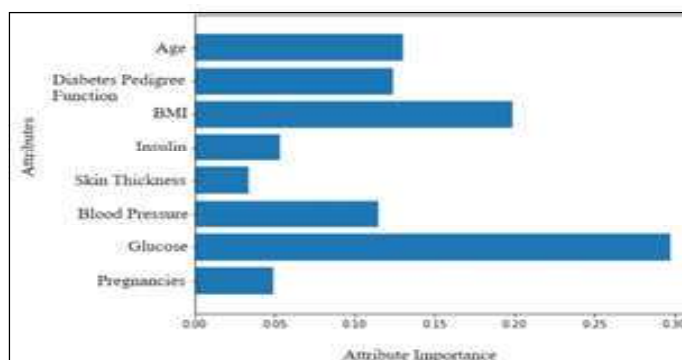


Figure 8. Accuracy of DT

iii. RF (RANDOM FOREST)

The random forest, like the one decision tree, prioritizes the Glucose attribute, but it additionally ranks BMI as the second useful, valuable attribute, illustrate in figure 9.

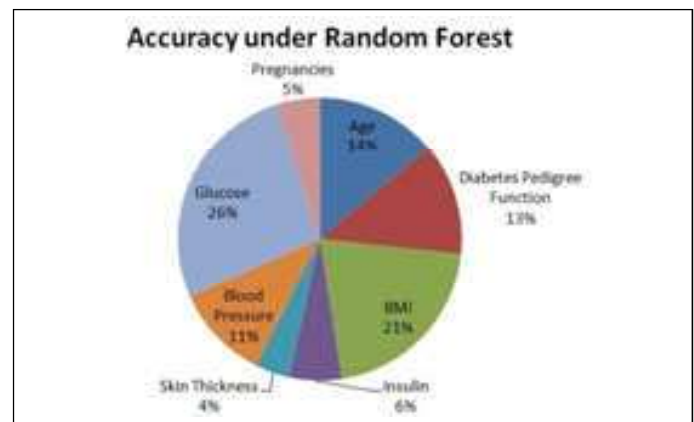


Figure 9. Accuracy of Random Forest

iv. LR (LOGISTIC REGRESSION)

LR is a widely used classification algorithm. The starting point of $C = 1$ in the first row results in 74% accuracy on training and 75% on testing. Selecting $C = 100$ leads to slightly decreased accuracy in the training dataset and slightly higher accuracy of the test set and indicating both lower regularity with a model with greater complexity may not perform more effectively than the starting point, showing in figure 10.

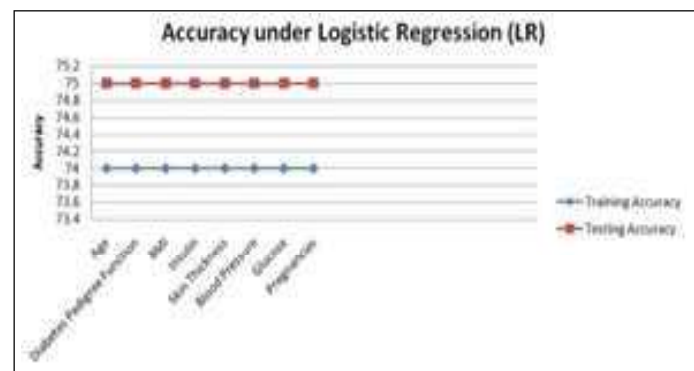


Figure 10. Accuracy of LR

5. DISCUSSION

Here, we will discuss the outcomes of the analysis and performance evaluation of the algorithms applied for predicting diabetes, in order to determine which algorithm performs the best. This is done after we have predicted and analyzed diabetes data.

5.1. INTERPRETATION OF RESULTS

In this section, analyze the algorithms and evaluate their results based on their accuracy to determine which algorithm is more accurate and better at predicting diabetes, which presented in table 2.

Following the evaluation of the data, the performance of the algorithms is measured by calculating their training and testing accuracy, as illustrated in Figures 11 and 12.

Proposed Data Handling Algorithms	Training Accuracy Results (%) under anomaly detection	Testing Accuracy Results (%) under anomaly detection
SVM (Support Vector Machine)	76	77
DT (Decision Tree)	97	98
RF (Random Forest)	92	96
LR (Logistic Regression)	74	75

Table 2. Analysis of results

First of all let's calculate the training accuracies of all the used algorithms like SVM, DT, RF and LR which can be seen in figure 11, so the training accuracy of decision tree (DT) algorithm is highest then this is the best according to training accuracy. The accuracy of SVM algorithm is the lowest so this algorithm is the least good compared to other algorithms.

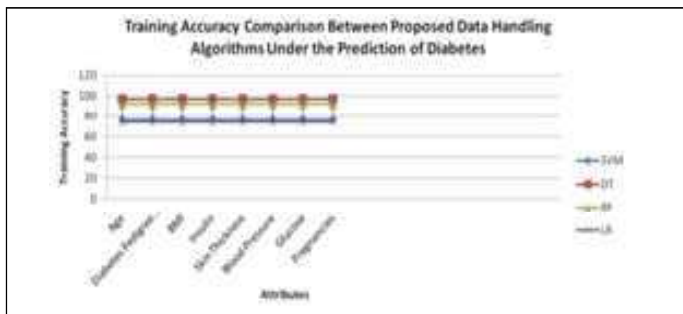


Figure 11. Training accuracy of proposed data handling algorithms

Following the review of training accuracy, evaluate the testing accuracy of all proposed algorithms, as shown in Figure 12. As a result, the SVM method has the lowest testing accuracy of any algorithm utilized, while the Decision Tree algorithm has the highest testing accuracy, making it the best algorithm to use.

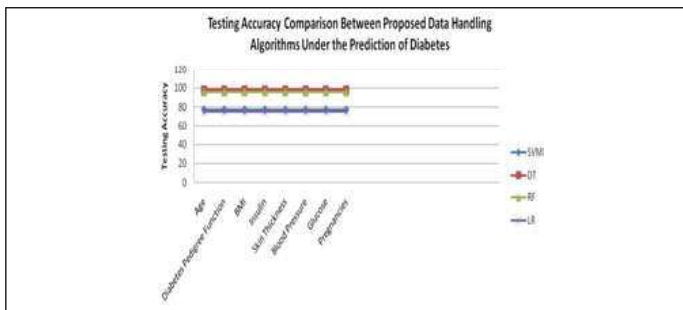


Figure 12. Testing accuracy of proposed data handling algorithms

5.2. COMPARISON WITH ALGORITHMS

In this section, perform a comparative analysis of all of the algorithms used in this research work to predict diabetes accuracy, as shown in Table 3.

Selected Algo. No.	Proposed Data Handling Algorithms for Diabetes Prediction under anomaly detection	Accuracy based Comparative Results
1.	SVM (Support Vector Machine)	Lowest accurate than other proposed algorithms
2.	DT (Decision Tree)	Highest accurate than other proposed algorithms
3.	RF (Random Forest)	Lowest accurate than DT but highest accurate than SVM and LR
4.	LR (Logistic Regression)	Highest Accurate than SVM but lowest accurate than RF and DT

Table 3. Performance evaluation between data handling algorithms under anomaly detection

5.3. LIMITATIONS OF THE STUDY

This research paper is related to machine learning algorithms and data science which are used in assessing various diseases in the healthcare system. In this research, only four algorithms of machine learning have been used and the accuracy of the healthcare system in predicting diabetes disease is not sufficient. Therefore, in machine learning, there can be mostly such algorithms which can be more accurate.

6. CONCLUSION

Diabetes is caused by excessive glucose levels in the body. Early identification of diabetes is a critical everyday problems healthcare problem. This study progressively designs a method for predicting diabetes based on anomaly detection. Anomaly detection is the process of identifying anomalies in dataset which differ from what is expected. This study evaluates four classification algorithms of machine learning as SVM, DT, RF and LR using accuracy measures. The study is conducted on a diabetic datasets sourced through the PIDD to Kaggle community. The results of the experiment show that the proposed system achieves 98% accuracy applying the DT (Decision Tree) method. The paper's work can be enhanced by finding further algorithms for machine learning to improve accuracy and outcomes.

6.1. SUMMARY OF KEY FINDINGS

Data science is used in this study work to examine disorders in the healthcare system, therefore the name Health Data Science (HDS). Data Science is a current technology that may be used to manage any form of data or data-related work, such as data analysis and security. In this study work, data science is employed to forecast the

- Continued on Page No. 40

A STUDY ON THE INPUTS PROVIDED IN THE TEACHER TRAINING INSTITUTIONS FOR TEACHER TRAINEES OF MYSORE AND HASSAN DISTRICTS

✉ **Dr. Chidananda A.L.**, Assistant Professor, Department of Studies and Research in Education, Karnataka State Open University, Mukthagangothri-570 006, Mysore, Karnataka State

INTRODUCTION

The present research study is a descriptive survey study. The investigator collected the data by means of a survey on the inputs provided in the teacher training institutions for teacher trainees of Mysore and Hassan Districts.

Any country needs to accord a high priority to its educational development and ensure its quality by producing right kind of personnel. As such education, in developing countries like India assumes a far greater importance. Attempts have been made at a larger scale in India at present towards bringing quality in education and thus trying to raise the quality of life in the country. Serious efforts have been made recently in our country in the area of providing infrastructure, upgrading curriculum, preparation of text books and establishment of administrative units to moderate educational programmes for which a big proportion of finances also have been allotted.

For educational programmes to be effective one should focus on a very important area, apart from those mentioned above i.e., the preparation of the teachers. The teachers play an important role in moulding the lives and careers of the students and through them the destinies of the nation. The role of the teacher is extremely crucial in the context of education, being the best instrument of change and nation building. The nation in fact places its future in the hands of the teacher who thus have to carry a heavy responsibility. India needs today good teachers even more urgently than it needs scientists, engineers and other specialists. The implementation of free compulsory and universal education at the primary level, as well as free education at the secondary level in most of the Indian states will bring masses of pupils into our classrooms.

Kothari Commission (1964-66) states that "The destiny of India is being shaped in the classrooms". This remark throws a flood light on the importance of education in modern India. The quality and character of elementary and secondary schools are dependent largely upon the quality and character of teachers. This will decide the extent of

progress of a society. The major task of preparing this type of teachers who are competent to face the needs of the society is the responsibility of teacher training Institutions.

National Policy of Education (1986) states that "Teacher has to play a pivotal role in reforming education at all levels. In order that they can play this role, they should be inspired by creative idealism and feel pride in their profession. Suitable steps should be taken to improve professional competence of teacher at all levels.

This task can be effective only if the teacher training institution work on sound principles, keeping into consideration the needs and expectations of the present society. The means and the methods adopted to achieve the said responsibility also needs to be in line with the objectives.

The understanding of the present scenario of teacher training institutions will give an appropriate picture of the ways in which attempts have been made to prepare effective teachers and also enlightenment about the discrepancies that need to be rectified.

NATURE OF TEACHER EDUCATION

National Policy on Education (1986) states, that "Investment in teacher education can yield very rich dividends because the financial resources required are small when measured against the resulting improvements in the education of millions. A sound programme of professional education of teachers is therefore essential for the qualitative improvement of education.

The three phases of teacher education or teacher development are pre-service, Induction and in-service. These are now considered as parts of a continuous process. The need to give the teacher an all round preparation for his work, both from theoretical and practical points of view, forms the main target of this continuous process.

Theory and practicum forms the two components of teacher education programme at the elementary level. Theory part consists of the cognitive inputs that are provided in languages and core subjects and general subjects. Practice teaching and other practical inputs form the bulk

of practicum. Both theory and practicum aim at providing the required skills and knowledge that are required to produce effective and efficient teachers.

PRESENT STATUS OF THE STUDY

The present Teacher Education system in India has got the history of not less than seven decades but the situation has not changed markedly in relation to expected outcomes in the present situation. Unless significant changes takes place at this stage much cannot be expected at the school level in terms of quality education. Reviewing the status of Teacher Education at different times, remarks have been made by individuals and commissions.

The Education Commission (1964-1966) has stressed the fact that Investment in Teacher Education can yield very rich dividends, because the financial resources required are small when measured against the resulting improvements in the education of millions. First rate teacher training institutions can thus play a crucial role in the development of education. Therefore the essence of a programme of teacher training needs to be qualitative and in its absence, Teacher Education becomes not only a financial waste but a source of overall deterioration in educational standards.

Elementary Teacher Education occupies a central position in the total programme of education. This programme is responsible for equipping the teachers with competence and objectives so that they may guide the destiny of the society and nation, through proper handling of future citizens.

The Education Commission (1964-1966) observes that, "the present Teacher Education curriculum fails to develop a sense of commitment and aspects of moral and legal accountability. Moral accountability is based upon a sense of responsibility a feeling that one is responsible to students, parents, colleagues and oneself. Legal responsibility on the other hand refers to one's employer in terms of fulfilling the condition of service. The main purpose of Teacher Education is to prepare the teachers with educated minds, coupled with training in teaching skills. Only then the standard of education can be maintained".

Theory and practice form the essential components of a sound programme of teacher training institutions. Practice should be preceded by theory. Practical aspect should be given real emphasis, so that the professional qualities and the skills required of a teacher is appropriately taken care. But the present curriculum in teacher education is burdened with too much of theoretical treatment The large component of theory papers that are accommodated

in the teacher education curriculum has retarded the growth of practical and pedagogical aspects.

The National Policy on Education (1986) emphasizes the importance of teachers and their training. The teacher performance is the most crucial input in education. In the ultimate analysis, the policies laid down are to be interpreted and implemented by the teachers through their personal example and teaching-learning process. The quality of teacher training programme plays a predominant role in their performance.

The National Policy on Education (1986) also recognizes the pivotal importance of teacher education. It treats pre-service and in-service education of teachers as inseparable. It has given priority attention to this aspect. Professional training of teacher is a prerequisite for recruitment in schools. A large number of teacher training institutions suffer from inadequate human, physical and academic facilities for providing good professional education.

National Policy on Education (1986) has therefore revised and updated the facilities that are provided for the qualitative improvement of the training of teachers in the teacher training institution. The conditions for pre-service, in service and continuing education have also been provided.

Unfortunately at present, teacher training institutions in India are confronted with multi-dimensional problems which require immediate and effective solutions, in the absence of which no programme of education reform or reconstruction can be implemented successfully.

Scanty studies have been done in relation to the above situation, of Teacher Training Programme. The proportion of the gravity of needs and the studies undertaken show a very high imbalance and this situation has given rise to the present study.

NEED FOR THE STUDY

The quality of teacher depends on the quality of preparation and training they receive in teacher training institutions. The quality of education we provide to our children therefore depends largely upon the quality of teachers we inject into the educational system.

Training of teachers happens to be a matter of national importance for India and rightly so because it is upon teachers that the task of inculcating the values and features of a socialistic and democratic society would eventually depend.

The present system of teacher education in India has come under adverse criticism in recent years even though

it has seldom been subjected to crucial analysis as a separate and important sector of education. This is so because it did not receive the priority which it should have received at the hands of policy planners in the country.

The existing teacher education programmes are overloaded with theory components and lack of balance in theory and practice components. Whether theory should follow practice or practice should follow theory in teacher education is a paradox.

The teacher education programmes that exist in the country, by and large, has a gap between the nature of education of teachers and the actual needs of the schools where the trained teachers are required to serve. Many of these institutions are mechanical in terms of their schedule of work. Their methods and curricula are stereo typed and are in the grip of a curricular inertia and their approaches are largely theory-oriented and they lack empirical sanctity. It is rather painful for those working in the field of teacher education to observe this gap helplessly.

Teacher Education curriculum at present reflects the traditional concept of instruction both in terms of its contextual organization and instructional procedures used on the classroom conditions. The present teacher education curriculum fails to develop a sense of commitment and aspects of moral and legal accountability. The teacher education curriculum at present is burdened with too much of theoretical treatment. The large component of theory papers accommodated in the teacher education curriculum has retarded the growth of practical and pedagogical aspects of the programme, which needs to be the heart and soul of the programme as this dimension contributes a lot to prepare effective teachers. This in turn has checked the growth of teacher education as an exclusively professional course.

Teacher education courses at different levels are the continuation of the patterns adopted more than quarter of a century ago. They embody course content, which is not helpful in preparing effective teachers. The theory courses in particular have no articulation with practical work and teaching skill requirements. The application of theory to practice is lacking and leaves enough space for revision and restructuring. The weightage on content is negligible. There is no conceptual framework in the overall course structure.

The investigator being involved in Teacher Education Programme at present has also observed a number of drawbacks which have motivated his to make an enquiry into the present inputs of Teacher Education Programme in order to find the discrepancies in the system.

The present state of affairs related to different components of teacher education in general and the inputs provided therein in particular has resulted in an urgent need to look at the present status of teacher education in terms of the specific objectives of teacher education. This re-thinking is needed more specially in the components of inputs, as it forms the core of the total teacher training programme.

OBJECTIVES OF THE STUDY

1. To study the inputs provided in terms of activities in the Teacher Training Institutions at Primary level of Mysore and Hassan Districts.
2. To study the inputs provided in terms of materials in the Teacher Training Institutions at Primary level of Mysore and Hassan Districts.
3. To study the inputs provided in terms of personal interactions in the Teacher Training Institutions at Primary level of Mysore and Hassan Districts.

VARIABLES OF THE STUDY

In this study the main variables were the responses of teacher educators of elementary Teacher Education with respect to the following aspects of the inputs provided to the teacher trainees.

1. Inputs related to SUPW : The responses of teacher educators towards this variable were studied in terms of the Socially Useful and Productive Work that is taught by the teacher educator and the periods allotted in the time table of the teacher training institutions for this subject.

2. Inputs related to Art experience : The responses of teacher educators towards this variable were studied in terms of the items that are taught by the teacher educator and the periods allotted in the time table of the teacher training institutions, for Art experience.

3. Inputs related to Physical Education : The responses of teacher educators towards this variable were studied in terms of the exercises and games that are taught by the teacher educator and the periods allotted in the time table of the teacher training institutions, for drawing, by way of theory and practice.

4. Inputs related to Music : The responses of teacher educators towards this variable were studied in terms of the vocal and instrumental music items that are taught by the teacher educator and the periods allotted in the time table of the teacher training institutions for music.

5. Inputs related to Health Education : The responses of teacher educators towards this variable were studied in terms of the theory and the practice that is taught by the

teacher educator and the periods allotted in the time table of the teacher training institutions for health education.

6. Inputs related to Value Education : The responses of teacher educators towards this variable were studied in terms of the theory and the practice that is taught by the teacher educator and the periods allotted in the time table of the teacher training institutions for value education.

7. Inputs related to Computer Education : The responses of teacher educators towards this variable were studied in terms of the theory and the practice that is taught by the teacher educator and the periods allotted in the time table of the teacher training institutions for computer education.

8. Inputs related to Work Experience : The responses of teacher educators towards this variable were studied in terms of the manual labour that is initiated by the teacher educator and the periods allotted in the time table of the teacher training institutions for work experience

9. Inputs related to Materials : The responses of teacher educators towards this variable were studied in terms of the materials that are provided in the library, laboratory, play grounds and the audio visual aids that are provided and the way they are used in the teacher training institutions by the teacher trainees.

10. Inputs related to Personal Interactions : The responses of teacher educators towards this variable were studied in terms of the opportunities that are provided through school cabinet, group work, educational tour, NSS programme and camps in the teacher training institutions, to facilitate personal interactions.

11. Teacher Trainees : These inputs have been studied as pre-requisites for teacher preparation and hence the competencies of future teachers also have formed the variable of the study.

TOOLS USED IN THE STUDY

In the present study the tool 'Questionnaire' was used to collect the information about the inputs provided in the teacher training institutions for teacher trainees of Mysore and Hassan Districts which was constructed by the investigator.

A tool titled "Questionnaire to study the inputs provided in the teacher training institutions for teacher trainees of Mysore and Hassan Districts was prepared".

POPULATION OF THE STUDY

In the present study, the population consisted of the teacher educators of seven Teacher Training Institutions situated in Mysore and Hassan Districts.

SAMPLE OF THE STUDY

Sampling is the process of selecting a sample from the population under study. The sample is usually defined as a small proportion of a population selected for observation and analysis. It is a collection consisting of the objects or individuals of population selected for the expressed purpose of representing the population.

There are two types of sampling methods: Non-probability sampling method and probability sampling method. For this study the investigator has used Simple Random Sampling method which is a non-probability sampling method. In Simple Random Sampling method each unit of the population is given an equal chance of being selected.

For the present study five Teacher Training Institutions of Mysore and Hassan Districts were selected as the sample of this study. There is representation from both Government and Aided Institutions.

For the present study ten teacher educators from five Teacher Training Institutions of Mysore and Hassan Districts were selected as a sample. They belong to both government and aided institutions.

The table showing the distribution of sample in terms of government and aided institutions.

Nature of Teacher Training Institutions	Government Institutions	Aided Institutions
Number of Teacher Training Institutions	2	3
Number of Teacher Educators	4	6

The study was confined to Mysore and Hassan Districts only. Among these institutions of Mysore and Hassan Districts, a representative sample has been selected for the study.

STATISTICAL TECHNIQUES OF THE STUDY

To study the status of the inputs in the Teacher Training Institutions of Mysore and Hassan Districts the investigator used the descriptive statistics. i.e., percentage analysis.

ANALYSIS AND INTERPRETATION OF THE DATA

ANALYSIS AND INTERPRETATION OF OBJECTIVE ONE

The first objective of the study was to find the inputs in terms of activities provided in the Government and Aided Teacher Training Institutions in Mysore and Hassan Districts. The analysis and interpretation of this objective has been done using percentage. The data related to this objective has been analysed under the following headings.

1. Practices relating to cultural activities.

2. Practices relating to NSS regular programme

1. Practices relating to cultural activities : In all the Aided Teacher Training Institutions, varieties of cultural activities are performed during daily assemblies and during the celebrations in the school. In 50% of the Government Teacher Training Institutions the varieties of cultural activities are performed only during daily assemblies and the other 50% Government Teacher Training Institutions the varieties of cultural activities are performed both during daily assemblies and the various celebrations.

2. Practices relating to NSS programme : In all the Government and Aided Teacher Training Institutions varieties of activities relating to social awareness, creative thinking, self-sufficiency and Personality growth have been practiced as part of the NSS regular programme.

The analysis of objective first i.e. The study of the inputs in terms of activities provided in the Government and Aided Teacher Training Institutions in Mysore and Hassan Districts given rise to the following interpretations.

As far as the cultural activities are concerned there is a difference in terms of activities that are provided in the Government and Aided Teacher Training institutions but there is a similarity among the Aided Teacher Training Institutions themselves in relation to the varieties of cultural activities that performed by the teacher trainees.

There is a difference among Government Teacher Training Institutions themselves in the importance assigned to the cultural activities to be performed by the teacher trainees.

There is a similarity between the Government and Aided Teacher Training Institutions in executing the programme of NSS, as all the Government and Aided Teacher Training Institutions attach importance to the performance of varieties of NSS activities.

The study has shown that there is a difference in relationship regarding the varieties of cultural activities that are performed in the Government Teacher Training Institutions and Aided Teacher Training Institutions. The Aided Teacher Training Institutions have these activities both during daily assemblies and during the celebrations. But Government Teacher Training Institutions have it only during the celebrations. It may be because Government Teacher Training Institutions do not have sufficient staff to initiate these activities in teacher trainees. The above results may be due to the inability of the Institutions to cover up the prescribed number of lessons within the stipulated time, as the prescribed syllabus is quite vast.

CONCLUSION

The nature and practice in terms of the activities that

are provided for teacher trainees vary from Government to Aided Teacher Training Institutions in several aspects. Some of these activities vary not only from Government to Aided Teacher Institutions but among the Government Teacher Training Institutions themselves and among the Aided Teacher Training Institutions themselves.

ANALYSIS AND INTERPRETATION OF OBJECTIVE TWO

The second objective of the study was to find out the inputs provided in terms of materials in the Government and Aided Teacher Training Institutions for the teacher trainees of Mysore and Hassan Districts. The analysis of interpretation of this objective has been done by using percentage. The data related to this objective has been analysed under the following headings.

1. Materials in terms of library facilities
2. Materials in terms of laboratory facilities
3. Materials in terms of playground facilities
4. Materials in terms of audio-visuals

1. Materials in terms of library facilities : In 60% of the Aided Teacher Training Institutions the librarian offers full time assistance to the teacher trainees in the Teacher Training Institutions, in the choice of library books and the other 40% of the Aided Teacher Training Institutions, both librarian and teacher educators offer assistance to teacher trainees. In all the Aided Teacher Training Institutions varieties of books and reading material is made available to the teacher trainees both within the working hours and outside the working hours. In all the Government Teacher Training Institutions there is no availability of the services of librarian and so the teacher educators themselves offer assistance to the teacher trainees in the use of the books and reference material and the same is made available to the teacher trainees both during the working hours and outside the working hours.

2. Materials in terms of laboratory facilities : In all the Government and Aided Teacher Training Institutions, the laboratory facilities are available for the demonstration by teacher educators and for practical work by student teachers.

3. Materials in terms of playground facilities : In all the Government and Aided Teacher Training Institutions, spacious playground is availed for the use of teacher trainees.

4. Materials in terms of audio-visuals : In all the Government and Aided Teacher Training Institutions, a wide range of audio-visuals are availed for the use of teacher trainees.

The analysis of the objective second i.e. the study of the inputs provided in terms of materials in the Government and Aided Teacher Training Institutions for the teacher trainees of Mysore and Hassan Districts given rise to the following interpretations.

As far as the library facilities are concerned, there is a difference between Government and Aided Teacher Training Institutions, regarding the services that are availed of a librarian. All the Aided Teacher Training Institutions have a librarian but all the Government Teacher Training Institutions do not have a librarian. Therefore the teacher educators themselves avail their services to the teacher trainees in the process of reference of library books and reading material.

There is a similarity between all the Government and Aided Teacher Training Institutions in availing the reading material to the teacher trainees both within the school working hours and outside the working hours.

There is a similarity between all the Government and Aided Teacher Training Institutions in availing a spacious playground for the use of teacher trainees.

There is a similarity between all the between Government and Aided Teacher training Institutions in availing a wide range of audio-visuals for the use of teacher trainees.

The study has shown that there is a difference in relationship regarding the availability of a librarian. All the Aided Teacher Training Institutions have a librarian while Government Teacher Training Institutions do not have a librarian on staff. It may be because the department has failed to appoint a librarian on staff in these Government Teacher Training Institutions.

CONCLUSION

The nature and practices in the Government and Aided Teacher Training Institutions, in relation to the materials that are availed to the teacher trainees, there is similarity in several aspects between the Government and Aided Teacher Training Institutions. As far as the availability of a librarian is concerned the Aided Teacher Training Institutions seem to take a better stand than the Government and Aided Teacher Training Institutions, where there is no availability of a librarian.

In all other spheres the Government and Aided Teacher Training Institutions stand on equal ground in providing the materials for the benefit of the teacher trainees.

ANALYSIS AND INTERPRETATION OF OBJECTIVE THREE

The third objective of the study was to find out the

inputs provided in terms of personal interactions in the Teacher Training Institutions of Mysore and Hassan Districts. The analysis and interpretation of this objective has been done by using the percentage. The data related to this objective has been analysed under the following headings.

1. Personal interactions facilitated through educational tour
2. Personal interactions facilitated through NSS camp
3. Personal interactions facilitated through community living

1. Personal interactions facilitated through educational tour : In all the Government and Aided Teacher Training Institutions the educational tour is undertaken once in two years as required by the syllabus for the teacher trainees. 60% of the Aided Teacher Training Institutions conduct it for 6-8 days and the other 40% of the Aided Teacher Training Institutions conduct it for 3-5 days. In all the Government Teacher Training Institutions the educational tour is conducted for 3-5 days.

2. Personal interactions facilitated through NSS camp : As far as NSS camp is concerned all the Government and Aided Teacher Training Institutions provide ample of opportunities through diverse activities to facilitate personal interactions during the 10 days of NSS camp.

3. Personal interactions facilitated through community living : In all the Government and Aided Teacher Training Institutions the system of internal assessment as per the directives of the Department creates the necessity for the teacher trainees to cultivate good qualities through community living.

In 40% of the Aided Teacher Training Institutions residential facilities for the teacher trainees to cultivate community living are provided, while 60% of the Aided Teacher Training Institutions and all the Government Teacher Training Institutions do not provide residential facilities but foster community living through group / team work among teacher trainees, squad system, school cabinet system and sharing of responsibility among the students.

The analysis of the objective third i.e. the study of the inputs provided in terms of personal interactions in the Teacher Training Institutions of Mysore and Hassan Districts given rise to the following interpretations.

With regard to the personal interactions facilitated through educational tour there is a similarity in conducting the educational tour once in two years in all the Government and Aided Teacher Training Institutions in adherence to the norms laid down by the Department. There is also a similarity among the Government Teacher

Training Institutions as regards the number of days for which educational tour is conducted.

As regards NSS camp too there is a similarity with reference to the NSS camp that is conducted once in two years and the activities during the camp in all the Government and Aided Teacher Training Institutions as they adhere to the directives of the Department.

There is a difference between the Government and Aided Teacher Training institutions with regard to the residential facilities that are provided to facilitate community living among the teacher trainees. Among the Government Teacher Training Institutions themselves there is a difference as no residential facilities are availed to the teacher trainees.

There is a similarity between Government and Aided Teacher Training Institutions and among Government Teacher Training Institutions themselves and among Aided Teacher Training Institutions themselves in the way community living is fostered through team work, squad system, cabinet system and so forth.

The study has shown that there is a difference in relationship regarding the residential facilities that are provided in the Teacher Training Institutions. All the Government Teacher Training Institutions do not have residential facilities may be because they are managed by the Government which does not provide for building and accommodation facilitates for the teacher trainees.

CONCLUSION

The nature and organization patterns with regard to inputs provided in terms of personal interactions in the Teacher Training Institutions for teacher trainees vary not only from Government and Aided Teacher Training Institutions but among Government Teacher Training Institutions themselves and among Aided Teacher Training Institutions themselves.

MAJOR FINDINGS OF THE STUDY

1. There is a difference between the Government and Aided Teacher Training Institutions as regards the number of periods allotted for B-Group Subjects. More activities and items are taught by Aided Teacher Training Institutions than in Government Teacher Training Institutions. In proportion to this the number of periods allotted for B-Group subjects are more than the limited number of periods that are allotted in the Government Teacher Training Institutions.
2. The Government Teacher Training Institutions excel in teaching instrumental music in addition to the

theory and vocal music, while the Aided Teacher Training Institutions provide only the minimum of theory and vocal music and no instrumental music at all.

3. There is a similarity as regards the indoor and outdoor games that are given importance in all the Government and the Aided Teacher Training Institutions.
4. A difference is found in relation to the use of Computer Education between the Government and Aided Teacher Training Institutions. While the aided Teacher Training Institutions have advance in the use of Computers, the same has not been introduced at all in the 50% of the Government Teacher Training Institutions.
5. The inputs in terms of activities between Government Teacher Training Institutions and Aided Teacher Training Institutions vary in several aspects. Some of these inputs in terms of activities vary not only from Government Teacher Training Institutions to Aided Teacher Training Institutions but they also vary among Government and Aided Teacher Training Institutions themselves.
6. There is a difference with regard to the varieties of cultural activities that are performed by the teacher trainees of the inputs in terms of activities provided in the Government and Aided Teacher Training Institutions.
7. There is a similarity between the Government and Aided Teacher Training Institutions in executing the programme of NSS, as all the Government and Aided Teacher Training Institutions attach importance to the performance of varieties of NSS activities.
8. The inputs in terms of materials between Government Teacher Training Institutions and Aided Teacher Training Institutions vary in several aspects. Some of these inputs in terms of materials vary not only from Government Teacher Training Institutions to Aided Teacher Training Institutions but they also vary among Government and Aided Teacher Training Institutions themselves.
9. There is a difference between Government and Aided Teacher Training Institutions, regarding the services that are availed of a librarian. All the Aided Teacher Training Institutions have a librarian but all the Government Teacher Training Institutions do not have a librarian. Therefore the teacher educators themselves avail their services to the teacher trainees in the process of reference of library books and

reading material. There is a similarity between all the Government and Aided Teacher Training Institutions in availing the reading material and laboratory facilities availed to the teacher trainees both within the school working hours and outside the working hours.

10. There is a similarity between all the Government and Aided Teacher Training Institutions in availing a spacious playground for the use of teacher trainees.
 11. There is a similarity between all the between Government and Aided Teacher Training Institutions in availing a wide range of audio-visuals for the use of teacher trainees.
 12. The inputs in terms of personal interactions between Government Teacher Training Institutions and Aided Teacher Training Institutions vary in several aspects. Some of these inputs in terms of personal interactions vary not only from Government Teacher Training Institutions to Aided Teacher Training Institutions but they also vary among Government and Aided Teacher Training Institutions themselves.
 13. There is a difference between the Government and Aided Teacher Training Institutions with reference to the number of days on which educational tour is conducted. This is so among the Aided Teacher Training Institutions too.
 14. There is a similarity with reference to the NSS camp that is conducted once in 2 years, and the NSS activities facilitated during the year in all the Government and Aided Teacher Training Institutions.
 15. There is a difference between the Government and Aided Teacher Training Institutions with regard to the residential facilities that are provided to facilitate community living among the teacher trainees.
 16. There is a similarity between Government and Aided Teacher Training Institutions and among Government Teacher Training Institutions themselves and among Aided Teacher Training Institutions themselves in the way community living is fostered through team work, squad system, cabinet system and so forth.
2. The curriculum of the Teacher Training Institutions is too unwieldy. This cripples the efficiency of the teacher educators in offering the opportunities to the teacher trainees at the practical level.
 3. There is a great need in the educational system of the Teacher Training Institutions to provide for more personal interactions and social relationship among the teacher trainees than just struggling to complete the portion.
 4. Quality of teacher education cannot be taken care of if the quantity of the syllabus is too unwieldy.
 5. On the one hand there is a demand from the department to provide quality education to the teacher trainees but on the other hand, no means are provided to achieve quality education. This is clear from the lack of computer hardware and other equipments to the Teacher Training Institutions.
 6. There is a demand from the department to have trained staff for the Teacher Training Institutions. But these posts are not sanctioned by the department. As a result the quality of teacher education suffers

LIMITATION OF THE STUDY

- The study is limited to the teacher training institutes of Mysore and Hassan Districts.
- The study is limited to the expressed responses. No investigation has been made regarding the quality of inputs under each of the teacher training institutes of Mysore and Hassan Districts.
- A few representative Teacher Training Institutes of Mysore and Hassan Districts have been included for the study.
- To a large extent the study undertaken is quantitative rather than qualitative.

SUGGESTIONS FOR FUTURE RESEARCH

1. A study on a larger sample for a larger population with special reference to the inputs provided in the Teacher Training Institutions for the teacher trainees can be undertaken.
2. The same study can be conducted as a comparative study between other districts of Karnataka.
3. The same study can be undertaken to measure the status of the inputs provided in different districts and the same can be compared at state level.
4. A study can be conducted to measure the effect of the teacher education course at elementary level in different Teacher Training Institutions in different

EDUCATIONAL IMPLICATIONS OF THE STUDY

1. The Teacher Training Institutions have the tendency to stick to the minimum inputs than going beyond the minimum requirements. Attention needs to be paid to the maximum training to be provided to the trainees.

variables like quality personnel, administrative setup and urban rural background.

5. A study can be conducted to evaluate the effectiveness of the teacher training programmes on the teacher trainee.

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accuracy of diabetes under anomaly detection in the healthcare system. To analyze the data, four algorithms of machine learning like SVM, DT, RF and LR have been used, which have been named data handling algorithm. Under anomaly detection, these four algorithms have been used to accurately predict diabetes. Therefore, the conclusion of this analysis was that the accuracy of the decision tree (DT) is the highest and the accuracy of the SVM algorithm is the lowest. In the same sequence, the accuracy of RF is less than DT but higher than LR and SVM.

6.2. CONTRIBUTIONS TO THE FIELDS

Although machine learning (ML) and data science (DS) have various uses, in this research, machine learning has been applied for healthcare systems such as identifying, diagnosing, assessing results, and preventing diabetes.

6.3. RECOMMENDATIONS FOR FUTURE RESEARCH

This research paper is only based on healthcare applications of machine learning in which only diabetes disease has been focused which is not enough. First of all,

this paper shows only one use of machine learning which is healthcare in which only diabetes disease has been analyzed, and then in future the data of any other disease health care system will be analyzed. The second shortcoming of this paper is that only four algorithms of machine learning have been used, so in the future more algorithms and methods of machine learning will be used.

ABBREVIATIONS

AI	Artificial Intelligence
DS	Data science
DT	Decision Tree
HDS	Health Data Science
KNN	K-Nearest Neighbors
ML	Machine Learning
LR	Logistic Regression
RF	Random Forest
SVM	Support Vector Machine

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JIDDU KRISHNAMURTI

(1895-1986)

✍ **Dr. Prakash K. Badiger**, Associate Professor, RIE-NCERT, Nellore (AP).

INTRODUCTION

Jiddu Krishnamurti (1895-1986) was a globally respected philosopher, spiritual teacher, and educational reformer. Unlike many educational thinkers, Krishnamurti did not propose a specific system or method of education. Instead, he focused on the psychological, emotional, and ethical development of the individual. He believed that true education is not just about acquiring knowledge but about understanding life and oneself.

His contributions to education are deeply philosophical and humanistic, offering a radical alternative to traditional models of learning.

EARLY LIFE AND BACKGROUND

Krishnamurti was born in Madanapalle, India, and was discovered at a young age by leaders of the Theosophical Society, who believed he would become a world teacher. Though initially involved with this spiritual movement, Krishnamurti later distanced himself from all organized religions and ideologies. He dissolved the Order of the Star in the East in 1929, famously declaring, "Truth is a pathless land." This act marked his lifelong stance against dogma and systems of thought that constrained the human mind.

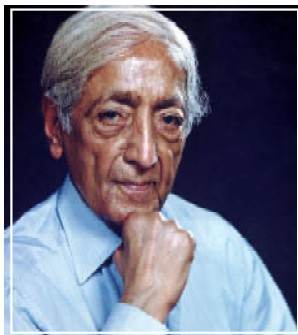
EDUCATIONAL PHILOSOPHY

At the heart of Krishnamurti's educational philosophy is the belief that education should help individuals understand themselves, rather than merely prepare them for careers or social conformity. He challenged the traditional focus on rote learning, competition, and authority, suggesting that these often lead to fear, aggression, and mediocrity.

KEY IDEAS

1. Education as the Awakening of Intelligence :

Krishnamurti believed that the goal of education is to awaken intelligence and not merely accumulate knowledge. He argued that modern education emphasizes memory and conformity, leading to mechanical thinking



and fear. For Krishnamurti, real intelligence comes from understanding oneself, observing life without bias, and thinking freely. He encouraged learners to ask questions, observe their thoughts and emotions, and be open to learning from life itself.

2. Freedom from Fear and Authority :

One of Krishnamurti's most important educational ideas was the concept of learning in an atmosphere free from fear. He strongly

opposed any form of compulsion, comparison, or competition in schools. He believed that fear destroys creativity and intelligence. He also questioned the authority of teachers who impose knowledge rather than guide students to think independently. According to him, true learning happens when there is freedom-freedom to explore, question, and make mistakes.

3. The Role of the Teacher : In Krishnamurti's view, a teacher is not just an instructor but a guide and co-learner. He believed that teachers should help students understand themselves and their relationship with the world, rather than simply deliver academic content. Teachers, therefore, must be self-aware and free from personal biases. He emphasized that the inner transformation of the teacher is just as important as the academic success of the student.

4. Holistic Education : Krishnamurti stressed the importance of educating the whole human being-mind, body, and spirit. He believed that education must include sensitivity to nature, appreciation for beauty, and development of ethical values. He advocated for the integration of academics with arts, nature study, meditation, and moral reflection. In his schools, students engage in both intellectual and emotional growth, with a focus on simplicity, mindfulness, and harmony.

5. Schools Based on His Philosophy : To put his educational ideas into practice, Krishnamurti established several schools in India, the United Kingdom, and the United States. Prominent examples include:

- Rishi Valley School (Andhra Pradesh, India)
- The School at Rajghat (Varanasi, India)

- Brockwood Park School (Hampshire, UK)
- Oak Grove School (California, USA)

These schools are known for their calm, natural settings and their emphasis on inquiry, dialogue, and self-discovery. They promote a non-competitive atmosphere, encourage inner discipline, and foster a deep respect for nature and human relationships.

6. Lifelong Learning and Self-Knowledge :

Krishnamurti emphasized that learning is a lifelong process. He urged students and adults alike to observe their thoughts and emotions and to live with awareness. For him, education should help people live wisely, not just succeed materially. He believed that self-knowledge-understanding one's own mind and behavior-is the foundation of right action in society.

CONCLUSION

Jiddu Krishnamurti's contributions to education are profound and transformative. He challenged traditional systems that focused on discipline, marks, and career success, and instead proposed an education that cultivates inner freedom, intelligence, and compassion. His ideas continue to inspire educators and thinkers around the world who seek to create learning environments where students can grow as whole, free, and responsible individuals. In today's complex and divided world, Krishnamurti's vision of education as a means to transform human consciousness is more relevant than ever.

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manner that helps you prepare for the inevitable end that awaits us all. And to prepare you knowing that death is a state of utter relaxation, as if relaxing into one's own self.

There are three ways to relax: physical relaxation, when the body is still and the muscles fully relaxed, mental relaxation, when the mind is unruffled by thoughts and emotions and finally, spiritual relaxation, when the mind merges in the inner spiritual self.

### CONCLUSION

A good yoga practice is one that allows its practitioners to achieve peace - with themselves and the external world they inhabit. The spiritual aspect of yoga emphasizes the attainment of peace and clarity of mind, while perfecting the posture is of secondary importance. When we practice yoga with a spiritual outlook, we acknowledge that the end purpose is transformation and awakening of our true inner self. Awakening of self means realizing our highest potential. Realizing our hidden potential allows us to express the fullness of our divine essence and to thereby make the greatest possible contribution to the world. Practicing yoga with this ultimate objective will eventually lead to spiritual fulfilment, a state of great bliss. The practice of yoga aimed at total integration includes a certain lifestyle, the practice of compassion and kindness, a vegetarian or important role in the fulfilment of the above objective.

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