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Editorial

Education in India has long been enriched by a profound intellectual and philosophical tradition known as the Indian Knowledge System (IKS). Rooted in ancient scriptures, indigenous pedagogies, and holistic learning approaches, IKS offers a wealth of insights relevant to modern teacher education. In the current discourse on educational reforms, integrating IKS into teacher training can help nurture well-rounded educators who embody both traditional wisdom and contemporary pedagogical skills.

This issue of our research journal brings together scholarly articles that explore the role and relevance of IKS in teacher education. The articles discuss how foundational Indian educational principles can contribute to shaping effective educators. Moreover, they examine how Indian epistemological traditions align with modern-day pedagogies, such as constructivism, competency-based learning, and inclusive education.

A key theme that emerges from these studies is the significance of contextualizing teacher education within India's rich cultural and philosophical heritage. From exploring the contributions of ancient scholars like Panini, Chanakya, and Rabindranath Tagore to examining yoga, mindfulness, and ethical reasoning as part of teacher training, the research highlights how IKS fosters not only cognitive development but also emotional and moral growth among teachers.

As India moves towards achieving global educational benchmarks, integrating IKS in teacher education can ensure a balanced fusion of tradition and modernity. This journal issue invites educators, researchers, and policymakers to reflect on how IKS can be systematically incorporated into teacher training programs, making education more meaningful, rooted, and future-ready.

Prof. Ramesh Ghanta

Teacher Education

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Contents

Editorial

Impact of Indian Knowledge System across Domains: A Comprehensive Analysis

Dr. Harsha Patil*

Abstract

This research paper investigates the profound impact of the Indian Knowledge System (IKS) across diverse domains, ranging from science and technology to healthcare, agriculture, and spirituality. By exploring the historical roots and contemporary relevance of IKS, the study aims to shed light on how traditional Indian wisdom has influenced and continues to shape various facets of modern society. The research underscores the significance of preserving and integrating this rich knowledge heritage for holistic development and cross-cultural understanding.

Keywords: Indian Knowledge System (IKS); Traditional Wisdom; Science and Technology; Agriculture; Healthcare; Holistic Development

Introduction

The Indian subcontinent has a rich tapestry of traditional knowledge systems that have been integral to its cultural, scientific, and social fabric (Mahadevan & Bhat, 2022; Rawat & Nagar, 2021). This research examines the far-reaching impact of the Indian Knowledge System (IKS) across different domains.

Objectives

This research aims to study the:

a) Ancient Texts' Influence on Diverse Aspects of Life
b) Impact of IKS on science and technology.

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c) The Influence of Ancient Indian Vastu on Contemporary Architectural Practices
d) Investigate the influence of IKS in agriculture and sustainable practices.
e) Explore the role of IKS in healthcare and holistic well-being.

Ancient Texts' Influence on Diverse Aspects of Life

Ancient Texts: Ancient Indian texts like Vedas, Upanishads, Bhagavad Gita etc. encompass a vast array of literature, religious scriptures, historical documents, and philosophical treatises from civilizations around the world [8, 9]. Here are some key lessons and insights from these texts:

a) Spiritual Wisdom: Ancient Indian texts delve deeply into spiritual wisdom, offering insights into the nature of existence, the self, and the universe. They emphasize the importance of self-awareness, mindfulness, and inner peace as paths to spiritual fulfilment.
b) Ethical Conduct: Many Indian texts, including the Mahabharata and the Ramayana, highlight the significance of ethical conduct and righteous behaviour. They emphasize virtues such as honesty, integrity, compassion, and respect for others.
c) Dharma: The concept of dharma, often translated as duty or righteousness, is a central theme in Indian texts. Dharma encompasses one's moral and social obligations, emphasizing the importance of fulfilling one's duties with sincerity and dedication.
d) Karma: Indian texts explore the concept of karma, the law of cause and effect, which dictates that our actions have consequences, both in this life and beyond. They emphasize the importance of acting selflessly and virtuously to create positive karma.
e) Detachment: The Bhagavad Gita, in particular, teaches the importance of performing one's duties without attachment to the results. It emphasizes the need to cultivate a sense of detachment from the fruits of our actions, focusing instead on the action itself and its inherent righteousness.
f) Yoga and Meditation: Ancient Indian texts provide detailed instructions on various forms of yoga and meditation practices aimed at achieving self-

realization and spiritual enlightenment. These practices emphasize the cultivation of inner peace, concentration, and self-awareness.

g) **Unity in Diversity**: Indian texts celebrate the diversity of human experience and the interconnectedness of all life. They advocate for tolerance, acceptance, and understanding across different cultures, religions, and social backgrounds.
h) **Importance of Knowledge**: The pursuit of knowledge is highly valued in Indian texts, with a focus on both spiritual and worldly wisdom. They emphasize the importance of education, self-improvement, and continuous learning as pathways to enlightenment and personal growth.
i) **Renunciation and Service**: Some texts advocate for the renunciation of worldly attachments as a means to spiritual liberation, while others emphasize the importance of selfless service (seva) to humanity as a form of devotion and spiritual practice.
j) **The Impermanence of Life**: Indian texts remind us of the impermanent nature of existence and the inevitability of change, urging us to cultivate equanimity and detachment in the face of life's ups and downs.

These texts provide invaluable insights into the cultures, beliefs, and philosophies of ancient civilizations and continue to influence modern thought and culture.

Impact of IKS on Science and Technology

The contribution of the Indian knowledge system to mathematics and science is profound and far-reaching, encompassing several key areas:

a) **Number System**: Perhaps the most significant contribution is the development of the decimal system, including the concept of zero (originally represented as a dot or a circle), which revolutionized mathematics worldwide. Indian mathematicians also made significant advancements in arithmetic, algebra, and geometry.
b) **Trigonometry**: Indian mathematicians, particularly from the Kerala School, made significant contributions to trigonometry. They introduced trigonometric functions such as sine, cosine, and tangent, and developed tables to facilitate astronomical calculations.

c) **Algebra**: Indian mathematicians made notable contributions to algebra, including the solution of quadratic, cubic, and quartic equations. They also developed algebraic methods for solving linear and simultaneous equations.
d) **Geometry**: The Sulba Sutras, ancient Indian texts dating back to around 800-500 BCE, contain geometric principles related to the construction of altars used in Vedic rituals. Indian mathematicians also made contributions to geometric concepts such as area, volume, and the Pythagorean theorem.
e) **Astronomy**: Indian astronomers made significant advancements in observational astronomy, calculating the positions of celestial bodies and predicting astronomical events with remarkable accuracy. They developed sophisticated mathematical models to explain planetary motion and eclipses.
f) **Medicine**: The Indian knowledge system includes ancient texts such as the Charaka Samhita and the Sushruta Samhita, which contain detailed knowledge of anatomy, physiology, surgery, and pharmacology. Indian physicians made pioneering contributions to medical science, including surgical techniques, herbal remedies, and diagnostic methods.
g) **Metallurgy**: Ancient Indians were skilled metallurgists, mastering techniques for extracting and refining metals such as iron, copper, bronze, and gold. They developed advanced methods for alloying metals and casting intricate metal sculptures and artefacts.
h) **Botany and Agriculture**: Indian knowledge systems include extensive botanical knowledge, with ancient texts describing the classification, properties, and medicinal uses of plants. Indian agricultural practices, such as crop rotation, irrigation, and soil conservation, have also been influential.

The Influence of Ancient Indian Vastu on Contemporary Architectural Practices

The Indian knowledge system has made significant contributions to architecture, shaping the built environment in profound ways [1]. Some of the key contributions include:

a) **Vastu Shastra**: Vastu Shastra is an ancient Indian architectural tradition that encompasses principles of design, layout, space planning, and spatial

geometry. It emphasizes harmony with nature, balance, and the use of sacred geometry to create buildings and cities that promote well-being and prosperity.

b) **Temple Architecture**: Indian temple architecture showcases intricate craftsmanship, geometric precision, and spiritual symbolism. Temples are designed as sacred spaces that facilitate spiritual connection and transcendence. Styles vary across regions, with notable examples including Dravidian, Nagara, and Vesara styles.

c) **Stupa and Chaitya Architecture**: Stupas and chaityas are Buddhist architectural forms that originated in ancient India. Stupas are dome-shaped structures containing relics or sacred objects, while chaityas are prayer halls or meditation chambers. These structures reflect the Buddhist principles of simplicity, mindfulness, and spiritual contemplation.

d) **Fortifications and Palaces**: Indian rulers built magnificent forts and palaces characterized by grandeur, opulence, and strategic design. Examples include the forts of Rajasthan, such as Jaipur's Amber Fort and Jaisalmer Fort, which feature elaborate palaces, courtyards, and defensive structures.

e) **Stepwells and Water Management**: Stepwells, known as baolis or bawadis, are architectural marvels designed to provide access to groundwater and facilitate water storage. These structures feature intricate staircases leading down to water reservoirs, often adorned with ornate carvings and sculptures. Stepwells demonstrate Indian ingenuity in water management and conservation.

f) **Urban Planning**: Ancient Indian cities, such as Mohenjo-Daro and Harappa in the Indus Valley Civilization, were meticulously planned, featuring well-organized streets, drainage systems, and public amenities. The grid layout of streets and the integration of public spaces reflect principles of urban planning and community living.

g) **Palace Architecture**: Indian palaces showcase exquisite craftsmanship, architectural innovation, and cultural refinement. Examples include the Mysore Palace, the City Palace in Jaipur, and the Udaipur City Palace,

which blend indigenous architectural styles with influences from Mughal, Rajput, and European traditions.

h) **Regional Diversity**: Indian architecture exhibits rich regional diversity, with distinctive styles and building techniques varying across different geographical regions and cultural contexts. From the wooden architecture of Kerala to the stone temples of Tamil Nadu, each region has contributed unique architectural expressions to India's cultural heritage.

Influence of IKS in Agriculture and Sustainable Practices

The impact of the Indian knowledge system on agriculture and sustainable practices is profound, with ancient wisdom providing valuable insights into sustainable farming techniques, environmental stewardship, and community resilience. Here are some key aspects of this impact:

a) **Traditional Farming Practices**: Indian agriculture has a rich tradition of traditional farming practices that emphasize harmony with nature and sustainable land management. Techniques such as organic farming, crop rotation, intercropping, and agro forestry have been practised for centuries, promoting soil health, biodiversity, and resilience to pests and diseases.

b) **Water Management**: Indian farmers have developed sophisticated water management techniques to cope with the challenges of erratic rainfall and water scarcity. Traditional methods such as rainwater harvesting, check dams, and canal irrigation have been used to capture, store, and distribute water for agricultural purposes, maximizing water efficiency and reducing dependency on groundwater.

c) **Crop Diversity**: Indian agriculture is characterized by a rich diversity of crops, reflecting the country's varied climatic conditions and agro ecological zones. Traditional crop varieties adapted to local conditions are cultivated alongside modern high-yielding varieties, ensuring resilience to environmental stressors and preserving genetic diversity.

d) **Seed Saving and Exchange**: Indian farmers have a long tradition of seed saving and exchange, preserving heirloom varieties and indigenous crop species. Community seed banks and farmer cooperatives play a crucial role

in safeguarding agricultural biodiversity and promoting farmer autonomy and resilience.

e) **Livestock Integration**: Traditional Indian farming systems integrate crop cultivation with livestock rearing, utilizing animal manure for soil fertility, draught power for ploughing, and diversified income sources for farmers. Agro-pastoral systems such as mixed farming and integrated crop-livestock-tree systems contribute to ecological balance and livelihood security.

f) **Community-based Management**: Indian agriculture has a strong tradition of community-based resource management, with practices such as collective irrigation systems (such as tanks and ponds), common grazing lands, and shared forest resources. These communal arrangements promote social cohesion, equitable access to resources, and sustainable stewardship of common property.

g) **Indigenous Knowledge Systems**: Indigenous knowledge systems, passed down through generations of farmers, offer valuable insights into local ecosystems, climate patterns, and agricultural practices. Traditional knowledge of crop varieties, planting calendars, weather forecasting, and pest management informs adaptive strategies for sustainable farming in diverse agro ecological contexts.

h) **Resilience to Climate Change**: Indian agriculture has demonstrated resilience to climate change through adaptive practices such as mixed cropping, drought-tolerant crop varieties, and water-saving technologies. Indigenous knowledge systems provide valuable adaptation strategies for mitigating the impacts of climate variability and extreme weather events on agricultural livelihoods.

Role of IKS in Healthcare and Holistic Well-being

The Indian knowledge system has played a significant role in shaping healthcare and holistic well-being through its rich tradition of Ayurveda, yoga, meditation, and other indigenous healing practices [5]. Here's how the Indian knowledge system has influenced healthcare and holistic well-being:

a) **Ayurveda**: Ayurveda, often referred to as the "science of life," is one of the world's oldest holistic healing systems. It emphasizes a personalized approach to health and wellness, focusing on balancing the mind, body, and spirit through diet, lifestyle, herbal remedies, and treatments. Ayurvedic principles, such as the concept of doshas (biological energies) and the importance of maintaining harmony with nature, continue to guide healthcare practices in India and around the world.
b) **Yoga and Meditation**: Yoga and meditation are integral components of the Indian knowledge system, promoting physical, mental, and spiritual well-being. Yoga encompasses a diverse range of practices, including asanas (postures), pranayama (breath control), and dhyana (meditation), which cultivate strength, flexibility, relaxation, and mindfulness. These practices have been shown to reduce stress, alleviate chronic conditions, and enhance overall quality of life.
c) **Mind-Body Connection**: Indian healing traditions recognize the interconnectedness of mind, body, and spirit in maintaining health and well-being. Practices such as meditation, pranayama, and mindfulness cultivate awareness of mental and emotional states, promoting self-regulation, emotional resilience, and psychosomatic healing.
d) **Herbal Medicine**: Traditional herbal medicine is an integral part of Indian healthcare, with thousands of medicinal plants used for preventive and therapeutic purposes. Ayurvedic pharmacology emphasizes the holistic properties of plants, including their taste, potency, and energetic qualities, in formulating personalized herbal remedies for specific health conditions.
e) **Holistic Approach to Wellness**: The Indian knowledge system advocates for a holistic approach to wellness that encompasses the physical, mental, emotional, and spiritual dimensions of health. Holistic healing modalities, such as Ayurveda, yoga therapy, and naturopathy, address the root causes of disease and imbalance, promoting holistic well-being and vitality.
f) **Diet and Nutrition**: Indian dietary traditions are informed by Ayurvedic principles of nutrition, emphasizing the importance of wholesome, seasonal foods that support optimal health and digestion. Ayurvedic dietary guidelines, such as eating according to one's dosha constitution and

balancing the six tastes (rasas), promote nourishment, digestion, and metabolic balance.

g) **Preventive Healthcare**: Indian healing traditions prioritize preventive healthcare strategies that focus on maintaining balance and harmony in the body-mind system. Practices such as dinacharya (daily routine), ritucharya (seasonal regimen), and svasthavritta (health-promoting lifestyle) aim to prevent disease, promote longevity, and optimize well-being through self-care and preventive measures.

h) **Community and Social Support**: Indian healing traditions emphasize the importance of community, social support, and interconnectedness in promoting health and healing. Traditional healing practices often involve community-based care, family support networks, and collective rituals that foster a sense of belonging, social cohesion, and mutual aid.

Conclusion

In summary, ancient texts offer valuable insights into the cultures, beliefs, and philosophies of ancient civilizations, influencing modern thought and culture. The Indian knowledge system has made enduring contributions to mathematics, science, architecture, agriculture, and healthcare, shaping the development of modern scientific disciplines, technologies, architectural traditions, sustainable agriculture practices, and holistic well-being approaches. Integrating traditional wisdom with modern innovations, India continues to lead in various fields, promoting environmental stewardship, food security, rural livelihoods, and overall holistic health and vitality.

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Role of the Indian Knowledge System (IKS) in the Sustainable Future of Quality Education

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Abstract

This research paper takes a close look at the deep-rooted connections between India's Indian Knowledge System and the universal goals of sustainable development defined in the United Nations' Sustainable Development Goals (UNDP). The study investigates the potential benefits of incorporating the Indian Knowledge System into modern education, shedding light on the positive outcomes that may emerge across different areas addressed by the SDGs. Furthermore, the researcher tried to explore how Vedic wisdom, yoga, and cultural practices foster consciousness and a holistic approach to sustainable living. From holistic health practices and sustainable agriculture to ethical education and global partnership across the domains, the paper illustrates how incorporating traditional wisdom enhances the effectiveness and cultural relevance of sustainable development initiatives. Recognizing the interconnectedness of global challenges, this research advocates for the integration of Indian knowledge systems to create a more inclusive and sustainable future, resonating with the spirit of "Vasudhaiva Kutumbakam"-the world is one family. (g20.in)

Keywords: Indian Knowledge System (IKS); Sustainable Future; Quality Education

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Introduction

The global pursuit of sustainable development has become an imperative, underscored by the United Nations' Sustainable Development Goals (SDGs) that envision a world of prosperity, equality, and environmental stewardship by 2030 (UNDP). As nations grapple with multifaceted challenges, there is a growing recognition of the need for diverse and inclusive approaches to address these issues effectively. In this context, the ancient Indian Knowledge System (IKS) emerges as a reservoir of profound wisdom, offering a unique perspective on sustainable living and holistic well-being (iks.org).

This research delves into the pivotal role that the Indian Knowledge System can play in shaping the sustainable future of quality education. Rooted in millennia-old traditions, India's ancient wisdom encompasses a wide array of disciplines, from Vedic philosophy to yogic practices and cultural insights. These time-honoured traditions not only reflect the cultural richness of the Indian subcontinent but also hold the potential to contribute significantly to the contemporary discourse on sustainable development (Sharma, 2023).

The objectives of this study are twofold: first, to explore the intrinsic connections between the principles embedded in India's traditional knowledge and the global aspirations encapsulated in the SDGs, and second, to investigate how incorporating these ancient insights into modern education can yield positive outcomes across various dimensions of sustainable development. As the world seeks innovative and holistic approaches to address pressing challenges such as climate change, inequality, and ethical governance, understanding and integrating IKS becomes increasingly pertinent.

This research paper adopts a multidisciplinary lens, drawing upon insights from education, environmental science, cultural studies, and philosophy. By weaving together these diverse perspectives, we aim to shed light on the transformative potential of IKS in redefining the contours of quality education for a sustainable future. Through a nuanced exploration of Vedic wisdom, yoga, and cultural practices, we will examine how these elements foster consciousness and a holistic

approach to living that resonates with the core principles of sustainable development.

As we navigate the complexities of the modern world, the study also endeavours to illustrate how IKS can offer practical solutions across domains such as holistic health practices, sustainable agriculture, ethical education, and global partnerships. By recognizing the interconnectedness of global challenges, this research advocates for the integration of Indian knowledge systems as a means to create a more inclusive and sustainable future—a vision encapsulated in the ancient Indian ethos of "Vasudhaiva Kutumbakam"- the world is one family (G20).

In essence, this research seeks to contribute to the ongoing dialogue on global sustainability by unravelling the potential of the Indian Knowledge System to shape the future of quality education. By doing so, it aims to offer insights that resonate not only with the cultural heritage of India but also with the shared aspirations of humanity for a more conscious, interconnected, and sustainable world.

Indian Knowledge System

The Indian Knowledge System (IKS) refers to the vast and ancient repository of wisdom, intellectual traditions, and knowledge that has evolved over thousands of years in the Indian subcontinent. Rooted in diverse cultural, philosophical, and scientific perspectives, the Indian Knowledge System encompasses a wide array of disciplines, including but not limited to philosophy, literature, medicine, astronomy, mathematics, yoga, and spirituality (Mandavkar, 2023).

Key components of the Indian Knowledge System

a) **Vedic Knowledge:** Derived from the Vedas, the oldest sacred texts of Hinduism, Vedic knowledge encompasses hymns, rituals, and philosophical discussions. It forms the foundation of various schools of thought in Hindu philosophy. (Sharma, 2023)
b) **Yogic Sciences:** Yoga, originating from ancient Indian traditions, is not only a physical practice but also a spiritual and philosophical discipline. It

includes diverse paths like Hatha Yoga, Bhakti Yoga, Jnana Yoga, and Karma Yoga, each addressing different aspects of life and consciousness.

c) **Ayurveda:** The traditional system of medicine in India, Ayurveda, emphasizes a holistic approach to health and well-being. It incorporates herbal remedies, dietary guidelines, and lifestyle practices to maintain balance in the body and mind. (Yadav, 2023)
d) **Indian Philosophy:** Encompassing schools such as Vedanta, Nyaya, Samkhya, and Mimamsa, Indian philosophy explores fundamental questions about existence, consciousness, and the nature of reality.
e) **Art and Literature:** Indian art and literature, including epics like the Ramayana and Mahabharata, showcase rich narratives and moral values. Classical dance forms, music, and literature contribute to the cultural and artistic dimensions of the Indian Knowledge System.
f) **Astrology and Astronomy:** Ancient Indian scholars made significant contributions to astronomy and astrology. Concepts like the calculation of planetary positions and the lunar calendar originated from Indian astronomical traditions.
g) **Ethics and Morality:** Indian ethical and moral principles are often rooted in religious and philosophical teachings, promoting virtues such as non-violence (ahimsa), truthfulness (satya), and self-discipline (tapas).
h) **Spiritual Traditions:** India has been a cradle for various spiritual traditions, including Buddhism, Jainism, Sikhism, and numerous sects within Hinduism. These traditions offer diverse paths to spiritual realization and enlightenment (Kapoor, 2016).

The Indian Knowledge System is characterized by its holistic and interconnected view of life, emphasizing the integration of physical, mental, and spiritual dimensions. It has a profound influence on the way individuals approach various aspects of life, from health and education to ethics and social relationships. In contemporary discussions, there is a growing interest in understanding how elements of the Indian Knowledge System can contribute to global conversations on sustainability, well-being, and holistic development.

Sustainable Future of Quality Education

The concept of the sustainable future of quality education is anchored in a multidimensional framework that incorporates various theoretical perspectives. This section delves into the theoretical underpinnings that shape our understanding of a sustainable education system, highlighting key elements essential for its realization. The United Nations' Sustainable Development Goals (SDGs) serve as a foundational framework for defining a sustainable future, emphasizing the interconnectedness of social, economic, and environmental dimensions. Within the SDGs, Goal 4 specifically addresses quality education, focusing on inclusive, equitable, and lifelong learning opportunities for all. (Mohanty, 2019) The theoretical foundation lies in recognizing education as a fundamental driver for sustainable development. Rooted in environmental education theories, the sustainable future of quality education includes fostering ecological literacy. This perspective emphasizes understanding the interconnectedness between human societies and the natural world, encouraging environmental stewardship. Human capital theory posits that education contributes to the development of individuals' skills and knowledge, ultimately enhancing economic productivity and societal well-being. The sustainable future of quality education, within this framework, aligns education with broader socio-economic development goals. Empowerment and Freedom: Drawing from the capability approach, a sustainable education system focuses on enhancing individuals' capabilities, empowering them with the freedom to lead a life they value. Quality education, in this context, is not merely about acquiring skills but fostering agency and enabling meaningful choices. Theoretical perspectives on cultural diversity and indigenous knowledge systems underscore the importance of culturally relevant education. Integrating the Indian Knowledge System (IKS) into the theoretical framework emphasizes the value of cultural diversity in shaping sustainable and meaningful learning experiences. The sustainable future of quality education aligns with theories of social justice, emphasizing equity, diversity, and inclusion. It seeks to address systemic inequalities, providing equal access to education and fostering a sense of belonging for all learners. Grounded in systems thinking, the theoretical framework recognizes the interconnected nature of educational, social, economic, and

environmental systems. A sustainable education system requires holistic strategies that consider the dynamic relationships within and between these systems. Lifelong learning theories highlight the importance of adaptability and continuous learning throughout one's life. The sustainable future of quality education embraces the idea of lifelong learning as a means to navigate an ever-changing world and contribute to sustainable development.

In synthesizing these theoretical perspectives, the sustainable future of quality education emerges as a dynamic and adaptive system that goes beyond traditional notions of academic achievement. It encompasses a holistic approach that addresses societal challenges, nurtures individual potential, and promotes environmental stewardship, thereby contributing to the overarching goals of sustainable development.

Connections between the Indian Knowledge System and SDGs

The Indian Knowledge System (IKS), with its deep-rooted philosophical, cultural, and scientific foundations, holds immense potential to play a transformative role in shaping a sustainable future for quality education. This section explores the specific ways in which IKS contributes to the enrichment and sustainability of educational practices:

a) **Integration of Yoga and Meditation:** Central to IKS is the incorporation of yoga and meditation practices. These techniques not only enhance concentration and mental clarity but also contribute to holistic well-being. In a sustainable education framework, integrating yoga can promote students' physical health, emotional resilience, and overall mental wellness.
b) **Balancing Academic and Life Skills:** IKS emphasizes a holistic approach to education that goes beyond academic achievements. It recognizes the importance of imparting life skills, ethical values, and emotional intelligence alongside traditional academic knowledge. This holistic perspective aligns with the SDGs, particularly Goal 4 (Quality Education), by fostering the development of well-rounded individuals.
c) **Ayurveda and Environmental Ethics:** IKS includes Ayurveda, a traditional system of medicine deeply intertwined with ecological

principles. The inclusion of Ayurveda in educational curricula can promote environmental ethics, ecological literacy, and a sense of responsibility toward the planet. Students can learn about sustainable living practices, biodiversity conservation, and the interconnectedness of human well-being with the environment. (Yadav, 2023)

d) **Teaching Sustainable Agriculture:** IKS's agricultural practices, rooted in principles like organic farming and permaculture, can be integrated into educational programs. Teaching sustainable agriculture not only imparts practical skills but also instills an understanding of the importance of environmentally friendly farming practices in achieving long-term food security. (Karuppiah, 2023)

e) **Moral and Ethical Values:** IKS places a strong emphasis on moral and ethical values, often embedded in ancient texts and cultural narratives. By incorporating these values into educational frameworks, the sustainable future of quality education can instill a sense of responsibility, compassion, and ethical decision-making in students, contributing to the development of responsible global citizens.

f) **Cultural Sensitivity and Inclusivity:** IKS recognizes the diversity of cultural practices within India. Integrating this awareness into education promotes cultural sensitivity and inclusivity. By celebrating cultural diversity, educational practices become more relevant and resonate with the lived experiences of students, fostering a sense of belonging and shared humanity.

g) **Vasudhaiva Kutumbakam (The World is One Family):** The core concept of "Vasudhaiva Kutumbakam" encapsulates the interconnected worldview of IKS. By incorporating this philosophy into education, students are exposed to the idea of global citizenship, emphasizing the interconnectedness of communities worldwide. This perspective aligns with the SDGs' overarching theme of fostering global partnerships for sustainable development. (G20)

h) **Understanding Interconnected Challenges:** IKS encourages a systems-thinking approach, helping students understand the interdependence of various global challenges. Whether it's climate change, poverty, or social

injustice, education informed by IKS can empower students to comprehend the complex web of interconnected challenges and inspire collaborative solutions.

i) **Continual Exploration of Knowledge:** IKS is not static; it encourages a continual exploration of knowledge. This aligns with the concept of lifelong learning, emphasizing adaptability and the ability to navigate a rapidly changing world. Educational systems rooted in IKS foster curiosity, critical thinking, and a love for learning that extends beyond formal academic settings.

j) **Integration of Traditional and Modern Knowledge:** IKS provides a bridge between traditional wisdom and modern knowledge. By integrating both, education becomes a dynamic process that respects heritage while embracing innovation. This integration prepares students for a future where they can draw upon diverse sources of knowledge to address contemporary challenges.

The Indian Knowledge System, with its holistic and interconnected approach, offers a unique and valuable foundation for the sustainable future of quality education. By infusing educational practices with the principles of IKS, we can nurture individuals who are not only academically proficient but also ethically responsible, environmentally conscious, and globally engaged. In this way, IKS becomes a cornerstone for building a generation of learners equipped to contribute meaningfully to a more sustainable and interconnected world.

Benefits of the Indian Knowledge System with a focus on SDGs

Incorporating ancient Indian wisdom into modern education offers a wealth of specific examples that can lead to positive outcomes across various areas addressed by the Sustainable Development Goals (SDGs). Here's a detailed exploration:

a) Holistic Well-being (SDG 3: Good Health and Well-being): Integrating yoga and meditation practices into school curricula can promote physical fitness, stress reduction, and mental well-being among students. Practices like pranayama (breathing exercises) and asanas (physical postures) not

only improve physical health but also enhance concentration, emotional resilience, and overall psychological well-being.

b) **Environmental Sustainability (SDG 13: Climate Action; SDG 15: Life on Land):** Teaching principles of permaculture and organic farming from ancient Indian agricultural texts like "Krishi Parashara" promotes sustainable agricultural practices. Students can learn about techniques such as companion planting, rainwater harvesting, and soil conservation, contributing to environmental sustainability and biodiversity conservation.

c) **Ethical Values and Social Justice (SDG 16: Peace, Justice, and Strong Institutions):** Incorporating moral stories and ethical teachings from ancient Indian epics like the Ramayana and Mahabharata fosters values such as compassion, honesty, and empathy. Students can analyze characters' moral dilemmas and ethical choices, developing critical thinking skills and a strong sense of social responsibility.

d) **Quality Education and Lifelong Learning (SDG 4: Quality Education):** Introducing philosophical concepts from ancient Indian texts such as the Upanishads and Bhagavad Gita enhances critical thinking and philosophical inquiry. Students engage in discussions on topics like dharma (duty), karma (action), and self-realization, fostering intellectual curiosity and a love for lifelong learning.

e) **Gender Equality and Empowerment (SDG 5: Gender Equality):** Studying historical figures like Rani Lakshmibai of Jhansi and Savitribai Phule, who fought against gender discrimination and advocated for women's rights, inspires students to challenge gender stereotypes. Educational materials can highlight their contributions to women's empowerment and gender equality, promoting inclusive and equitable attitudes.

f) **Poverty Alleviation and Economic Empowerment (SDG 1: No Poverty; SDG 8: Decent Work and Economic Growth):** Teaching principles of ethical governance and economic management from ancient Indian treatises like the Arthashastra encourages students to explore sustainable economic models. Concepts such as wealth redistribution, fair taxation, and

social welfare policies foster an understanding of poverty alleviation and inclusive economic growth.

g) **Cultural Preservation and Heritage Conservation (SDG 11: Sustainable Cities and Communities):** Incorporating traditional art forms like classical dance, music, and crafts into cultural education programs preserves and promotes India's rich cultural heritage. Students learn about the historical significance and artistic techniques of these art forms, contributing to the conservation of cultural diversity and heritage.

In conclusion, leveraging specific examples from ancient Indian wisdom enriches modern education and aligns it with the objectives of the Sustainable Development Goals. By integrating practices, teachings, and philosophies from India's diverse heritage, education becomes a powerful tool for promoting holistic well-being, environmental sustainability, ethical values, gender equality, economic empowerment, and cultural preservation, fostering a more just, inclusive, and sustainable world.

Conclusion

In the exploration of the "Role of the Indian Knowledge System (IKS) in the Sustainable Future of Quality Education," it becomes evident that the treasures of ancient Indian wisdom offer a transformative path forward for global education. The insights gleaned from this research illuminate the profound impact that integrating IKS can have on fostering a sustainable and enriching educational landscape.

As we stand at the crossroads of traditional wisdom and modern challenges, the potential of IKS to shape the future of education is both profound and promising. The holistic approach inherent in IKS, encompassing physical, mental, and spiritual dimensions, aligns seamlessly with the vision encapsulated in the United Nations' Sustainable Development Goals. The rich tapestry of Vedic wisdom, yoga, and cultural practices not only enhances the quality of education but also instills values essential for navigating the complexities of the contemporary world.

The integration of IKS into educational frameworks holds the promise of cultivating individuals who are not only academically proficient but also ethically grounded, environmentally conscious, and globally connected. The emphasis on holistic learning, ethical education, and environmental stewardship serves as a blueprint for a generation of learners who can address the multifaceted challenges of the 21st century.

Moreover, the inclusive and interconnected ethos of IKS contributes to the fostering of a sense of global citizenship. The principle of "Vasudhaiva Kutumbakam" underscores the interconnectedness of humanity, urging us to view the world as one family. In a time where collaboration and understanding are paramount, IKS provides a cultural bridge that celebrates diversity, promoting inclusivity and mutual respect.

As we conclude this exploration, it is imperative to recognize the importance of not merely preserving the legacy of IKS but actively integrating it into educational practices. The call to action is clear: educational institutions, policymakers, and communities must collaboratively work towards incorporating IKS into the curriculum, creating spaces that honour both traditional wisdom and contemporary knowledge.

In doing so, we pave the way for a sustainable future of quality education—one that transcends borders, respects cultural diversity, and equips individuals with the tools to lead meaningful lives. The role of IKS in this endeavour is not merely symbolic; it is a dynamic force that can propel education toward a harmonious and interconnected future. In the spirit of "Vasudhaiva Kutumbakam," let us embrace the profound lessons offered by the Indian Knowledge System. By doing so, we embark on a journey towards an educational paradigm that not only imparts knowledge but also cultivates wisdom—a future where the world truly becomes one family, bound together by shared values, aspirations, and the timeless wisdom encapsulated in the Indian Knowledge System.

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Web links

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Pre-service Teachers' Knowledge and Current Level of Implementation of Universal Design for Learning (UDL)

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Abstract

The recommendations of the key policies concerning the Right to Education Act, of 2009, the Rights of Persons with Disabilities Act, of 2016 and also The National Education Policy, of 2020 are stressing upon the need for the inclusion of all children with or without disabilities. The paradigm shift in the field of education promotes inclusive education on a large scale. Despite this transition still teachers have limited training when it comes to teaching in an inclusive classroom. Teachers must develop the necessary skills for engaging all diverse learners in an inclusive classroom with meaningful instruction. The recent hope of all the educators of inclusive schools turned towards the Universal Design for Learning (UDL) approach as it holds considerable promise to create an inclusive educational environment. The training of in-service teachers will be beneficial however in-service training alone will not suffice for the teachers. The pre-service training for the prospective teachers will prepare them well to face the challenges in an inclusive classroom. With this perspective, the researcher is curious to explore the knowledge of the prospective teachers on Universal Design for Learning (UDL) and their current level of implementation of UDL (based on practice teaching experience) in the present study. The researcher developed a questionnaire based on the earlier literature to be completed within 15-30

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minutes. It was designed to elicit information about the prospective teachers' knowledge and the current level of implementation of UDL. Hundred final-year B.Ed., students from three colleges of education were included in the study. The result of the study was analysed both quantitatively and qualitatively. The findings also suggest the training needs for the prospective teachers on UDL and Implications for teacher preparation.

Keywords: Universal Design for Learning (UDL); Prospective Teachers

Introduction

Change is the only constant phenomenon in the world. To adapt to the ever-changing world, one must keep learning and growing. Education is key to surviving in a world where things are rapidly changing. The field of education is changing day by day according to the needs of people in the society. This consistent change in education positively impacts the students' lives and the society they live. One such positive change in education is the education of all children with and without disabilities under the same roof through implementing inclusive education. The transition of education to inclusive education benefits all learners with diverse abilities, needs, and backgrounds. Several research has shown the significant benefit of educating students with diverse abilities in an inclusive learning environment. The inclusive education can build a strong inclusive community. Though a lot happening in the field of inclusive education the teachers of inclusive classrooms are still facing challenges in addressing the needs of diverse learners in an inclusive classroom.

Government organisations, private organisations and NGO sectors have taken several initiatives to provide training for in-service teachers. There are several long and short-term courses designed to benefit the teachers. This has benefited in developing concept knowledge and a positive attitude, but still, there are struggles for teaching in inclusive classrooms. There is no second thought that in-service training for teachers will benefit them. However, that alone will not be sufficient

to provide effective teaching in inclusive classrooms. Training has to begin from the pre-service stage which will build competent human resources to contribute to inclusive education.

In recent years Universal Design for Learning framework work gained a lot of attention among educators and its been considered as the one-stop solution for all the struggles teachers face in an inclusive classroom. When we talk about inclusive classrooms, we can't ignore the accessibility. The UDL (Universal Design for Learning) approach provides flexibility in education along with accessibility. Preservice teachers have chosen the field of education with a lot of dreams to build the education world. The pre-service training and the teaching exposure they gain during this period will mould them as better educators.

UDL and Indian Knowledge System

Ancient India laid the foundations of several fields. Education is one among them. Ancient Indian civilization contributed intensively and extensively to different aspects of knowledge and various fields of teaching and enhanced the horizons of human society. The education system of ancient India was culturally and spiritually enriched and advanced. India laid strong foundations for Several contemporary concepts and Universal Design for Learning (UDL) is not an exemption. There is a high relevance between the Universal Design for Learning and the Indian Knowledge System. Both UDL and IKS aim to promote holistic and inclusive approaches. As we are aware, the Indian knowledge system encompasses a variety of aspects of cultural, philosophical, scientific and linguistic traditions. These aspects helped to shape the intellectual heritage of Indians. UDL also lines up with this, by its three effective principles of representation, engagement, action and expression in multiple ways. Oral recitation and experiential learning are the two keys of the ancient Indian education system, UDL encourages learners from diverse backgrounds to access to knowledge depending on their learning preferences including digital accessibility. UDL promotes skills like thinking, reflecting, and problem-solving which are the key aspects of the Indian knowledge system. The contemporary educational concept UDL highly complements the traditional Indian knowledge system. In Famous Indian Epics like Ramayana and

Mahabharata, proofs are imparting holistic education is the core focal area of UDL. The UDL framework is also aligns with Vishnu Sharma's Panchatantra, the text that is used to teach life lessons and wisdom to the princes of a king. Through the collection of tales, the book aims to impart political wisdom and practical knowledge to young prices through tails of animals, moral lessons, and metaphors. The complex life lessons are simplified and delivered. These simple stores have varied forms of expressions like narration, role play, discussions etc., making learning more engaging. The essence of Panchatantra aligns well with UDL. Perspective teachers need to understand this flexible and potential to be modified nature of education to suit different learners to make them a valuable resource for inclusive education.

Need and Importance of the Study

Exploring the preservice teachers' knowledge and their present level of implementation is significant as it gives the details about the knowledge base of UDL covered in the B.Ed. curricula, as preservice teachers are at an important juncture of building up their career it is essential to have a look on their professional development their beliefs and practices at the pre-service stage as it will have a significant impact in their future teaching. UDL is been recognized by everyone as an effective tool for an inclusive classroom, it is important to find out how far it is been integrated as part of pre-service training. Such studies give us a clear idea on the knowledge and implementation gap and it would also help the educators and policy makers to improve the pre-service training program in a better way.

The revamping in B.Ed. curricula took place in the year 2015, the two years B.Ed. program encompasses good theoretical and practical components for the student teachers. Every B.Ed. program has an Inclusive education paper as part of the core subject or elective subject. The inclusive education paper covers various pedagogical approaches in an inclusive classroom. As UDL is one of the effective frameworks that work effectively in an inclusive classroom, the present study is taken to discover the preservice teachers' knowledge on Universal Design for Learning approach and its principles and to explore how far the preservice teachers utilize the principles of UDL during practice teaching (the current level of

Implementation of UDL principles). The study result will significantly contribute to designing short training programs on UDL for prospective teachers, and identify areas that needs improvement and refinement founded on the present implementation levels. In the broader sense, the study also contributes to bridging the gap and pave the way for a more inclusive and accessible educational system.

Objectives of the Study

1. To explore the preservice teachers' knowledge on Universal Design for Learning.
2. To find the difference between male and female preservice teachers' knowledge about UDL
3. To find the differences in knowledge on UDL among preservice teachers of two colleges of education
4. To find the differences between undergraduate and postgraduate teachers' knowledge on UDL
5. To find the difference between the preservice teachers' knowledge based on their pedagogical subjects
6. To find the current level of implementation of UDL based on preservice teachers' experience in teaching practice
7. To find the preservice teachers' interest in learning about UDL in the future

Methodology

Participants

Participants are from Mysore, Karnataka. 65 student teachers from two colleges of education took part in the study. Two colleges were selected based on the convenience sampling technique.

The number of participants from both colleges is shown in table 1

Table 1: Number of Student Teachers and Names College of Education

S. No	College of Education	Number of Student Teachers
1.	College 1- BGS College of Education, Mysore, Karnataka	35
2.	College 2- The Institute of Education, Onkarmal College of Education, Mysore, Karnataka	30

Tools

To collect necessary data, the researchers used a questionnaire, which consisted of 39 questions under four sections. The number of questions under each section varies and its given in the table 2

Table 2: Domains and Number of Questions

S. No	Sections	Number of Questions
1.	Demographic Details	07
2.	Knowledge	15
3.	The current level of UDL Implementation	15
4.	Information for further learning	02

The questionnaire's first section was about demographic details. This section elicits the basic information from the participants, the second section is on the Knowledge. This consists of 15 multiple-choice questions; these questions were prepared by referring to the UDL guidelines and checkpoint version 2.0 (2011). The third section is to gather the details regarding the present level of implementation. 15 statements were prepared based on three principles of UDL, these statements were modified from the self-assessment tool of UDL prepared by the University of Waikato for higher education teachers. Modifications were made, according to the needs of student teachers based on their teaching practice experience. The fourth section of the questionnaire has two questions that give an understanding of their interest in further learning about UDL.

Procedure

The researcher approached the Principles of the College of Education, explained the need to conduct the study and its importance of the study and received permission to administer the study on second-year, 4th-semester students. Upon receiving permission for data collection, the Google form of the questionnaire was sent to the respective email IDs of preservice teachers. The questionnaire was sent to a total of 85 preservice teachers from both colleges and 65 filled-in responses were returned from the student teachers. The response rate is 76%.

Analysis

The questions under the knowledge domain were analysed quantitatively i.e., for every correct answer a score of '1' was given and for every incorrect answer a score of '0' was given. The responses to the statements under the current level of implementation were gathered on a 5-point Likert scale (Always, Very Often, Often, Sometimes and Never). To analyse the current level of implementation of UDL by preservice teachers' the following criteria were set. Always to Very other above 50% is considered as preservice teachers are implementing the UDL principles during teaching practices. Often to Sometimes above 50% is considered as student teachers are partially implementing UDL principles during teaching practice. Never and above 50% is considered as student teachers are not implementing the UDL principles during teaching practices. Student teachers' responses based on the above-mentioned criteria for each question/statement were cumulated and discussed with appropriate literature.

Results and Discussion

Demographics

In total 65 participants took part in the present study from two colleges of education. Among them 50 participants are female and 15 are male participants. The age of the participants varies between 23 years to 37 years. All student teachers are in their 4^{th} semester of the course (second year) and completed with the practice teaching at schools. Among 65 participants, 31 participants are graduates and 34 student teachers are post-graduates. In the present study students from different

pedagogical subjects took part. The details and number of preservice teachers and their pedagogical subjects are given in table 3.

Table 3: Number of preservice teachers and their Pedagogical Subjects

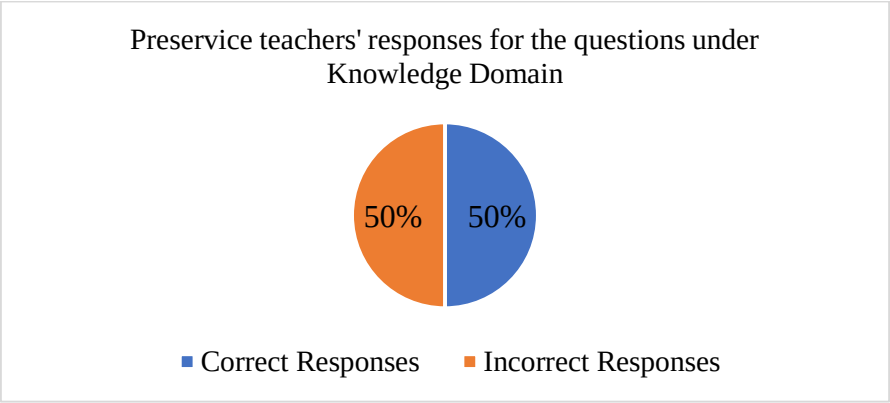
S. No	Pedagogical Subject	Number Preservice Teachers
1.	Physics and Mathematics	27
2.	Chemistry and Biology	08
3.	Commerce and Geography	09
4.	Kannada & History	12
5.	English and History	09
	Total	65

In the present study, pedagogical subjects with Physics and Mathematics are high in number and Chemistry and biology are less in number.

Knowledge

The first objective was to explore preservice teachers' Universal Design for Learning (UDL) knowledge. It was found that 50 % of the preservice teachers gave correct responses indicating prospective teachers' knowledge about UDL and the remaining 50% of the preservice teachers gave incorrect responses indicating teachers' inadequate knowledge on UDL as shown in figure 1.

Figure 1: Preservice Teachers' Responses for the Questions under the Knowledge Domain

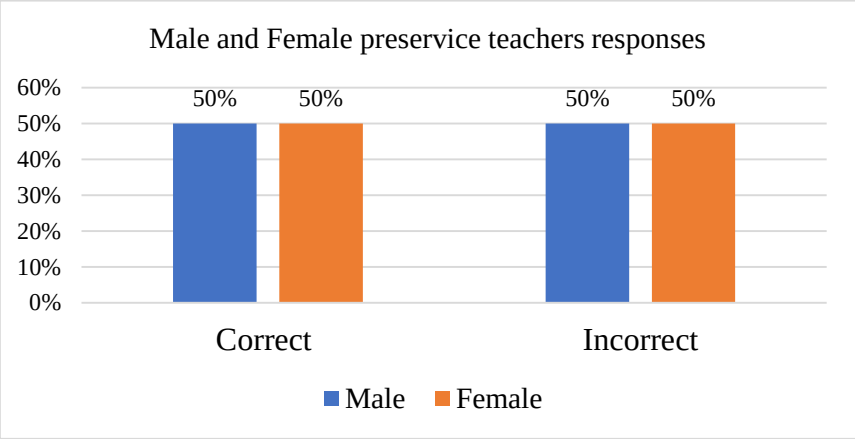


A large number of preservice teachers were aware on the basic information about UDL. Like the expansion of UDL, the principle of UDL, how does UDL support learners in the classroom. However, preservice teachers have less awareness of the neuroscience background of UDL and how it supports learning in an inclusive classroom etc., Similar findings reported by Vaughn, Bos, and Schumm (2009), preservice teachers lack fundamental knowledge and skills to teach in inclusive classroom catering to diverse need of the learners.

Gender

Finding the differences between male and female preservice teachers' responses to the questions under the knowledge domain. Results indagates, both male and female teachers have given 50% of the correct responses for the knowledge-based questions which is depicted in the below figure 2.

Figure 2: Male and Female Preservice Teachers' Responses for the Question under the Knowledge Domain

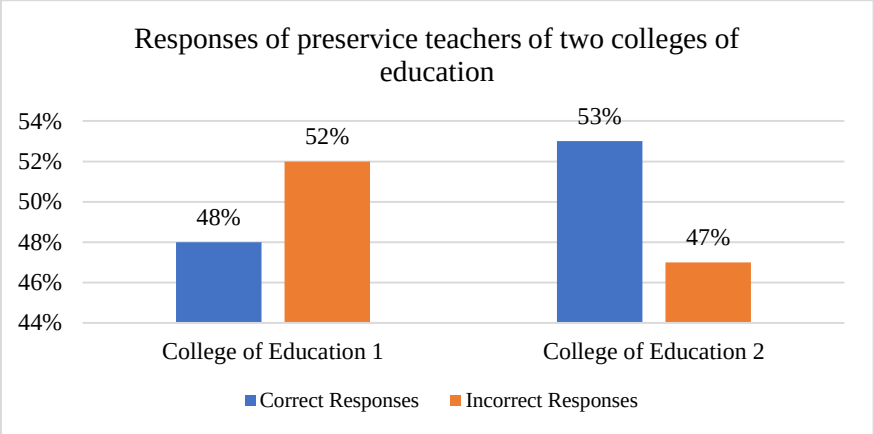


College of Education

In the present study, finding the differences among responses of preservice teachers of two colleges of education is the third objective. The responses between the two colleges of education are compared. As per the percentage scores, college -2

preservice teachers gained 53% indicating better knowledge about UDL as compared to college -1 preservice teachers' as given in figure 3.

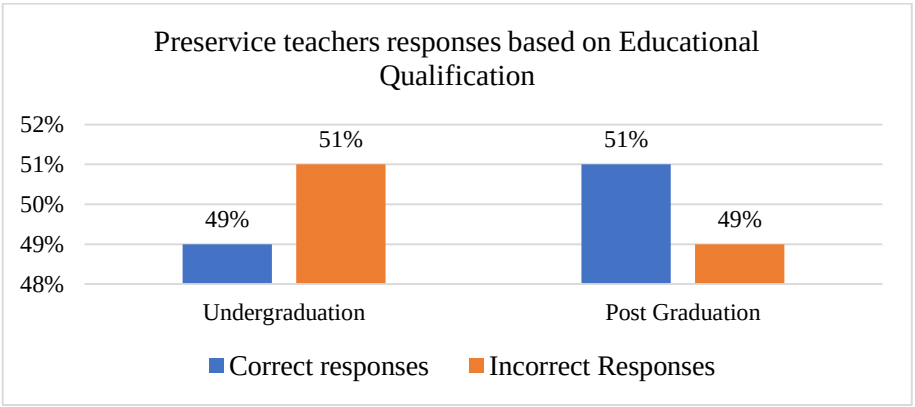
Figure 3: Responses of Preservice Teachers from Two Colleges of Education



Educational Qualification

The fourth objective was to find the differences between undergraduate and postgraduate teachers' knowledge about UDL. The percentage of correct responses given by the preservice teachers who qualified post-graduation was more than the preservice teachers who qualified under graduation as depicted in figure 4. It implies Postgraduate teachers had more knowledge of UDL as compared to undergraduates.

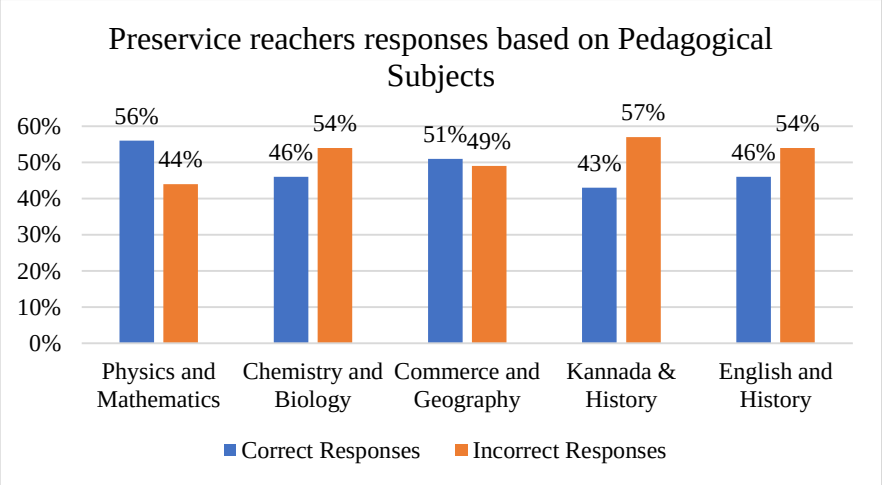
Figure 4: Preservice Teachers' Responses based on Educational Qualification



Pedagogical Subjects

The fifth objective is to find the difference between the preservice teachers' knowledge based on their pedagogical subjects. In the present study, preservice teachers are of five different pedagogical subjects namely Physics and Mathematics, Chemistry and Biology, Commerce and Geography, Kannada and History, English and History. The percentage of correct responses given by preservice teachers who opted for Physics and Mathematics is high i.e. 56% as compared to the preservice teachers who opted for the other pedagogical subjects. However, the study findings contradict the findings given by Norman, Caseau and Stefanich (1998) that the preservice science teachers lack in fundamental understanding of disabilities and lack in knowledge on pedagogical practice that supports learners with disabilities in inclusive classroom. The responses of participants based on different pedagogical subjects is depicted in figure 5.

Figure 5: Preservice Teachers' Responses based on Pedagogical Subjects



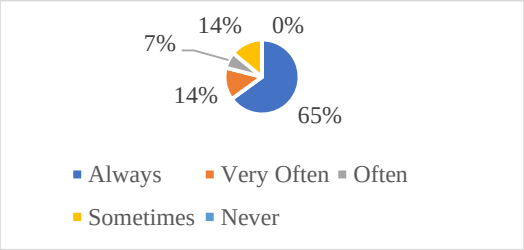
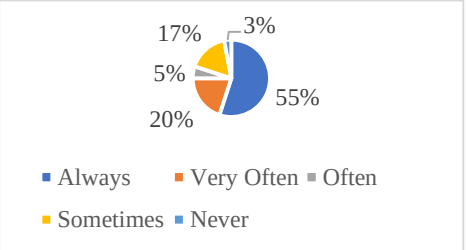
The current level of Implementation

Finding the current level of implementation of UDL based on their experience in teaching practice is the sixth objective. To understand the preservice teachers' current level of UDL implementation, 15 statements were prepared based on the principles of UDL.

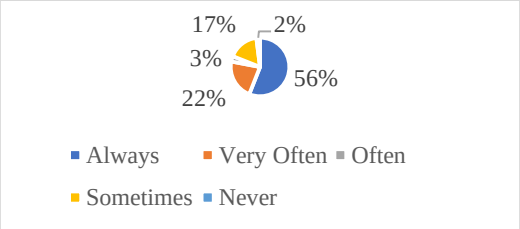
Statements from 1-5 are based on the first principle of UDL i.e., Multiple Means of Representation. For the first statement on providing digital accessibility to the learners for better understanding, 78% of pre-service trainees responded between always and very often. 75% of student teachers responded between always and very often for the statement on providing an outline and important keywords before starting a new lesson. More than 75 % of student teachers responded they use multiple options like audio, visual aids, videos, concept maps, drama, and lectures to teach important concepts. More than 65% of preservice teachers responded between always and very often that they explain keywords, important words, Acronyms, and new vocabulary with meanings, and symbols, before starting teaching and during their teaching. 77 % of preservice teachers' responses were between always and very often they use prior knowledge of the students to support their understanding of new concepts.

For the statements based on the first principle, a large number of the preservice teachers' responses, lie between always and very often. This shows student teachers are implementing the first principle of UDL during practice teaching. The responses of the preservice teachers for each statement under the first principle of UDL is given in the table 4.

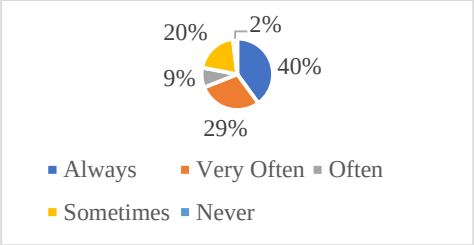
Table 4: Statements for First Principle of UDL and Preservice Teachers' Responses

Statements based on the First Principle of UDL- Multiple Means of Representation	
1. I provide a digital version of the teaching content to my students for better understanding and accessibility	***2. I provide an outline of the lesson and important keywords before starting a new lesson***
	

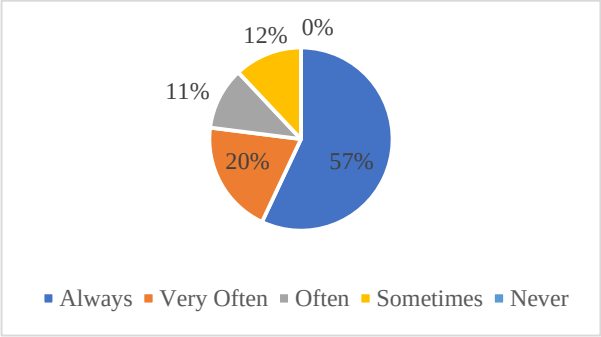
3. I use multiple options to teach an important concept
(For example: audios, visual aids, videos, concept maps, drama, lectures etc.,)



4. I explain keywords, important words, Acronyms, and new vocabulary with meanings, and symbols, before and during my teaching



5. I use prior knowledge of the students to support their understanding of new concepts
(For example: brainstorming relevant experience, reflective questions, group/ pair discussions, content prediction activities)

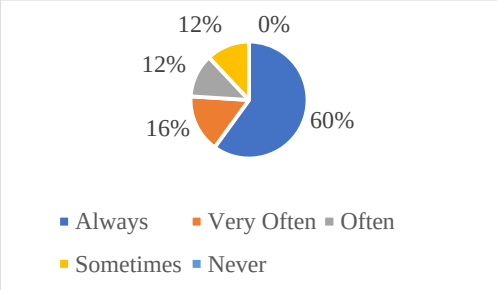
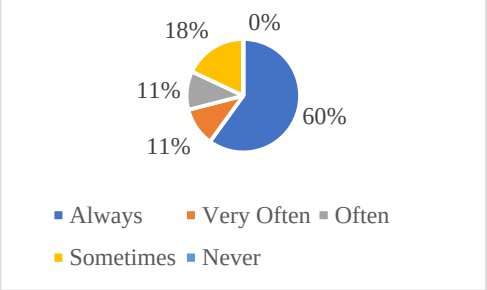


The statements from 6-10 are based on the second principle of UDL i.e., Multiple means of Engagement. 75% of preservice teachers responded between always and very often for the statement regarding, encouraging students to approach them. More than 70% of preservice teachers responded between always and very often to create an inclusive classroom environment. However, 35% of participants'

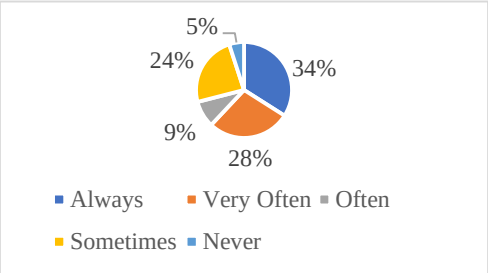
responses were between often to never. 62% of preservice teachers' responses were that they increase/decrease the level of difficulty of the content based on the abilities of the students. More than 80% of preservice teachers' responses were that they would offer choices to their students in assessment and other tasks. 74% of student teachers responded between always and very often, for the statement to offer a choice to the class students in assessment and other tasks.

For the statements based on the second principle of UDL a large number of the responses of prospective teachers lie between always and very often. Thus, it shows they are implementing the second principle of UDL during teaching practice. The responses of the preservice teachers for each statement under the second principle of UDL are given in the table 5.

Table 5: Statements for the Second Principle of UDL and Preservice Teachers' Responses

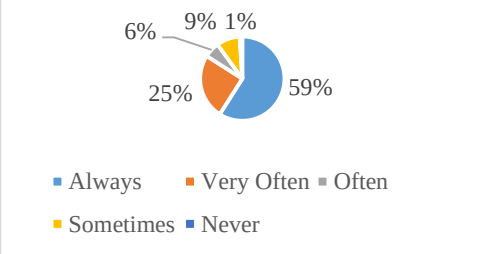
Statements based on the second Principle of UDL- Multiple Means of Engagement	
1. I encourage my students to approach me to discuss their doubts and needs (For example: I provide brief overview, I provide my working hours, I provide my contact details)	***2. I create an inclusive classroom environment that fosters collaboration and respect for diverse needs***
	

3. I increase the level of difficulty of the content based on the ability of the students



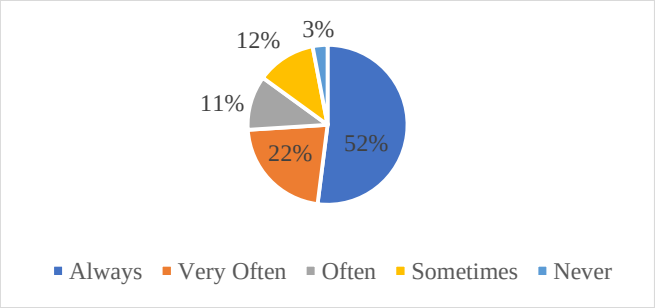
4. I offer choices to my students in assessment and other tasks

(For example: types of assessment, degree of difficulty/ challenge, order of the task, type of reading material and their formats)



5. I provide opportunities for the student to self-evaluation strategies

(For example: by setting personal learning goals, choosing their best work, etc.,)

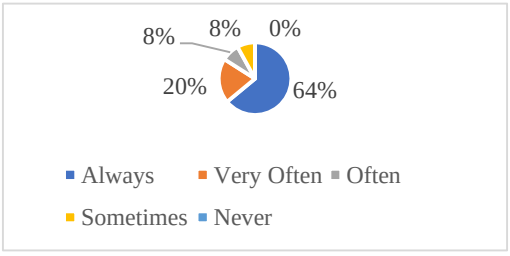
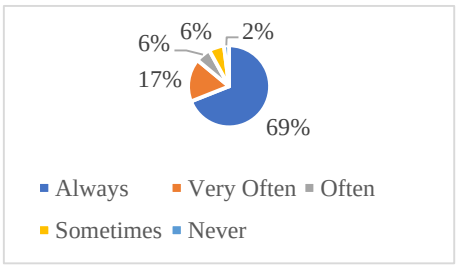


The statements from 11-15 are based on the third principle of UDL i.e., Multiple Means of Action and Expression. 84% of preservice teachers responded between always and very often that they encourage and allow their class students to express their learning in multiple ways like demonstration, painting, essay writing, poster presentation, etc., More than 85% of preservice teachers' responses were they provide clear guidance and success criteria for assessment and activities for the students. 86%

of prospective teachers expressed that between always and very often they provide clear information about learning strategies. However, 14% of preservice teachers expressed between often and sometimes. For the statement on encouraging their students to use different note-taking tools of their choice, 77% of prospective teachers responded between always and very often. 75% of prospective teachers responded that they consider the need for flexibility in assessment.

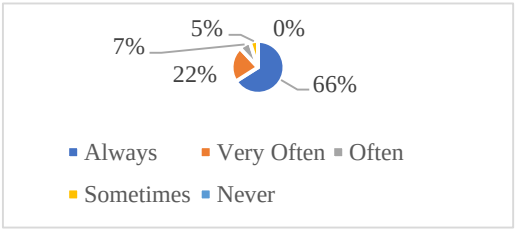
For the statements based on the third principle of UDL a large number of responses of the prospective teachers lie between always and very often. This exhibits that they are implementing the second principle of UDL during teaching practice. The responses of the preservice teachers for each statement under the third principle of UDL are given in table 6.

Table 6: Statements for the Third Principle of UDL and Preservice Teachers' Responses

Statements based on the third Principle of UDL- Multiple Means Action and Expression	
1. I encourage and allow my students to express their learning in multiple ways (For example: Demonstration, Painting, essay writing, poster presentation, PPts, etc.,) 	***2. I provide clear guidance and success criteria for assessment and activities*** 

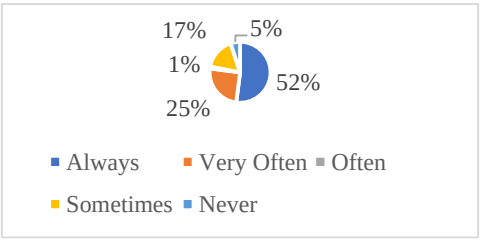
3. I provide clear information on learning strategies

(For example: checklists, note-taking methods, time management strategies, etc.,)



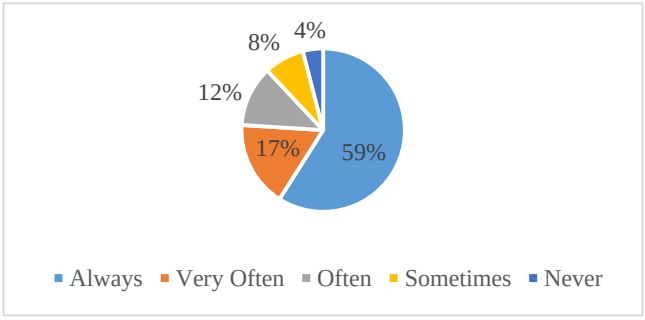
4. I encourage my students to use note-taking tools of their choice

(For example: digital assistants like laptops, audio recorders, collaborative note taking, braille not taking etc.,)



5. I consider the need for flexibility in assessment and text

(Example: Alternative venue, time breaks, different seating arrangements, prompts etc.,)



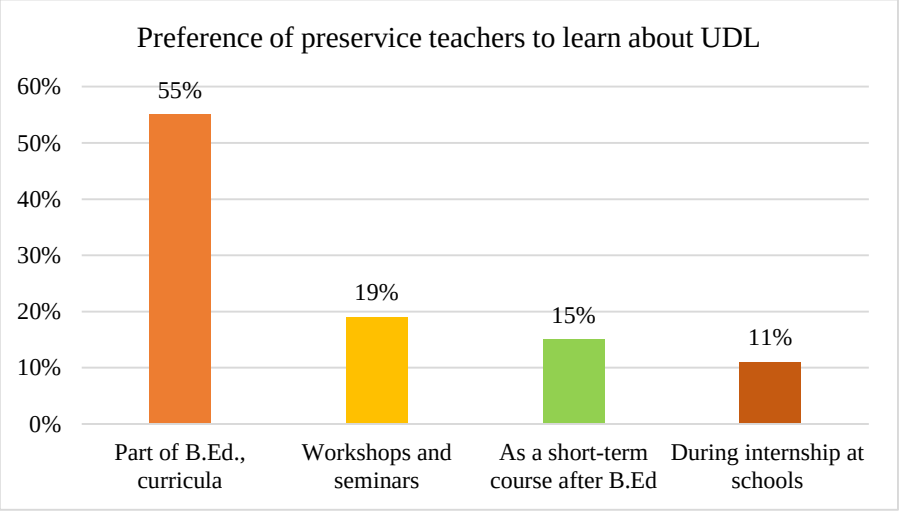
The findings of the preservice teachers' current level of implementation level of UDL its clearly show that most of the prospective teachers were implementing the principle of UDL during practice teaching. This shows preservice teachers are trying to transfer their theoretical knowledge of UDL into practice. Similarly, Schulman (1986) emphasizes in his study that student teachers can translate their theoretical knowledge to students' pedagogical content knowledge the study results

also highlight that the preservice teachers interpret the subject matter and find suitable ways to represent the information according to learners' need and their prior knowledge.

Information for Further Learning

The seventh objective of the study is finding preservice teachers' interest in learning about UDL in the future. To explore this there were two questions under this section. For the question on eliciting the interest to learn about UDL, 94% of pre-service teachers responded they would like to learn more about UDL. The second question in this section is how they wanted to learn about UDL. The responses of the participants are depicted in figure 6.

Figure 6: Preference of Preservice Teachers to Learn About UDL



55% of participants responded they wanted to learn UDL as part of B.Ed., curricula, 19% of prospective teachers responded they preferred to learn about UDL as part of workshops and seminars, 15% of them responded they preferred to learn about UDL after B.Ed., program as a short-term course and 11% of the participants responded that they would like to learn during internship at schools (teaching practice phase)

Key Findings

1. Overall, only 50% of correct responses were received from the preservice teachers in knowledge of UDL
2. There is no difference between male and female preservice teachers' knowledge on UDL
3. Preservice teachers qualified post-graduation have better knowledge eon UDL as compared to those who qualified under graduation.
4. Preservice teachers with Physics and Mathematics pedagogical subjects and better knowledge of UDL compare to those who opted other pedagogical subjects.
5. Preservice teachers were positive about teaching in an Inclusive classroom
6. Preservice teachers are using the principles of UDL during teaching practices.
7. The study reveals that preservice teachers are interested to learn more about UDL and it also reveals that they would prefer to learn it as part of B.Ed. curriculum.

Limitations

1. The study was conducted for only two Colleges of Education in the Mysore district.
2. The number of preservice teachers in the study is small in number. Therefore, it is difficult to draw firm conclusions hence findings cannot be generalized
3. In-depth analysis on the selected domains Knowledge, Understanding and application of UDL questions can be included to justify the level of awareness and implementation skills of preservice teachers.

Suggestions for Further Study

1. A similar study could be taken up for all College of Education students and in Mysore districts and Karnataka state.
2. Similar studies can be conducted in different states and results could be compared nationwide.

Conclusion

The College of Education contributes immensely to building a nation by preparing skilful human resources for the education field / inclusive education. The present study findings suggest that preservice teachers have knowledge on Universal Design for Learning (UDL). They are much aware of UDL concept, its principle etc., however they lack knowledge in part of the neuroscience connection of UDL and learning, how it supports learner in an inclusive classroom. The findings also highlight that the preservice teachers are implementing UDL principles during their practices teaching phases. For the enhancement of preservice teachers' knowledge on UDL preservice teachers need more training on UDL as part of their B.Ed. curricula, the principles of UDL can be included as part of Micro teaching practice so that it can be utilised effectively in Macro teaching during internship. During the practice teaching phase there should be monitoring checklist for preservice teachers to check their implementation of UDL principles effectively. This would enable to create a huge number of human resources/manpower for inclusive education and in turn, it will help us to build an inclusive society.

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Harnessing the Power of ICTs: ICTs as a Game-Changing Toolset for 21st Century Integration and Accessibility of Indian Knowledge Systems

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Abstract

Information and communication technologies (ICTs) have become potent tools in the dynamic 21st-century landscape, capable of reshaping economies, educational systems, and society. India is leading the way in a high-tech transition that might bring together traditional knowledge and innovative discoveries. The country has its roots in a varied range of knowledge traditions, ranging from ancient scriptures to current inventions. India has an extensive diversity of knowledge systems that have been woven together over millennia by the experiences of many different communities. These systems cover an astounding range of knowledge, from astronomy and ecological management to conventional medicine and agriculture. The centuries-old wisdom that has been passed down through the generations is embodied in the ancient Indian knowledge system, which includes disciplines like Ayurveda, Yoga, Vedas, and other art forms. An exceptional chance to conserve, disseminate, and modernize India's intellectual and cultural legacy is presented by fusing this abundance of information with the technological capability provided by ICTs. Due to ageing and environmental reasons, many priceless scriptures and manuscripts are susceptible to deterioration. With the use of cutting-edge technologies, digitization projects can

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guarantee the preservation of historical records, preserving them for future generations while opening them up to a worldwide audience. Furthermore, digital archives and repositories can act as online treasure troves, promoting extensive traditional knowledge inquiry and study in India. Through online platforms, webinars, and e-learning modules, individuals globally can access classes on Indian philosophy, art, medicine, and more. The democratization of knowledge fosters cross-cultural dialogue and advances awareness of the richness and diversity of the Indian knowledge system on a global scale. India's rich cultural and intellectual legacy may be preserved, disseminated, and brought up to date with great potential thanks to the synergy between ICTs and the Indian knowledge system. ICTs have the power to facilitate the seamless fusion of traditional knowledge with contemporary discoveries through digitalization, sharing, cooperation, and creativity. This will create a vibrant and diverse knowledge ecosystem in India and abroad. This research article tries to emphasize the transformative significance of ICTs in facilitating the seamless integration of the Indian knowledge systems.

Keywords: Digitization; Digital Library; IKS; Technology; Online Platforms

Introduction

India's civilization is one of the most intricate and richly intertwined in all of human history. A knowledge system spanning a wide range of disciplines, including medicine, astronomy, mathematics, and philosophy, pulsated in ancient India, from the sun-drenched coasts of the Indian Ocean to the towering peaks of the Himalayas. These systems, developed over thousands of years, were living wisdom that shaped the social and cultural structure of a thriving society. They went beyond simple academic pursuits. The whispers of this age-old wisdom, meanwhile, run the risk of becoming a far-off echo that only a few people can hear over the bustle of modern life (Mandavkar, 2023). This is where the transformative power of information and communication technologies (ICTs) shines as a beacon of hope,

providing a game-changing toolkit for integrating and revitalizing India's massive repository of knowledge systems for the 21st century. The twenty-first century has seen a rapid and revolutionary integration of information and communication technologies (ICTs) into many parts of our lives. This connection has not only transformed how we interact and access information, but it has also provided new potential for the preservation, diffusion, and accessibility of traditional knowledge systems (Researcher, 2022). In the Indian setting, with its rich and diverse knowledge traditions, the use of ICTs has the potential to be a game-changing tool for the integration and accessibility of its knowledge systems. ICTs are a broad category of technologies that make information generation, processing, storing, and sharing easier. These technologies include, but are not limited to, social media, mobile devices, artificial intelligence, big data, and the internet (Díaz-Mendoza et al., 2023). The generation, distribution, and consumption dynamics of knowledge have undergone major changes due to the ubiquitous nature of ICTs. This offers the Indian context a special chance to use these technologies to not only protect and advance ancient knowledge systems but also to increase their accessibility to a worldwide audience. Enhancing accessibility is another benefit that could arise from the integration of ICTs with Indian knowledge systems. This richness of knowledge can be made accessible to a worldwide audience through digital platforms and online repositories, encouraging collaboration and understanding across cultural boundaries. ICTs can also help traditional practitioners and contemporary experts share knowledge, which can result in the creation of novel solutions and the advancement of both fields of knowledge. India can preserve its rich cultural legacy and take the lead in international knowledge sharing by utilizing these technologies. The objective of the present research article is to investigate the several ways that ICTs can be used in the twenty-first century to strengthen Indian knowledge systems.

Transformative Significance of ICT

Through the digitization of historical locations, artifacts, and manuscripts, technology plays a critical role in the preservation, transmission, and enrichment of Indian culture by guaranteeing its accessibility to a worldwide audience. The sharing of customs, rituals, and folklore is made easier by platforms like social

media and online discussion boards, which promote cross-cultural dialogue and understanding. By using immersive ways to engage with India's many traditions, languages, and art forms, educational apps and virtual reality experiences help bridge gaps in geography and generational perspectives. Also, to ensure the legacy of old literature and endangered languages for future generations, language study programs and digital libraries are helpful. Indian culture survives in the digital age, maintaining its richness while embracing innovation with the help of these innovations in technology.

1. Digitalization of Traditional Texts

The methodical process of transforming old manuscripts, scriptures, and other traditional documents into digital formats is known as the "digitalization of traditional texts." This conversion makes it possible to preserve and make available priceless intellectual and cultural treasures that could otherwise be lost or subject to physical decay. These manuscripts are carefully scanned, preserved in electronic databases, and made everlasting by cutting-edge digitalization and scanning procedures. Global knowledge transmission and the preservation of delicate materials are made easier by digitalization. Texts are frequently encoded in machine-readable formats throughout this process, making it simpler to index, search, and integrate into many digital platforms (Oppenneer, 2011). Traditional writings can withstand the test of time by embracing the digital sphere. Additionally, by making their material accessible to a wider audience, they can overcome geographical limitations and offer chances for academic research, instruction, and cross-cultural interchange.

2. Online Learning Platforms for Traditional Education

Online learning systems for traditional education reflect a paradigm change in the transmission of traditional knowledge. These platforms use information and communication technologies (ICTs) to provide courses, workshops, and educational resources based on traditional Indian wisdom. Embracing the digital sphere, these platforms cross geographical boundaries, giving a global audience access to all aspects of India's cultural legacy. They combine multimedia components, interactive modules, and expert-led workshops to provide compelling

and immersive learning experiences (Magawi, 2019). These platforms' versatility enables a variety of learning styles, allowing students to pace their education according to their preferences. As a result, while meeting the demands of a broad and widely distributed audience, online learning platforms help to preserve and revitalize conventional education, guaranteeing its continuation in the modern day.

3. Knowledge Sharing through Social Media

Social media broadens the reach of traditional knowledge, breaking down geographical barriers and democratising access to varied ideas. It is an effective instrument for cultivating a sense of cultural identity, encouraging dialogue, and ensuring that ancient wisdom remains relevant in the digital era, involving both amateurs and professionals in a global conversation (Gaál et al., 2015). Knowledge sharing on social media is a dynamic process in which individuals and groups distribute, exchange, and discuss traditional Indian knowledge across several internet channels. Using the participatory element of social media, users can contribute thoughts, articles, films, and information about cultural practices, historical viewpoints, and traditional wisdom. These social media sites—such as Facebook, Instagram, and Twitter—promote online communities focused on particular fields of conventional wisdom (Yaqub & Alsabban, 2023). Users can engage in widespread involvement by connecting, collaborating, and contributing to the preservation of cultural heritage through hashtags, groups, and pages devoted to these themes.

4. Creation of Digital Archives

Digital archives function as all-inclusive repositories, guaranteeing the durability of priceless cultural heritage that could otherwise be lost or degraded physically. These archives make a wealth of traditional knowledge easily accessible, enabling researchers, academics, and members of the public to study and explore these materials from a distance. Archives that have been digitally digitized not only protect sensitive items but also foster cooperative efforts in knowledge preservation as organizations and communities help to grow these online databases. This procedure uses cutting-edge technologies to scan, classify, and arrange a variety of resources, such as old manuscripts, records, photos, and

artifacts (Banad, 2022). By adopting this technology strategy, digital archives ensure that India's rich cultural heritage is widely accessible, democratizing access to it and promoting the global diffusion of traditional knowledge.

5. Virtual Museums and Exhibits

Virtual displays and museums make use of technology. Users of digital platforms can investigate historical exhibits, artworks, and artifacts in a virtual environment. The displays come to life with the use of sophisticated multimedia components like audio guides, movies, and 3D models, which further improve the user experience. Virtual museums facilitate worldwide accessibility, surpassing geographical limitations and enabling people from various places to interact with India's cultural diversity. (Radwan, 2022). Through navigating virtual galleries, users can learn about traditional methods, artistic expressions, and historical circumstances. These platforms frequently include instructional elements that enhance learning by offering contextual information. Through the integration of virtual technologies, museums and exhibits play a vital role in safeguarding cultural heritage, expanding its accessibility, and promoting the value of traditional knowledge in the digital era.

6. Collaborative Research Platforms

These virtual communities act as gathering places for academics, researchers, and specialists from various sectors to share knowledge and perspectives. Collaborative research platforms, which make use of digital communication tools, facilitate real-time collaboration, overcoming geographical limitations and promoting a worldwide community of researchers. Through cooperative initiatives, online forums, and shared databases, people can synergistically explore conventional knowledge (G. George et al., 2021). By including viewpoints from several fields, this collaborative method expands the scope and depth of research and advances our understanding of India's cultural legacy as a whole. These forums are essential for encouraging communication, developing creative solutions, and making sure that traditional knowledge integration and preservation are gained from the combined knowledge of an international academic community.

7. E-Health and Traditional Medicine

Within the framework of conventional medicine, e-health signifies the merging of Information and Communication Technologies (ICTs) with traditional therapeutic methods. It entails utilizing digital technologies and platforms to improve the management, delivery, and accessibility of conventional Indian medical knowledge, especially concerning Ayurvedic systems. Virtual consultations, information sharing, and tailored treatment recommendations grounded in conventional therapies are all made possible by online health platforms. Geographical limitations are eliminated when people contact traditional healers and practitioners via telemedicine (Iftikhar, 2023). These platforms also make it easier to incorporate paper medical records into computerized databases, which enhances research and healthcare coordination. When used in tandem with traditional medicine, e-health not only increases access to healthcare but also conserves and revives traditional therapeutic methods. It does this by fusing cutting-edge technology with age-old knowledge to provide a holistic approach to wellbeing.

8. Language Preservation and Translation Tools

These resources cover a variety of digital solutions, such as machine translation services, web platforms, and mobile applications. They ensure the preservation of linguistic and cultural legacy by helping to digitize classic literature. By making it easier to translate traditional material into widely spoken languages, translation technologies promote cross-cultural understanding and close communication gaps. Users are actively involved in the resuscitation of their native languages using interactive language learning experiences provided by mobile apps and web platforms. Social media platforms facilitate language advocacy by giving communities a platform to share and celebrate their linguistic heritage. Technologies for automatic speech recognition (ASR) help preserve spoken knowledge in traditional languages by transcribing oral traditions (Post, 2024). By fusing technological advancement with cultural preservation initiatives, these language translation and preservation tools in the digital age are essential to guaranteeing the survival and significance of traditional Indian languages.

9. Knowledge Mapping and Ontologies

Knowledge mapping and ontologies are the organized representation and organization of traditional Indian knowledge using information and communication technologies. Knowledge mapping uses visual tools to depict linkages, connections, and hierarchies within the knowledge system, resulting in a comprehensive perspective. Ontologies, on the other hand, define concepts and their relationships in a formalized fashion, allowing for a consistent understanding of terminology across various realms of traditional knowledge. These ICT-driven initiatives improve information accessibility and interoperability, promoting a methodical framework for organizing India's rich traditional knowledge. Knowledge mapping and ontologies make it easier to retrieve and navigate traditional texts, manuscripts, and cultural resources by connecting them semantically (Hunter, 2005). This organized representation not only helps scholars conduct multidisciplinary research but also helps to preserve and disseminate traditional knowledge, ensuring that India's complex cultural history is systematically documented and made understandable in the digital era.

10. Remote Sensing and Agriculture

Remote sensing gives useful information on crop health, soil moisture, and environmental conditions, allowing farmers to make more educated decisions about irrigation, fertilization, and insect control. Remote sensing data can also help farmers discover diseases and stressors early on, allowing them to take corrective action on time (Tracextech, 2023). The technology improves precision farming operations, maximizing resource utilization and enhancing total agricultural yield. Remote sensing contributes to sustainable and resilient agriculture by giving real-time and historical data, allowing contemporary techniques to be integrated with traditional farming practices in India. The use of remote sensing technology in agriculture is consistent with the overall goal of harnessing modern tools to make informed decisions and promote agricultural sustainability.

11. Digital Platforms for Art and Culture

Digital art and culture platforms have transformed how traditional Indian cultural expressions are shown, shared, and conserved. These platforms, which include websites, mobile applications, and virtual galleries, offer a dynamic environment for artists to showcase their work to a global audience. Traditional art forms can be archived more easily via digital platforms, ensuring their recording and accessibility for future generations. Users can interact with artworks, learn about cultural contexts, and even take part in virtual events thanks to interactive elements. These mediums democratize art by breaking down geographical borders, allowing broad audiences to appreciate and comprehend India's rich cultural legacy. Social media broadens the reach of artistic activities, allowing artists to engage directly with fans and supporters (Bhaskar, 2023). The incorporation of technology not only preserves traditional art but also fosters innovation as artists experiment with new materials and styles in the digital arena. Overall, digital channels are critical to the modern-day preservation, distribution, and progress of traditional Indian art and culture.

12. Crowdsourcing for Knowledge Documentation

Crowdsourcing for knowledge documentation uses the combined wisdom of a broad online community to help preserve and expand traditional Indian knowledge. This collaborative strategy entails assigning responsibilities such as data collection, transcription, translation, and archival activities to a large group of people. Crowdsourcing systems allow people with diverse backgrounds and levels of skill to contribute to the documentation of cultural practices, historical narratives, and traditional wisdom (Hargrave, 2022). This strategy speeds up the knowledge documenting the process by utilizing crowd power and overcoming resource and expertise limits. It promotes inclusivity by allowing people from many backgrounds to contribute to the depiction of India's unique cultural heritage.

13. Blockchain for Authenticating Traditional Knowledge

Blockchain technology provides a secure and transparent foundation for verifying ancient Indian knowledge. Blockchain protects the integrity and authenticity of

traditional literature, artifacts, and cultural activities by using decentralized and tamper-proof ledgers. Each piece of traditional knowledge may be cryptographically safeguarded on the blockchain, creating an immutable record of its origin and ownership (Times, 2021). This not only prevents unauthorized changes but also establishes a traceable chain of custody. The decentralized structure of blockchain lowers the possibility of intellectual property theft and unauthorized replication, increasing faith in conventional knowledge's legitimacy. Smart contracts can encode ownership rights and permissions, allowing traditional knowledge holders to be fairly compensated. By incorporating blockchain technology into the authentication process, India's cultural history may be conserved and protected, ensuring that traditional knowledge remains a valued and appreciated asset in the digital era.

13. Mobile Applications for Skill Development

These apps provide accessible and interactive platforms for developing and perfecting a wide range of traditional crafts, arts, and trade skills. Tailored courses and lessons given via mobile devices offer consumers the freedom and convenience of learning at their own speed. These applications, which range from traditional handicrafts to agricultural methods, bridge generational divides by preserving and transmitting indigenous knowledge (Kerner, 2023). Gamification and virtual hands-on experiences boost engagement, making the learning process more immersive. Mobile apps also help to link skilled craftspeople and learners, building a community that cherishes and shares traditional knowledge. These applications use technology to revitalize traditional talents, ensuring their continuous relevance and transmission to future generations.

14. Augmented Reality (AR) for Cultural Heritage

The way traditional Indian heritage is perceived and understood is being changed by augmented reality (AR) applications for cultural heritage. Augmented reality (AR) improves visitors' engagement with historical places, artifacts, and cultural exhibitions by superimposing digital information onto the real environment. With AR glasses or smartphones, users can examine real-time extra information about artifacts or explore realistic virtual reconstructions of archaeological sites. This

technology gives consumers a dynamic and instructive experience by bridging the gap between the past and present (Lunkad, 2023). By showcasing customs, festivals, and historical occurrences, augmented reality applications help cultural organizations increase the accessibility and engagement of cultural heritage for a wider range of people. AR also helps to preserve cultural artifacts by offering virtual representations that can be accessed from anywhere in the world, decreasing actual wear and tear on sensitive things. Overall, AR applications for cultural heritage let people comprehend and appreciate India's rich history and traditions in a technologically enhanced and participatory way.

15. ICTs in Indigenous Governance

Within Indigenous groups, these technologies offer platforms for open communication, consensus-building, and democratic government. Indigenous leaders can reach a larger audience using ICTs to spread information about community projects, land management, and cultural events. E-governance technologies improve accessibility and accountability for community members by streamlining administrative procedures. ICTs also enable indigenous people to negotiate contemporary issues, protect cultural heritage, and fight for their rights while retaining their identity. ICTs support traditional Indian communities' self-determination and sustainable development in the modern digital environment through these technological interventions.

16. Digital Storytelling Platforms

Digital storytelling platforms are online environments that use multimedia elements to present and preserve traditional Indian stories, folklore, and narratives. These platforms generate immersive and compelling storytelling experiences through the use of text, graphics, audio, and video. These platforms enable storytellers to convey cultural history digitally, reaching a wider and more diverse audience via websites, apps, and social media channels. Digital storytelling not only preserves old tales but also provides new methods to portray them, making them more accessible and relatable to modern audiences. These sites frequently promote community interaction, allowing users to share their tales and viewpoints (Smeda et al., 2014). In the internet age, storytelling has evolved into a dynamic

instrument for preserving, promoting, and continuing ancient Indian narratives throughout generations.

17. AI for Preservation and Restoration

Artificial intelligence (AI) is critical to the preservation and restoration of traditional Indian artifacts, manuscripts, and cultural heritage. AI technology, such as computer vision and machine learning algorithms, allows for the automatic examination and categorization of historical things, which aids in their preservation by recognizing degradation tendencies (Das et al., 2022). AI-powered systems can help in the restoration process by digitally reconstructing damaged or deteriorated aspects of cultural items (Sinha, 2022). Furthermore, these technologies help to organize and catalogue large cultural archives, making them more accessible for research and public participation. Artificial intelligence applications streamline conservation efforts, providing a scalable and effective solution to the issues faced by India's huge cultural heritage. By merging technology and cultural preservation, AI promotes the long-term preservation of traditional knowledge and artifacts for future generations.

18. Remote Education for Rural Communities

Information and communication technologies (ICTs) are used in remote education for rural communities in India to close educational disparities and give them more authority. No matter where they live, kids in rural communities may access high-quality education thanks to digital learning resources, smartphone applications, and internet platforms (Haleem et al., 2022). Teachers can engage with students in real-time in virtual classrooms, creating a positive learning atmosphere. This strategy tackles issues about the dearth of competent educators and educational resources in rural areas. Localized e-learning modules encourage the inclusion of traditional knowledge in the curriculum, guaranteeing cultural relevance. Furthermore, distance education encourages skill development, providing individuals with practical information for improving their livelihoods. Remote learning has a transformative impact on the rural-urban educational divide and inclusive development in previously underprivileged communities by democratizing access to education.

19. Smart Heritage Cities

Smart Heritage Cities combine current technology with cultural preservation tactics to produce sustainable and technologically sophisticated urban environments that protect historical and traditional heritage. These cities use information and communication technologies (ICTs) to improve urban planning, infrastructure management, and historical conservation. Sensors, data analytics, and smart grids are examples of digital technologies that increase resource utilization, traffic flow, and overall municipal services. The merging of augmented reality (AR) and virtual reality (VR) allows inhabitants and visitors to have immersive experiences that highlight the city's rich cultural legacy. Smart Heritage Cities prioritize the preservation of historical structures, objects, and traditions, striking a balance between modern conveniences and the need to maintain and promote the city's unique identity (Soler et al., 2019). Smart technologies contribute to sustainable development, transforming these cities into innovation models that harmoniously mix technology breakthroughs with cultural heritage protection.

Conclusion

In summary, information and communication technologies (ICTs) have the potential to transform education, give people more power, and create a vibrant digital society. Through adopting new technologies and encouraging ICT education, we can build a more affluent, inclusive, and connected future for everybody. ICTs are more than just tools; they are a revolutionary link that opens doors for the treasures of Indian knowledge to reach the bright minds of the twenty-first century. ICTs are essential to the growth of a country because they promote innovation, inclusivity, and connectedness while giving people and communities unparalleled access to resources and information. By appreciating the knowledge of the past and embracing technological progress, we open the door to a future in which age-old voices resound, enhancing our lives and showing the way toward a livelier, globally interconnected society.

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Epistemic Virtues in Sustainable Corporate Social Responsibility: A Hermeneutical Perspective

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Abstract

This paper delves into a fascinating topic - Corporate Social Responsibility (CSR) and Social Engineering - through the lens of Ancient Indian wisdom. The hermeneutics methodology is harnessed to explore the Vedic literature and Kautilya's Artha Shastra, a highly regarded text on economics, politics, and the dharma that provides valuable insights into CSR that are still relevant today. The Rajadharma section discusses the duties of kings and the specifics of state administration in an orderly society, while other esteemed sages have also contributed to this discipline. The text traces the origins of CSR and social engineering to Vedic literature, which promotes minimal material accumulation, cooperation, and natural harmony. The ultimate goal of Vedic economic philosophy is widespread prosperity, and fairness, protection, and economic efficiency are critical factors for global human development as per the UNDP Sustainable Development Agenda and Vedic philosophy. We can implement a global development agenda that benefits everyone by practically integrating these lessons.One of the key takeaways from this paper is the traditional Indian approach of fostering self-awareness in leaders as the foundation of CSR. This differs from the

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Western approach, which often emphasises external elements. By upholding transparency, ethical conduct, and efficient governance, leaders can help attain CSR objectives and positively impact society.

Keywords: Corporate Social Responsibility; Social Engineering; Arthashastra; Vedic Philosophy; Culture

Introduction

Corporate Social Responsibility (CSR) involves voluntary actions taken by businesses to address social problems and benefit disadvantaged groups. It is one of three Corporate Responsibility (CR) perspectives, including Corporate Social Performance and Corporate Citizen. Corporate Social Performance relates to a company's social relations, principles of social responsibility, and policies. Corporate citizenship is a process that aims to protect individuals' economic, social, and political rights in an era when globalization is eroding the national guidance of these rights. A code of conduct has emerged as a set of rules to guide the behaviour and decisions of companies, suppliers, and business partners. This paper focuses on CSR, integrating social, environmental, and ethical responsibilities into business governance. Indian businesses are viewed as responsible components of India's ascendancy and are poised to take a leadership role in facing 21st-century challenges. Integrating CSR ensures long-term success, competitiveness, and sustainability. Businesses are critical in sustaining healthy ecosystems, social inclusiveness, ethical practices, and good governance—effective CSR results in sustainable growth and preferred products and services.

Objectives

The sole objective of this endeavour is to examine social engineering, business ethics, and corporate social responsibility (CSR) in ancient Indian literature. It aims to apply the lessons from this literature to modern-day CSR and social engineering, its challenges, and thus to promote awareness among corporate executives.

Methodology

This paper analyses ancient Indian literature using the qualitative research method of 'hermeneutics.'. By reviewing and interpreting classical texts, we aim to gain an in-depth understanding of cultural and historical value.

Why are companies engaged in CSR?

Clause 135 of the Companies Act 2013 promotes CSR consulting, transparency, and accountability. Companies adopt CSR to meet customer expectations and discharge social responsibility. Effective CSR management optimizes operations and boosts competitiveness. Contributing to social development can make products appealing and increase profitability. Although costly, the benefits outweigh the costs. India's corporate social responsibility (CSR) agenda is adapting to align with global trends, reflecting the country's commitment to social and environmental responsibility. While Western management theories have significantly impacted the world, many of these concepts have been practised in Asia for centuries. To maximize the effectiveness of management systems, it is essential to ground them in the cultural context of the country where they are practised (Sharma, 2001). As a result, communities and governments are exploring their management systems, including accounting, human resources, governance, and CSR, to ensure they align with local values and priorities. The emergence of Asian philosophical approaches related to management is a promising development that lays the foundation for a more sustainable and equitable future. Studies exploring the ancient Chinese Art of War and Confucianism in management have increased over the past two decades, indicating a promising development for sustainable and equitable management practices. In old India, management practices, including CSR, were based on Kautilya's Arthasastra. Arthashastra is a management guide by Kautilya, advisor to Chandragupta Maurya. It contains 150 chapters in 15 books, covering topics such as national security, justice administration, and economic development policies. Kautilya is often compared to Machiavelli, but this may be unfair. Kautilya emphasises self-control and proper methods for defeating enemies. Radhakrishnan (2005) elaborated on Kautilya's teachings on self-control, including the importance of conquering internal enemies.

A king can conquer external enemies by controlling one's senses, cultivating intellect, and maintaining proper behaviour. This paper highlights the limited research on management ideas from the Asian context, including Kautilya's Arthashastra, and the focus on Western management practices in India. Numerous Indian managers acquire their education from Western countries, raising concerns about accepting Asian management concepts in the West. This research paper explores the CSR teachings of Kautilya's Arthashastra and strives to bring attention to the multitude of ancient Indian texts that offer valuable perspectives on successful corporate management. Hermeneutics is a compelling research methodology widely used to interpret ancient literature and religious texts. Hermeneutics has become increasingly popular among scholars and academics in contemporary philosophy due to its unparalleled ability to analyse all texts and systems of meaning. This fascinating discipline encompasses interpreting human behaviour, language, social institutions, and ritual behaviours. It is a versatile methodology employed in various social science fields such as philosophy, religion and theology, law, sociology, and international relations. With hermeneutics, researchers can gain a deeper understanding of complex texts and systems, empowering them to make confident and informed interpretations. Kautilya wrote the Arthashastra in Sanskrit, an ancient language that influenced European and Asian languages. This text sheds light on the old system designed to manage a kingdom efficiently. The system used Sanskrit words to describe various managerial roles and departments, such as "Rajya" for organisation, "Raja" for CEO, "Amatya" for managers, "Kosh" for finances, "Danda" for management system, "Durg" for security system, and "Bal" for workforce, as explained by Muniapan & Shaikh (2007) in their research.

CSR in the Vedic Literature

The idea of Corporate Social Responsibility (CSR) in Indian philosophy is based on the concept of dharma, which means virtue. Dharma is the fundamental principle that establishes order in both social and moral contexts. The Taittiriya Upanishad asserts that speaking the truth is the foremost and most crucial virtue, followed by practising virtue. Dharma embodies truth and serves as the ultimate guide to right living and societal stability. In Sankara's commentary, Chakraborty

acknowledged that dharma holds greater significance than even the external authority of a king. The Indian ethical code of dharma combines intellectual understanding and self-realization, which can only be achieved by adhering to the eternal dharma prescribed by the Vedic literature as practical guidance in daily life.

Indian philosophy presents a constructive approach for individuals to reflect on their actions, speak the truth, and take the proper steps towards self-realization. This path leads to a stable and just society, where individuals' moral character is shaped by the law of karma, which means that present circumstances result from past actions. The philosophy emphasizes the importance of virtues (dharma) for spiritual development and self-realization. The law of karma is deeply rooted in the Indian classical philosophy of universal ethics, and it aims for objectives beyond this world, unlike the Western model of corporate social responsibility (CSR). The Vedas, a collection of Indian philosophical literature, provide fundamental knowledge of spiritualism, including God, the Soul, and our relationship with the universe, paving the way for a meaningful and fulfilling life. By embracing these concepts, we can lead a more fulfilling life and contribute positively to the world. The Rig Veda states that any transgression of moral laws will harm the cosmic order. Swami Dayananda classified this knowledge into four orders.

The text provides valuable insights into the different levels of knowledge that can help us grow and develop as individuals. By focusing on transcendental knowledge or Jnana, we can gain a deeper understanding of the absolute truth of God. This understanding can then be applied in our daily lives through obedience to instructions and developing a greater awareness of material objects' physical qualities and uses.

The next level, action or karma, encourages us to engage in righteous actions that promote self-determination and self-realization of the inner self and the social order. This can help us positively impact the world and encourage greater harmony and understanding.

The third level, worship or Upasana, encourages us to explore different means of realizing the self and God. Involving ourselves in practices that align with our

beliefs, customs, traditions, and values can cultivate a greater sense of purpose and meaning in our lives.

Finally, the fourth level of knowledge, Vigyan, provides a rich source of wisdom and insight through the Upanishads, Brahman Granthas, Smritis, Puranas, and Darshan Shastras. By exploring these texts, we can deepen our understanding of the world around us and gain valuable insights into the nature of existence. Ancient Indian philosophy emphasizes the importance of maintaining absolute balance in the cosmic order through exemplary moral practices, transcendental knowledge, and following the principles of Vedic philosophy. Prioritizing material wealth without adhering to ethics and social responsibility may result in facing the consequences of the law of karma. Unfortunately, a balanced life is often overlooked when pursuing business excellence in the modern business world.

Indian CSR Model

According to ancient Indian perspectives, business excellence is characterized by certain traits. It is worth noting whether an Indian CSR model exists. The Indian philosophy holds that the principles of Vedic and Bhagavad-Gita teachings form the foundation of business excellence. Business excellence should be devoted to the spiritualism of work, which will automatically align all other matters. A business should align with a universal order based on self-determination and self-realization. Unethical practices lead to losses, while fair profit-sharing motivates employees and encourages sustainability. Ethical practices benefit society and promote excellence.

According to Indian philosophy, business excellence is more than a business objective. The Vedic order system emphasizes adhering to the highest order to attain spiritual perfection or moksha. In business practices, individuals should follow the law of karma and uphold dharma or virtue to create a constructive and positive impact on their surroundings, promoting overall well-being. By following these principles, businesses can succeed and positively impact society, contributing to the greater good. A CSR model based on Vedic principles should prioritize self-realization, the laws of karma, appropriate measures, and a scientific approach. In the Bhagavad Gita, Sri Krishna suggests that aligning actions with values is

essential for success in any endeavor. This is a model that several successful Indian companies, such as the TATA Group, Infosys, Wipro, and Larsen and Toubro, have embraced. By prioritizing values, these companies have achieved success while maintaining their integrity.

Conclusion

This paper deeply explores the philosophy of corporate social responsibility and social engineering by drawing on the wisdom of ancient Indian texts. By thoroughly analysing Kautilya's Arthashastra and the teachings of revered sages, the authors have uncovered valuable insights highly relevant to today's corporate leaders. The Arthashastra throws light on the concept of CSR and the principles of state administration in a well-organized society. The origins of social engineering can be traced back to Vedic literature, which emphasizes the importance of peace and prosperity for all. It also emphasizes the critical role of leaders in promoting transparency, ethical behaviour, and effective governance to achieve CSR objectives. Furthermore, it highlights the importance of cultivating self-awareness in individual leaders as the foundation for CSR.

The exploration of "Social Engineering and Corporate Social Responsibility through the Lens of Epistemological and Philosophical Bases" is a valuable pursuit that can significantly enhance our understanding of the intricate relationship between businesses and society. The examination of the underlying epistemological and philosophical foundations can provide a nuanced perspective on the ethical and moral implications of corporate actions and facilitate the implementation of social engineering strategies that promote corporate social responsibility. Such knowledge can contribute towards creating a sustainable future that benefits both businesses and society, and we strongly encourage the further exploration of this area.

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Development and Effectiveness of an IKS Module in Cultivating Awareness of Indian Knowledge Systems among Teachers

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Abstract

Indian Knowledge system (IKS) is an umbrella term that encompasses various aspects related to India. The IKS has different meaning for different stakeholders. For the present study Indian means any knowledge having Indigenous source, knowledge means formal repository of knowledge available in literary source& system means structured and classified knowledge. This paper presents an experimental study aimed at evaluating the effectiveness of a module developed by the researcher to enhance the understanding and application of the Indian Knowledge System (IKS). The module is designed around four key components of IKS, focusing on the theory and practice of Yoga and the concept of Holistic development and Well-Being as perceived through the lens of Indian Knowledge Perspective. This experimental study involves the implementation of this module in a controlled setting to assess its impact on participants' knowledge acquisition & awareness about the Indian Knowledge System (IKS) specifically knowledge about theory & Practice of Yoga, Holistic development and Well-Being. The sample for the study comprises in-service teachers i.e. trainee teachers from three different colleges of education & two Universities i.e. University of Mumbai & Homi Bhabha State University (HBSU). The methodology involves true experimental design. This experimental study seeks to contribute empirical evidence supporting the potential of the devised IKS module in

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fostering a deeper comprehension of IKS principles and their applicability in contemporary contexts.

Keywords: Indian Knowledge System; Holistic Development; Well Being

Introduction

New education policy 2020 admits that the rich Indian knowledge & thought has been a guiding light for framing the policy. New education policy (NEP-2020) calls the IKS as 'knowledge of India,' i.e., that ancient knowledge contributing to modern India with regard to education, environment, health, etc. It is further recommended that IKS should be taught in the school curriculum and may be included in mathematics, astronomy, philosophy, yoga, architecture, medicine, agriculture, engineering, linguistics, literature, sports, and games, as well as in governance. Every attempt must be made to make this knowledge available at all levels of education. The policy expects that the rich heritage should not only be nurtured and preserved but also researched and enhanced and put to new use through our education system.

In the view of these expectations, the researcher developed an IKS module specifically related to the blending of theory and practice of yoga, understanding the concept of holistic development and well-being from IKS perspectives, and its coherence with modern psychology. The present paper studies the development & effectiveness of an IKS module in cultivating awareness of Indian knowledge systems among teachers.

Aim of the Study

To study the development & effectiveness of an IKS module in cultivating awareness of Indian knowledge systems among teachers.

Objectives

1. To compare the pre-test scores of the experimental group and the control group with respect to awareness of the Indian Knowledge System among teachers.

2. To compare the post-test scores of the experimental group and control group with respect to awareness of the Indian Knowledge System among teachers.
3. To compare the pre-test and post-test scores of the experimental group with respect to their awareness of the Indian Knowledge System among teachers.
4. To compare the pre-test and post-test scores of the control group with respect to their awareness of the Indian Knowledge System among teachers.
5. To study the effectiveness of the IKS Module in cultivating awareness of Indian Knowledge Systems among teachers.

Hypothesis

1. There is no significant difference in the pre-test scores of the experimental group and the control group with respect to awareness of the Indian knowledge system among teachers.
2. There is no significant difference in the post-test scores of the experimental group and the control group with respect to awareness of the Indian knowledge system among teachers.
3. There is no significant difference in the pre-test and post-test scores of the experimental group with respect to awareness of the Indian knowledge system among teachers.
4. There is no significant difference in the pre-test and post-test scores of the control group with respect to awareness of the Indian Knowledge System among teachers.
5. There is no significant difference in the effectiveness of the IKS development module in cultivating awareness of Indian Knowledge Systems among teachers.

Scope and Limitations of the Study

The present study has one experimental and one controlled group. The present experimental study was conducted on samples from three colleges of education. The colleges are located in Mumbai and suburban areas. The effectiveness of an

IKS module was experimentally studied to the extent of cultivating awareness of Indian Knowledge Systems among teachers.

Methodology of the Study

For the present study the researcher has adopted true experimental design. It is symbolically represented as follows.

R O X_1 O
R O X_2 O
where,
R represents random assignment of participants to groups.
O represents observation of the dependent variable.
X_1 represents the experimental group receiving the intervention.
X_2 represents the control group not receiving the intervention.

Sample and Sampling

The sample comprises 65 student teachers in the experimental group and 60 student teachers in the controlled group, i.e., 125 student teachers selected from three colleges of education from two different universities.

Tools used by the Researcher

1. Personal Data Sheet
2. IKS module that includes the theory and practice of yoga, the IKS concept of holistic development, well-being, and its relevance to modern psychology.
3. IKS awareness questionnaire: This questionnaire measures the level of IKS awareness among student teachers about the theory and practice of yoga and the idea of holistic development and well-being from IKS perspectives.

Testing of Hypothesis

Testing Hypothesis: 1

There is no significant difference in the pre-test scores of the experimental group and the control group with respect to awareness of the Indian knowledge system among teachers.

Table 1: Pre-test IKS awareness scores of Experimental Group and Control Group

Group	N	Mean	SD	't' ratio	Level of significance
Experimental	65	10.47	4.99	0.15	Not significant
Control	60	10.61	4.81		
for df123 't'= 2.57 at 0.01& 't'= 1.96 at 0.05					

From the above table it can be seen that for df=123 the tabulated value of 't' is 1.96 at the 0.05 level of significance. The obtained value of 't' is 0.15, which is less than the tabulated value of 't' at the 0.05 level of significance. Hence, the null hypothesis is accepted.

Conclusion

There is no significant difference in the pre-test score of the experimental group and the controlled group with respect to the awareness of the Indian knowledge system among teachers.

Discussion

There is no difference in the score obtained by the pre-test score of the experimental group and the controlled group. This indicates that at the pre-test level, the understanding of both groups regarding the knowledge and awareness of IKS was the same. The probable reason for it could be that the maturity level of both the groups was the same.

Testing Hypothesis: 2

There is no significant difference in the post-test scores of the experimental group and the control group with respect to awareness of the Indian knowledge system among teachers.

Table 2: Scores of the Post-test awareness of IKS among teachers' of Experimental Group and Control Group

Group	N	Mean	SD	't' ratio	Level of significance
Experimental	65	22.81	1.86	18.37	Significant at 0.05 level
Control	60	11.3	4.66		
for df 123 't'= 2.57 at 0.01 & 't'= 1.96 at 0.05					

From the above table it can be seen that for df=123 the tabulated value of 't' is 1.96 at the 0.05 level of significance. The obtained value of t' is 18.37, which is greater than the tabulated value of t' at the 0.05 level of significance. Hence, the null hypothesis is rejected.

Conclusion

There is a significant difference in the post-test score of the experimental group and the controlled group with respect to the awareness of the Indian knowledge system among teachers.

Discussion

There is a significant difference in the post-test score obtained by the experimental group and the controlled group. It could be because of the reason that the IKS module helped the experimental group to get more understanding of the Indian Knowledge System (IKS). The experimental group scored higher as compared to the controlled group due to more knowledge that they received through the IKS module.

Testing Hypothesis: 3

There is no significant difference in the pre-test and post-test scores of the experimental group with respect to awareness of the Indian knowledge system among teachers.

Table 3: Pre-test IKS awareness and post-test IKS awareness scores of the experimental group

Group	Teat	N	Mean	SD	't' ratio	Level of significance
Experimental	Pre	65	10.47	4.99	18.65	Significant at 0.05 level
	Post	65	22.81	1.86		
for df128 't'= 2.57 at 0.01 & 't'= 1.96 at 0.05						

From the above table it can be seen that for df= 123 the tabulated value of 't' is 1.96 at 0.05 level of significance. The obtained value of t is 18.65 which is more than the tabulated value at 0.05 level of significance. Hence, the null hypothesis is rejected.

Conclusion

There is significant difference in the pre-test and post-test score of experimental group with respect to awareness of Indian Knowledge system among teachers'.

Discussion

This shows that there is effect of IKS module prepared by the researcher**.** The IKS module helped the experimental group to understand the various aspects of IKS such as yoga theory and practice, concept of holistic development and wellbeing from IKS perspectives.

Testing Hypothesis: 4

There is no significant difference in the pre-test and post-test score of control group with respect to awareness of Indian Knowledge system among teachers'

Table 4: Pre-test and Post-test IKS Scores of Control Group

Group	Test	N	Mean	SD	't' ratio	Level of significance
Control	Pre	60	10.61	4.81	-0.78	Not Significant
	Post	60	11.3	4.66		
for df 118 't'= 2.57 at 0.01 & 't'= 1.96 at 0.05						

From the above table it can be seen that for df=118 the tabulated 't' value is 1.96 at 0.05 level of significance. The obtained value of 't' is -0.78 which is less than the tabulated value of 't' at 0.05 level of significance. Hence, the null hypothesis is accepted.

Conclusion

There is no significant difference in the pre-test and post-test score of control group with respect to awareness of Indian Knowledge system among teachers'

Discussion

The probable reason could be the controlled group did not show any interest in IKS and related aspects. The second probable reason is that the controlled group has not given any intervention or any orientation regarding various aspects of IKS.

Testing Hypothesis: 5

There is no significant difference in effectiveness of IKS development module in cultivating awareness of Indian Knowledge Systems among teachers'

Table 5: Pre-test and Post-test Effectiveness Scores of Experimental and Control Group

Group	N	Mean		SD		't' ratio		Level of Significance
		Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test	
Experimental	65	10.47	22.81	4.99	1.86	0.15	18.65	Significant at 0.05 level
Control	60	10.61	11.3	4.81	4.66			

From the above table it can be seen that for df = 123, the tabulated 't' value is 1.96 at the 0.05 level of significance. The obtained value of t' is 18.65 for the experimental group, which is more than the tabulated value at the 0.05 level of significance. The obtained value of 't' is 0.15 of the pre-test score experimental group, which is less than the tabulated value of 't' at the 0.05 level of significance.

Thus, there is a significant difference in pre-test and post-test scores of the experimental group. Hence, the hypothesis is rejected.

Conclusion

There is a significant difference in the effectiveness of the IKS development module in cultivating awareness of Indian Knowledge Systems among teachers.

Discussion

This shows that the IKS training through the module designed by the researcher was effective in creating awareness about various aspects of IKS, such as the theory and practice of yoga and understanding the holistic development and ancient concept of wellbeing.

Significance of the Study

The findings of this research will facilitate the integration of Indian Knowledge Systems (IKS) with contemporary subjects in the curriculum. The findings offer valuable guidance for educators, providing them with a framework to incorporate IKS into the school curriculum. This information equips academics with practical insights on how to effectively teach IKS alongside conventional subjects, fostering a more holistic and culturally enriched educational experience for students. Also, the effectiveness of the IKS module may be investigated with different samples such as in-service teachers, secondary and higher secondary students, samples from different geographical locations etc.

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Promotion of Languages in School Education through Pedagogical Implications of Indian Knowledge Systems

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Abstract

In the wake of the National Education Policy2020 (NEP2020), which emphasizes a holistic and multidisciplinary approach to education. There is a renewed interest in incorporating an indigenous and traditional knowledge systems into the school curriculum. This includes recognizing the significance of linguistic diversity and the role of languages as carriers of traditional knowledge. The incorporation of Indian Knowledge Systems (IKS) into language education necessitates a paradigm shift in pedagogical approaches. Traditional teaching methods need to be augmented with innovative strategies that accommodate the diverse linguistic and cultural heritage of India. Language pedagogy should not only focus on imparting linguistic skills but also serve as a mediate for transmitting traditional wisdom embedded in indigenous languages. Furthermore, the integration of digital pedagogy can play a transformative role in this process. Utilizing digital tools and platforms can enhance the accessibility of language education, making it more engaging and interactive. Digital resources can be tailored to incorporate multimedia elements that showcase the richness of IKS, fostering a dynamic learning environment that resonates with the tech-savy younger generation. The paper majorly focuses on the promotion of languages in school education, coupled with the pedagogical implications of IKS serves as a means to

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preserve and propagate the cultural and linguistic diversity of the nation. By aligning with the NEP 2020 and embracing innovative approaches such as digital pedagogy, educators can contribute to a more inclusive and culturally grounded educational experience for students, empowering them to appreciate and inherit the wealth of traditional knowledge embedded in their languages.

Keywords: Language in School Education; Indian Knowledge Systems; Language Pedagogy; National Education Policy-2020

Language is not just a means of communication; it is the vessel through which knowledge, culture, history, identity, and traditional knowledge are transmitted. The Indian subcontinent, known for its linguistic diversity, houses a myriad of languages, and each language is embedded with unique cultural nuances. In the context of school education, the promotion of languages goes beyond the acquisition of linguistic skills; it involves embracing the rich heritage and diverse knowledge systems embedded in different languages. The promotion of language in school education is a crucial aspect of preserving cultural diversity and fostering a deeper understanding of the indigenous knowledge systems. The pursuit of knowledge (Jnan), wisdom (Pragyaa), and truth (Satya) is considered in Indian thoughts and philosophy as the highest human goal (Ministry of Education [MoE], 2020). Indian Knowledge Systems (IKS) can be integrated into school education (Danino, 2023). In India, the pedagogical implications of IK play a significant role in fostering languages in school education. IKS, rooted in ancient wisdom and diverse linguistic traditions, can provide a holistic approach to language learning. These systems encompass not only linguistic limits but also cultural, historical, and philosophical aspects that contribute to a comprehensive understanding of the language. IKS also focuses on physical development, cognitive development, socio-emotional-ethical development, cultural/artistic development, and the development of communication (MoE, 2020). Significance.

Significance of Language in School Education

Language is the backbone and an integral part of education. Knowledge and language are the two sides of the same coin (Vidhya Bharati Uccha Shiksha Sansthan [VBUSS], 2021; Sardeshpande, 2020). Language plays an important role in man-making and character building (Sardeshpande, 2020). Language is a common method for expressing, communicating, and conveying thoughts (Mustapha & Argungu, 2019). Children acquires spoken language while interacting with their family members, even before they come to school. But this learning is informal and not very structured. Once the child enters the school, he/she starts learning language in a classroom situation in a planned and systematic manner. Language occupies a key position in the school curriculum. It is very important for the educational process. Language is the medium through which students engage with their school subjects, access information, express their thoughts, and communicate with others, both at school and outside. The following aspects highlight its significance in school education:

- Language is important for ascertaining aims and objectives of life and determining aims and objectives of education to be imported into society.
- Language is important for ascertaining previous knowledge of the students.
- Language is important for developing creativity and interest.
- Language is important for designing, developing, and modifying curriculum.
- Language is important for preparing lesson plans, unit plans, and developing the lesson plans in the class.
- Language is important for selecting appropriate teaching methods as per the requirements of the class.
- Language is important for communicating ideas and active participation of students in the class.
- Language is important for the guidance and counselling of the students.

Proficiency in language is not only essential for academic success but also for personal and professional growth. Language education is essential for fostering cognitive development, cultural understanding, and national identity. Effective

language education not only equips students with communication skills but also facilitates a deeper understanding of cultural contexts, promoting inclusivity and empathy.

National Education Policy 2020 and Promotion of Indian Languages

One of the fundamental principles of NEP 2020, the first education policy of the 21st century, is to promote multilingualism in teaching and learning. This policy aims to promote Indian languages from school education to the higher education system. This policy proposes, "All languages will be taught with high quality to all students; a language doesn't need to be the medium of instruction for it to be taught and learned well." There will be a lot of lively conversation and an enjoyable approach to teaching all languages. The central government and state government should recruit language teachers in all regional languages and, in particular, for all languages mentioned in the Eighth Schedule of the Constitution of India (MoE, 2020). States may also enter into bilateral agreements to hire teachers from each other and also to encourage the study of Indian languages across the country. India's languages are the most expressive, most scientific, most beautiful, and richest in the world, with a huge body of ancient as well as modern literature, film, and music written in these languages (MoE, 2020). Students need to be aware of the Indian languages in order to promote both national integration and cultural enrichment. Under the *'Ek Bharat Shrestha Bharat'* initiative, *'The Languages of India'* project/activity will promote Indian languages. NEP 2020 envisages, under the *'Ek Bharat Shrestha Bharat'* initiative, a hundred tourist destinations in the country will be identified where educational institutions will send students to study these destinations and their language, history, scientific contribution, tradition, indigenous literature, knowledge, etc. as a part of augmenting their knowledge about these areas (MoE, 2020).

National Education Policy 2020 and Indian Knowledge Systems

The IKS encompasses ancient texts, philosophical concepts, and indigenous practices that hold valuable insights into diverse fields such as science, mathematics, medicine, linguistics, etc.

The NEP 2020 recognizes India's rich and eternal knowledge history, which includes Jnan, Vignan, and Jeevan Dharshan as its guiding principles, with evolution based on experience and experiments (MoE, 2020). This policy envisions an education system rooted in Indian ethos and proposes the revision and revamping of all aspects of the educational structure to create a new system that is aligned with the aspirational goals of 21st-century education, including the promotion of Indian languages while building upon India's traditions and value systems (MoE, 2020). The NEP 2020 envisages that one way to address the challenges in language education is by integrating IKS, including tribal knowledge and indigenous & traditional modes of learning, into the educational framework. The integration of IKS into the educational framework can provide a unique approach to language pedagogy.

On the recommendation of NEP 2020, the Government of India has established an innovative cell named 'Indian Knowledge System Division' under the Ministry of Education to promote all the aspects of IKS (Indian Knowledge Systems Division [IKSD], 2020).

Pedagogical implications of Indian Knowledge Systems

Pedagogy is both an art and a science of teaching students. It refers to the theory and practice of education and how it influences the growth of the students (Sharma & Kulshreshtha, 2019). NEP 2020 proposes to evolve the pedagogies that make the language education more experiential, holistic, integrated, inquiry-driven, discovery-oriented, learner-centered, discussion-based, flexible, and, of course, enjoyable (MoE, 2020). Indian society is a treasure trove of knowledge, gained over thousands of years and manifested in the form of arts, customs, traditions, literature, architecture, language, etc. (University Grants Commission [UGC], 2022), and IKS offers a treasure trove of learning. NEP 2020 lays special emphasis on the promotion of Indian languages to remove the discontinuity in the flow of IKS by integrating IKS into curriculums at all levels of education. So, integrating IKS into the pedagogy of language education can bring about a holistic transformation. Language education that incorporates the pedagogical implications of IKS can be a rich and holistic approach. Pedagogical implications of IKS in

language education can enhance students' understanding and appreciation of both language and cultural diversity (Shastry,2023). To promote the language in school education, the following pedagogical implications of IKS can be considered:

a) **Multilingual approach**: India is known for its linguistic diversity, with numerous languages and dialects. To harness the linguistic diversity of India, a multilingual pedagogical approach should be adopted. Rather than confining education to a single language, schools can embrace a multilingual framework where students are exposed to and proficient in multiple languages. This not only enhances linguistic skills but also promotes a deeper understanding of different cultures and knowledge systems. Promoting a multilingual approach in schools can help in preserving and promoting various languages (Shastry, 2023).
b) **Holistic Approach**: IKS encompasses a holistic understanding of the world, integrating various aspects of life—physical, mental, and spiritual. Integrating these perspectives into language education provides a more comprehensive and interconnected learning experience.
c) **Sanskrit Studies**: Sanskrit is one of the ancient languages of India. It has the historical and cultural roots of many modern Indian languages. Explore the linguistic structures and grammatical intricacies of Sanskrit, which can enhance students' analytical and cognitive skills.
d) **Storytelling and Oral Tradition**: Indian cultures have a rich tradition of storytelling, fables, and allegories. Utilizing Indian literature, folklore, and traditional storytelling in language classrooms can captivate students' interest, making language learning more engaging and culturally relevant. These narratives have been a significant part of cultural transmission. Incorporating oral tradition into language education can enhance listening and speaking skills and preserve cultural nuances that are often lost in written form. These are also very helpful in imparting moral and ethical values to students.
e) **Literary Heritage**: Integrate classical Indian literature written in languages such as Sanskrit, Tamil, Pali, Hindi, etc. Students will be exposed to epics, poems, and philosophical literature that reflect India's

cultural and linguistic richness. In order to provide students a broader understanding of language as an expressive medium, discuss the linguistic intricacies and literary methods used in traditional Indian literature.

f) **Contextual Learning**: IKS plays a pivotal role in providing contextual learning (Londhe, 2023). Language learning becomes more meaningful when it is contextualized within the cultural and historical context. Incorporating IKS into language lessons provides a rich tapestry for students to explore, enabling them to connect with the language on a deeper level.

g) **Integrating Arts and Aesthetics**: Art integration is a cross-curricular pedagogical approach that utilizes various aspects and forms of art and culture (MoE, 2020). IKS emphasizes the integration of arts and aesthetics in learning. Incorporating music, dance, drama, and visual arts into language education can make the learning process more enjoyable and effective. Language learners can engage in creative expressions like poetry writing, calligraphy, or traditional art forms to enhance language skills. This art-integrated approach will strengthen the linkage between education and culture.

h) **Experiential Learning**: Traditional Indian pedagogical methods often involve experiential learning, where students actively participate in the learning process (Murthy, 2023). This can be applied to language education through various activities and hands-on experiences, such as role-playing, field trips, cultural exchanges, interactive projects, and interactions with native speakers. These can provide real-world language experiences to the students.

i) **Interdisciplinary Learning**: Linking language education with other subjects like history, geography, economics, philosophy, and arts such as dance, music, and drama, as well as scientific principles from ancient Indian texts, can create an interdisciplinary learning experience and enhance the overall education experience. World-class institutions of ancient India, such as Takshashila, Vikramshila, Nalanda, and Vallabhi, set the highest standards of interdisciplinary and multidisciplinary teaching and research in the country (MoE, 2020).

j) **Incorporate Yoga and Meditation**: Yoga and meditation are integral parts of IKS. The integration of the elements of yoga and meditation into language education can enhance concentration, memory, and overall well-being, contributing positivity to language learning.
k) **Modern Application**: Relate traditional knowledge systems to contemporary issues. Discuss how linguistic principles from ancient texts can be applied in modern contexts, fostering a sense of continuity and relevance.
l) **Community Engagement**: Encourage community engagement by involving local language experts and cultural practitioners. This can provide students with practical insights and a deeper connection to the living aspect of language.
m) **Integration of Modern Technology**: While drawing from traditional pedagogies, language education can leverage modern technology for interactive and immersive learning experiences. Virtual platforms, language apps, and online resources can complement traditional methods (Murthy, 2023).

By incorporating these pedagogical implications of IKS, language education can become a more holistic and culturally sensitive endeavor. IKS pedagogical practices will help in developing skills such as collaboration, self-initiative, self-direction, self-discipline, teamwork, responsibility, citizenship, etc. (MoE, 2020). It will prepare students not only as language speakers but also as informed global citizens.

Benefits of Pedagogical Implications of Indian Knowledge Systems

Promoting languages through the pedagogical implication of IKS can offer several benefits. IKS have a rich cultural and historical foundation, and integrating them into language education can enhance the overall learning experiences. Here are some potential benefits:

a) **Cognitive Development**: Pedagogical approaches rooted in IKS can enhance students' cognitive skills, including critical thinking, problem-solving, and creativity.

b) **Linguistic Competence**: Promoting multilingualism through the integration of IKS can improve students' linguistic competence, enabling them to communicate effectively in various contexts (Shastry, 2023).
c) **Linguistic Diversity**: As we know, India is home to a vast linguistic diversity. Through the pedagogical implication of IKS into language education, we can preserve and promote regional languages that contribute to linguistic diversity and language preservation efforts (Shastry, 2023).
d) **Holistic Learning**: IKS often emphasize a holistic approach to education, including physical, mental, and spiritual aspects. Integrating these principles can contribute to a more comprehensive and well-rounded learning experience. This will produce holistic and well-rounded individuals equipped with the key 21st-century skills (Londhe, 2023).
e) **Relevance to Everyday Life**: By connecting language learning to everyday life through cultural and contextual integration, students are more likely to see the practical relevance of languages they are learning.
f) **Values and Ethics**: IKS is not just based on scientific principles but also deals with ethics (Tanwa, 2023). Integrating IKS into language education can help in developing a sense of ethical responsibility and social awareness among students.
g) **Preservation of Traditional Knowledge**: Like any other civilization in the world, we also have a rich history of cultivating knowledge (Banerjee, 2022). Presently, many traditional Indian practices and knowledge are at risk of being lost. Integrating them into language education contributes to their preservation for future generations.
h) **Cultural Preservation**: Each language in India carries with it a distinct cultural heritage. The literature, folklore, and oral traditions embedded in these languages are the threads that weave the fabric of Indian culture. In school education, it is imperative to recognize the importance of preserving and promoting this cultural aspect through the medium of language. Integrating the cultural context into language teaching fosters a deeper understanding and appreciation of the diversity that defines India. The preservation of indigenous language contributes to the conservation of cultural heritage.

i) **Cultural Enrichment**: Integrating IKS into language education helps students to connect with their cultural heritage. It fosters an appreciation for the diverse traditions, philosophies, and art forms embedded in Indian languages.

j) **Cultural Sensitivity and Inclusivity**: A focus on regional languages and their cultural elements promotes inclusivity. Students, from various linguistic backgrounds, develop a greater appreciation for diversity and a sense of pride in their cultural heritage.

k) Global Perspective: Learning about IKS provides students with a global perspective on different ways of thinking and approaching problems. This broader perspective can be valuable in an increasingly interconnected world.

Conclusion

In conclusion, the promotion of languages in school education through the pedagogical implications rooted in Indian Knowledge Systems (IKS) is a multifaceted endeavor. It involves recognizing the cultural heritage embedded in languages, integrating diverse knowledge systems into pedagogy, adopting a multilingual approach, leveraging technology, and addressing challenges to ensure inclusivity. It is a step towards a more inclusive, culturally rich, and effective education system, fostering holistic development in students. By embracing this comprehensive approach, India can not only preserve its linguistic diversity but also empower the younger generation with a deep understanding of its rich cultural and scientific heritage. The journey towards promoting languages in school education is not just about learning words and grammar; it is a journey into the heart and soul of a nation.

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Integrating Indian Knowledge for Holistic Development

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Abstract

Education is the process of learning or the acquisition of knowledge, skills, values, beliefs, and habits that shape a child into a good human being. Presently education is focused mostly on the intellectual growth of children, sidelining their holistic development and physical, mental, and spiritual well-being. The teacher-learner relationship plays an important role in shaping the students into good human beings. With the development of science and technology, education has become more about imparting professional skills and ignores holistic development.

The Indian knowledge system strongly emphasizes holistic development, incorporating arts, sports, and extracurricular activities into the educational fabric. Through this combination, students are certain to develop a skill set that goes beyond academic brilliance. The system's focus on creativity and critical thinking equips students with the tools to navigate diverse challenges, fostering a mindset beyond rote learning. Students who receive this nurturing are academically successful and have the creativity and analytical abilities needed to succeed in a world that is always changing. The goal of holistic development is to involve students in the process of teaching and learning while promoting individual and group accountability.

It has been recognized that it is important to impart ancient knowledge in today's educational system because there is a list of things that are not addressed in the modern education system. The content of today's school

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education in India in all aspects is mostly based on modern culture. Nowadays, most of a student's time is spent doing academics and leisure activities, with limited time left for physical activities. To achieve the activity level, students can do simple things at home and school, such as yoga. Hence, it is important to inculcate traditional ways for improving physical fitness.

Keywords: Indian Knowledge System (IKS); Holistic Development; Gurukula, Vedas

Introduction

India in antiquity was rich and thriving in every way. Thus, invaders have repeatedly assaulted and pillaged India. Because India in antiquity was rich and thriving in every way. Thus, invaders have repeatedly assaulted and pillaged India. Because of this, India has frequently experienced financial stagnation but never had a decline in morals, knowledge, or education. The harsh reality that armaments alone could not be used to fully occupy India was realized by the British rulers. They thus abandoned their weapons and began the war of knowledge. After realizing they could not compete with India, they attempted to manipulate the Indian educational system. Thus, the British introduced the "Macaulay Minute" in 1835, characterizing education in the East as "impure and corrupt." The idea was to establish an Indian class that was entirely Western-minded in all facets of intellect, mentality, and culture, despite being Indians by blood. But to a significant measure, they succeed. Therefore, it is still common to observe that individuals with advanced degrees are embarrassed to adhere to their cultural norms. However, Macaulay's minutes, which were implemented around 200 years ago, are not to blame for it at this time. However, the prior Indian knowledge system was overwhelmingly supportive of holistic growth.

What is Holistic Development?

A comprehensive educational approach, holistic development seeks to help children develop their physical, intellectual, emotional, cognitive, and social skills.

It aims to improve these abilities at a young age, better equipping kids to handle the obstacles and challenges of everyday life later. These abilities also seem to be essential for building a strong and well-rounded personality, as well as for success in the workplace.

- **Development of Physical Capability:** This includes the improvement of fine and gross motor abilities. Examples of physical abilities are running, balancing, drawing, and so forth.
- **Development of Intellectual Capacity and Cognitive Ability:** This process entails learning and understanding via observation and experience. Intellectual and cognitive capacities include things like the capacity for problem-solving, critical thinking, creative thinking, and logical and analytical reasoning.
- **Development of emotional intelligence:** This entails learning constructive ways to communicate feelings. Emotional skills include interpersonal skills, empathy, social competence, and emotional self-control.
- **Development of social skills:** This area of study focuses on how children interact with others and communicate in their environment. Social skills include things like empathy, relationship-building, leadership, cooperation, and communication.

Why Holistic Development?

Unlike traditional schooling, holistic development places more emphasis on a child's whole development. Academic performance and the child's personality development are valued equally. Early childhood education should emphasize holistic learning since

- It helps children reach their full potential and expands their perspective and thinking. It also helps them grow in self-confidence.
- It enables children to understand more complicated concepts and apply several abilities at once.

- It helps children develop and apply analytical and problem-solving skills in the classroom. By using experiential learning strategies, it motivates and inspires children to acquire and comprehend a variety of topics.

Thus, we can conclude that preparing children for a world that is changing all the time requires comprehensive development. In addition to grades, the modern job market considers a candidate's ability to adapt and thrive in the role, as well as their personality qualities and other skills.

Indian Education System

Kautilya states that education should strive for the following three goals in graduates: वित्यणता - Generation of New Knowledge; विवेक - Intelligence to Apply Correct Knowledge at an Appropriate Time and Place for Appropriate Purposes; and विचक्षणता - The Aptitudes to Acquire the Correct Knowledge in Real Life. Only when the education system is appropriately balanced and information and skills are integrated appropriately can these aims be achieved. The modern education system needs to skillfully introduce new skill sets to tackle this challenging situation. Not only are technological skills crucial, but life skills—the ability to apply knowledge in everyday situations—are equally vital. The process of knowledge generation has been harmed by disproportionate skill in education. Mere knowledge sans practice has taken it to death. An essential part of this delicate balancing act is ancient Indian wisdom. The integration of IKS creates a lifelong balance in Indian education.

The Gurukula system, which originated in ancient India, was a customary educational framework that stretches back thousands of years. Key components of the traditional Indian educational system include the following:

1. **Gurukula:** The Sanskrit term "Gurukula" means "the family of the teacher." In this residential educational institution, pupils resided in an ashram or hermitage with their guru. The guru served as the pupils' mentor and counsellor in addition to being an instructor.
2. **Oral Tradition:** Oral knowledge transmission was a major component of education in ancient India. The pupils learned from the guru through talks,

lectures, and recitations. The guru's lessons were assimilated and memorably retained by the students.

3. **Holistic Education:** The emphasis of the traditional Indian educational system was on holistic growth. Its goal was to support a student's mental, emotional, physical, and spiritual well-being. Students were taught morality, ethics, character development, and life skills in addition to academic courses.
4. **Curriculum:** A vast range of subjects, including Vedic scriptures, mathematics, astronomy, philosophy, grammar, logic, medicine, economics, and warfare, were included in the Gurukula curriculum. A multidisciplinary education that was well-rounded was emphasized.
5. **Tailored training:** One of the main features of the Gurukula system was tailored training. The teacher catered the instruction to each student's talents, interests, and skills. This individualized approach made it possible for the student to grow fully.
6. **Practical Learning:** Experiential and practical learning were key components of the old Indian educational system. Pupils gained knowledge from observation, ritual participation, field trips, and practical experiences. The goal of this strategy was to close the gap between theoretical understanding and its real-world application.
7. **Discipleship and the Guru-Shishya Relationship:** Mutual respect, trust, and dedication were the cornerstones of the guru-student relationship (shishyas). The disciples were supposed to serve the guru and help with his everyday tasks, since the guru was seen as a spiritual mentor.
8. **Gurudakshina:** As a thank you after completing their study, students give their guru a voluntary gift or donation known as Gurudakshina. This may take the shape of cash, priceless goods, or any kind of service the guru wanted.
9. **Promotion of Moral Values:** The ancient Indian educational system placed a strong emphasis on the development of moral values and ethical behavior in addition to academic knowledge. Virtues such as integrity, modesty, respect, self-control, and compassion were imparted to the students.

10. **Learning Continuity:** Under the Gurukula system, education was a lifetime endeavor. After finishing their official schooling, students frequently stay on to do further research or study under their guru. This made it possible to pursue knowledge continuously.

The educational system of ancient India represented a holistic approach to learning, emphasizing character development, values, and life skills in addition to academic knowledge. The Gurukula system has had a lasting influence on India's educational traditions and ideas, even if it is no longer the country's most popular educational system.

What is Indian Knowledge System (IKS)?

IKS is the entirety of Indian knowledge that has taken the form of structured ways of knowing. Indian knowledge is spread widely; it includes everything from the country's indigenous and tribal folklore to the earliest known knowledge collections, such as the Vedic literature. Sanskrit, Pali, Prakrit, and all the other original Indian languages have access to a vast body of knowledge. There hasn't been much research on this over the last few decades.

Indian knowledge is organized into the humanities, social sciences, engineering and technology, and basic sciences. The Indian Knowledge System (IKS) has evolved over millennia. It covers a wide range of subjects, including astronomy, ayurveda and yoga (health and well-being), mathematics and computing, languages and linguistics, metallurgy, rasa-shastra, public administration, and military technology. Management science, among many more.

IKS has made contributions to the fields of understanding planetary movements, solar centricity, the shape and size of the globe, the properties of plants and herbs, surgical methods, and the discovery of zero and the decimal system of numbers, to name just a few.

Integrating the Indian Knowledge System and Holistic Development

The basic overview of IKS, its nature and structure, its scope and history, the integration of core IKS concepts into contemporary textbooks, and the development of Indian thought models based on existing IKS literature are all part

of the integration process. These models are then applied to various modern problem-solving techniques. Without words, there can be no knowing in others. Every knowledge is entwined with language or words.

It takes a solid foundation in language to train people to think correctly. As a result, language instruction is a crucial component of the educational system. Indian languages are vital to the IKS or IKS-based educational framework. Basic categories are understood to comprehend the IKS. Indian language terminology is used to represent these fundamental categories of any Indian knowledge system. These concepts' English translations will result in a grave misunderstanding. IKS education will become weak if Indian language instruction is discontinued. As a result, Indian education will have a sensible balance between IKS and language instruction, which will promote high-caliber research and promote peaceful economic growth. Since India has emerged as a major player in the world, integrating the IKS into higher education may draw in foreign students who are interested in learning more about the breadth and depth of Indian traditional knowledge. Gaining an understanding of IKS may help one have a more comprehensive perspective on Indian culture.

A bold move that enhances students' educational experiences, fosters cross-cultural understanding, and closes the knowledge gap between conventional wisdom and contemporary knowledge is the integration of the IKS into higher education curricula. Higher education institutions may provide a more comprehensive, diverse, and inclusive learning environment that equips students to face the challenges of the modern world with morality, wisdom, and a profound understanding of their cultural heritage by embracing IKS. Encouragement of faculty members to create and instruct these courses is necessary to help students have a deeper comprehension of the IKS. A significant step in advancing a harmonious and internationally relevant higher education system that honors the timeless wisdom of India's cultural legacy is the integration of the IKS with modern education.

Conclusion

IKS contains information about the achievements and difficulties of ancient India as well as an understanding of the country's future goals about ecology, health,

education, and every element of life. The Indian knowledge system seeks to encourage and enable more study in a number of areas, including holistic health, psychology, neuroscience, nature, the environment, and sustainable development, to address current societal problems. The Indian Knowledge System (IKS) is a cutting-edge organization that was founded to support multidisciplinary study on all facets of IKS and to conserve and distribute IKS for future study and societal uses. It will actively work to disseminate traditional wisdom and our nation's rich legacy. The IKS will cover and include mathematics, astronomy, philosophy, yoga, architecture, medicine, agriculture, engineering, linguistics, literature, sports, games, governance, polity, and conservation in addition to tribal knowledge and indigenous and traditional learning methods. This would not only encourage travel, but it will also contribute to the growth of information about different regions of the country and an awareness and appreciation of India's diversity, culture, and traditions.

Children attending schools today require more than just academic instruction. A true educational system fosters self-awareness, adaptability, cooperation, and an understanding of a child's feelings and mental impulses in addition to teaching them how to make positive, healthy human relationships. A system like this boosts student morale, enabling them to aim higher in their jobs and simultaneously evolve into valued members of society who aid in the advancement of the nation. Consequently, pupils' overall growth must begin at the start of the school year.

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Indian Knowledge System's (IKS) Perspective on Teacher and Teacher Educator Preparation

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Abstract

Indian Knowledge Systems (IKS) integration in teacher preparation programs has grown in relevance as educators acknowledge the value of cultural variety and the need for a more inclusive and comprehensive education system. This research investigates the benefits of introducing IKS into teacher and teacher educator preparation.

However, this study intends to shed light on the transformational potential of IKS in shaping competent educators and fostering culturally responsive teaching practices by examining the junction of traditional wisdom and contemporary pedagogy. Hence, the present study undertaken with three objectives, these are to identify the different sources of IKS useful for teacher education, to study the use of Indian Knowledge System (IKS) for teacher education, to give Suggestion to the concerns on the basis of the study.

For fulfilling these objectives, researchers undertaken review of related literature relevant to teaching methods, approaches, value inculcations, and knowledge imparting. It also delved into the historical evolution of teacher preparation from Ancient to Present times, covering periods such as Pre-Vedic, Vedic, Buddhist, Medieval, British Era, Independence, and Post-Independence. Based on this analysis, the study discussed the integration of IKS into educational programs. It emphasized IKS's

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potential to enhance cultural competence, teaching methods, and successful teacher preparation, underscoring the value of cultural diversity in education.

In brief this study provides insights on the incorporation of IKS in teacher preparation, emphasizing its potential to improve educational quality by encouraging cultural sensitivity, community engagement, and a holistic perspective of teaching and learning.

Keywords: Indian Knowledge System (IKS); Teacher; Teacher Educator; Teacher Preparation; Vedic Education; Medieval Education; British Era; 21st Century

Introduction

The Indian Knowledge System (IKS) aims to promote additional research addressing contemporary societal issues, and it is rooted in Vedic literature, particularly the Upanishads and Vedas. Educator training modules can be developed to enhance the quality of IKS instruction. IKS represents an organized method of knowledge transfer across generations, emphasizing the significance of texts like the Upanishads and Vedas. (Mandavkar, P. (2023).

The IKS comprises ancient wisdom encompassing traditional medicine, astrology, yoga, meditation, and more, shaping India's history and culture. Integrating these resources into education can enhance self-reflection, emotional regulation, and empathy among students, leading to improved decision-making and healthier relationships. Tiwari (2022) investigates the preparation of teachers and teacher educators through IKS. Drawing from IKS, the research explores innovative approaches to enhance teacher training programs. It examines the integration of IKS into curricula, emphasizing its potential to foster cultural competence, diversity, and holistic teaching practices. The abstract aims to contribute valuable perspectives to the discourse on teacher education and the role of Indian knowledge in shaping pedagogical strategies. Specialized teacher training centres have been established to train educators on subjects linked to IKS.

The history of validating and implementing education, the arts, administration, law, justice, health, manufacturing, and commerce has impacted Bharat's classical and other languages, transmitted through creative, oral, and literary traditions. This historical context encompasses information on ancient India's achievements, challenges, and future aspirations in areas such as health, education, environment, and all aspects of life. However, on an ancient historical background of IKS present study is undertaken with three objectives. These are:

Objectives of the Present Study

1. To identify the different sources of Indian Knowledge System (IKS) useful for teacher education.
2. To study the use of Indian Knowledge System (IKS) for teacher education.
3. To give Suggestions to the concerns on the basis of the study.

Thus, for fulfilling these objectives, following research procedure is followed.

Research Procedure

Research Method: Survey method adopted and through it Review of related Literature and Secondary Sources surved.

Collection of the Data: Secondary sources are used for the collection of the data for studying the use of IKS for the preparation of teachers and teacher educators through the lens of IKS. The data is collected through documents, books, articles, research papers, etc. From the review of related literature, the methods and approaches to teacher preparation are identified, and those are discussed under the title of the objective-wise procedure of the study.

Objective-Wise Procedure of the Study

The first objective of the study is to identify the different sources of IKS useful for teacher education, hence to fulfil this objective the review of related literature is undertaken as follows:

Barnhardt, R., & Kawagley, A. (2008)., Jacob et al. (2018). Hausknecht et al. (2021).,Tiwari, S. (2022)., Yeseraw, A., Melesse, T., & Kelkay, A. D. (2023).

This review of related literature discussed the sources of IKS. Those are in brief described in Table No.1.

Table 1: Sources of IKS Useful for Teacher Education.

Sr.no.	Different sources of IKS useful for teacher education
1.	Community elders and traditional knowledge
2.	Oral traditions and storytelling
3.	Indigenous language and Literature
4.	Indigenous community-based research
5.	Traditional ecological knowledge
6.	Indigenous Histories
7.	Indigenous arts and crafts
8.	Indigenous Traditions and Customs
9.	Local cultural centresand Museum
10.	Community events and celebrations
11.	Digital Platforms and Archives
12.	Field Experiences and Immersion Programs.

Thus, the first objective of the study is fulfilled by reviewing related literature and the second objective of the study i.e. to study the use of IKS for teacher education. For fulfilling this objective review of related literature is undertaken, Singh, B. (2023, July). Pillai, M. M. (2023, November). Chalukya, B. V. (2020, February). From this review the teacher preparation and methods/approaches, unique features, and teacher roles are identified, and those are described in Table No. 2,3,4,5.

Table 2: Ancient History (Pre-Vedic, Vedic, Post Vedic, Buddhist) of Teacher and Teacher preparedness

Establish-ment	**Method/ Approach**	**Variables**	**Unique Features**	**Teacher preparation**	**Teacher role**
Guru (Gurukul) Buddhist Education System (**Pre-history to 700 CE**)	1. Structured and revered approach 2. Rigorous training 3. Holistic and Integrated approach 4. Personalized approach 5. Systematic and comprehensive approach 6. Combining personalized learning, oral transmission of knowledge method 7. Teacher-centric approach 8. Memorize the hymns, chant, and verses contained in scriptures	1. Intellectual, moral, spiritual 2. Spiritual growth, practical skills 3. Life skills 4. Vedas 5. Practical knowledge 6. Spiritual practice and rituals 7. Aiming to cultivate a deep sense of spiritualist, compassion, wisdom	1. Students leaving their homes to live and study with their gurus, hermitage or ashram setting. 2. Development of critical thinking skills and independent thought in students enables to analyse /synthesize information effectively. 3. Teachers were selfless and dedicated to educating students based on their intelligence, rather than for monetary reason.	**Brahmacharya** (Gurukul system -forest, close to natureStudy-Vedas, scriptures, ancient text. ↓ **Grasp Knowledge** Hymns, chant rituals, sacred text, memorize ↓ **Synchronization with nature** Observing nature closely, rhythms and cycle (Celestial bodies, seasons, interplay between human and environment,	1. Impart Knowledge 2. Shape character of student 3. Uphold values of Vedic educated.

	9. Storytelling, discussion interactive learning. 10. Self-thinking		4. Teacher was carrying forward the ancient wisdom and scriptures embedded in Vedic education system. 5. The study of sacred scriptures, acquisition of pedagogical skills, and personal transformation through spiritual practice.	nature and ecological balance. ↓ **Oral Tradition** Art of recitation, chanting, precise pronunciation, intonation, rhythm, sacred text, memorize ↓ **Character Building** Honesty, Integrity, Humility, compassion, selflessness)	

From Table 2 it seems that,

1. Ancient history, spanning pre-Vedic, Vedic, and post-Vedic periods, Buddhist, saw establishment of Gurukuls. Gurukuls offered rigorous and comprehensive teacher-centric training.
2. Emphasized variables included intellectual, moral, spiritual growth, and life skills. Gurukuls uniquely required students to reside with their gurus, who imparted ancient wisdom from Vedic education.
3. Teachers underwent preparation in Gurukuls, typically situated in forest settings. Education involved studying Vedas, scriptures, and ancient texts through chanting, rituals, and memorization, observing nature and celestial bodies. Senior students of Gurukuls mentored teacher candidates.
4. The teacher's role encompassed imparting knowledge, shaping student character, and upholding Vedic values within the education system.

After studying ancient history, teacher and teacher preparedness, researcher has undertaken review of related literature of medieval period teacher and teacher educator preparedness related review of related literature and those are Momen, A., & Hossain, M. (2022). Kapur, R. (2021). Al Hasani, S. M. A. (2022). Deshmukh. L. after reviewing it, the medieval education system explored, and it is described in Table No. 3.

Table 3: Medieval Period (Pre Maurya, Maurya, Post Maurya, Pre Gupta, Gupta, Post Gupta, Delhi Sultanate, Mughals, Muslim) of Teacher and Teacher preparedness

Establishment	Method/ Approaches	Variables	Unique Features	Teacher preparation	Teacher role
1. Mughal education system 2. Islamic and Mughals system 3. Madrasah and educational institution 4. Muslim Education System 5. Female education (**700 CE to 1857 CE**)	1. Carried out through close mentorship and collaboration between teacher and students. 2. Traditional in spirit and theological content 3. Madrasahs offered both social and Islamic religious education, including teaching the Quran, Hadith and basic arithmetic.	1. Behavioural norms, cognitive pattern 2. Development of students' personalities and characteristics. 3. Focus on understanding the Islamic principles' law, social conventions.	1. Practical training exchanging knowledge and resources and continuous intellectual collaboration 2. Teacher and Student frequently lives together in continuous intellectual collaboration 3. Girls from royal families and princesses receiving education through special arrangement.	1. Engaged in a process of apprenticeship 2. Focused on teaching subject of the state, irrespective of the individual's background.	The teacher worked diligently toward the extension of knowledge, and encouraged students to utilize their education qualification skills and abilities for the betterment of themselves and community as a whole.

From Table 3 it seems that,

1. During the medieval period, education systems like the Mughal, Islamic, and Madrasahs, with a focus on Muslim Education System, including female education, emerged. Madrasahs provided social and Islamic religious teachings, along with basic arithmetic.
2. Education emphasized behavioural norms, cognitive patterns, and developing student
3. personalities, particularly in understanding Islamic principles, law, and social conventions.
4. Unique features included practical training, knowledge exchange, and intellectual collaboration. Special provisions facilitated education for girls from royal families.
5. Teacher preparation involved apprenticeship, emphasizing teaching state subjects regardless of individuals' backgrounds.
6. Teacher roles included disseminating knowledge and encouraging students to utilize their skills for personal and community development during the medieval period.

Thus, after exploring medieval period, researcher undertaken the British Era related review of related literature regarding teacher and teacher educator Preparedness those are Balwaria, R. R., & Gupta, P. (2014). Teacher Education in Pre-Independence India., Radhika Kapur, (2018)., Alam, M. A. (2022). And from review the British Era teacher and teacher preparedness information collected comprising Pre-Independence- British Education System; British Colonial Era; Independence; After-Independence- The university Education Commission appointed in 1948, The Secondary Education Commission (1952) reformed by The Ford foundation Term and The Pires committee and The Education Commission, National Policy of Education (NPE) 1986, Acharya Ramamurti Committee 1990) etc, and it is described in brief in Table No. 4

Table 4: British Era of Teacher and Teacher Preparedness

Establishment	Method/ Approach	Variables	Unique Features	Preparation of Teacher	Teacher Role
Pre-Independent (1857 to 1947) 1. European Missionaries (Danish missionaries, William Carey 2. British Education System (Teacher training colleges, Normal school, Training colleges for graduate, Elementary Teacher Training Institutes, Training colleges for men and women in Bengal, Calcutta, Bombay)	1. Knowledge through recitation, explanation, storytelling 2. Practice 3. Verbal explanation in order to general awareness, 4. Memorizing technique 5. Discussion 6. Debates 7. Imitation and repetition 8. Indigenous educational approaches used-Instructions by Brahman teacher, Maktabs, Madrasas,	1. Physical, Mental, Spiritual, Social Development, Religious teaching 2. Morality and ethics 3. Management of the household 4. Preservation of the environment 5. Taking care of health care needs and academic concepts	1. Indigenous System of education-Ashram school, maktabs, madrasas 2. Emphasizing the importance of practical training and social education. 3. Individual system of education. 4. The teachers told stories to the	1. By teaching-learning method and Instructional strategies. 2. Imitation and repetition method facilitate the transformation of scholars into teaching. Woods dispatch (1884) Established teacher training institutes. Gov. established normal school	Imparting knowledge through recitation, explanation, storytelling

	vernacular, Persian, Islamic 9. Physical education- through native game, gymnastics, school drills.	6. Improve character of textbook 7. Provide Trained staff 8. Create system of examination and scholarship 9. Improve quality of education and training for teachers.	disciplines so that they are able to adequately learn the concept. 5. During absence of the teachers, normally duties were assigned to sharp and intellectual students to teach the class.	and training colleges Madras, Bombay, Calcutta Indigenous methods of school education Brahman teacher, maktabs, madrasas, vernacular school Different method for training and recruitment teacher Apprenticeship, training in normal school	

				Disparities in teacher education (Difference in salaries and qualification)	
Post-Independent (1947 to 2000) 1. Gov. teacher training colleges (Madrasa, Bombay,Calcutta,Patna, Allahabad. 2. Practical Training School 3. District Institution of Education and Training (DIETs) 4. Colleges of Teacher Education (CTEs) Strengthening of State councils of Educational Research and Training (SCERTs)	1. Apprenticeship, Training in normal school, Training in teacher colleges, Teacher ship examination 2. Training graduates' teachers at least two subjects include -practical training- Teaching-Observation-Demonstration-Criticism of lesson plan. An internship model for teacher training to enhance teaching skills through actual field experience.	1. Flexible and adjustable courses 2. Updating content and Methodologies 3. Pre-service, In-service component Integration of subject area.	1. Continuous and inseparable nature of pre-service and In-service component of teacher education. Aimed and improve the quality of teacher education in India and uplift the national education system.	1. Training to graduates for one year, then diploma/ degree. 2. Training-Proficiency 3. Effectiveness Innovative strategies	Providing flexible and integrated subject area.

From Table 4 it seems that,

1. British Era Education encompassed Pre-colonial, colonial, and post-independence periods, with significant educational commissions and policies.
2. Educational Institutions at British era established missionary and British system schools; post-independence introduced district institutions, training schools, and teacher colleges.
3. Teaching Methods of British era emphasized recitation, storytelling, debates; post-independence focused on apprenticeship, practical teaching.
4. Emphasized Variables of British era focused on physical, mental, spiritual, social development; post-independence emphasized flexible courses, updated content, integrated subjects.
5. Teacher Education of Pre-independence used imitation, repetition; post-independence introduced one-year training with new strategies.
6. Teacher Roles of British era teachers imparted knowledge through recitation, explanation, storytelling; post-independence emphasized flexible and integrated subject teaching.

After studying the British Era regarding Teacher and Teacher Preparedness, the review of related literature undertaken to study present practices of Teacher and Teacher preparedness, those are Alam, M. A. (2022). Pilz, M., & Gengaiah, U. (2021). Tiwari, A. (2022). Singh, B. (2022). From it present scenario of Teacher and Teacher preparedness described in table: 5.

Table 5: 21st Century (2001- till date Present) of Teacher and Teacher Preparedness

Establishment	Methods/ Approach	Variables	Unique Features	Preparation of Teacher	Teacher Role
1. NEP 2020 (Four-year integrated Teacher Education Programme-ITEP) 2. Mentor councils 3. National Curriculum Framework (NCF) 4. Teacher Eligibility Test (TET) 5. National Council for the Education	1. Comprehensive and Integrated approach 2. Craft Instructor Training 3. Modular training program in 2009 to allow flexibility in choosing training institution 4. Four modules-Training methodology (TM, Engineering Technology (ET) 5. Vocational calculation and Science 6. Pedagogy and content knowledge with	1. Quality and credibility of teaching 2. Teaching principle 3. Workshop Administration 4. Use of Technology 5. Technology advancement 6. Recommending curriculum development 7. Pedagogy and assessment 8. Technical pedagogical knowledge 9. Language competent	1. Enhancement of education capabilities of future teacher and equip them with at least knowledge and pedagogical skills. 2. Focus on enhancing capacity 3. Improving access to training opportunities 4. Prioritizing the quality and excellence of teacher education 5. Teaching staff in order to stay up to date with industrial development	1. Expanding teacher training capacity. 2. Increasing access to training opportunities for females, especially in rural areas. 3. Improving the quality of teacher training programs. 4. Strengthening teacher training planning and management by the National Council for Teacher Education (NCTE). 5. Implementing a four-year Integrated Teacher	1. Effectively in shaping the future citizens for nation building 2. Encourage democratic values, 3. Guide and support students in their self-development while being a friend, 4. Facilitator in learning, 5. Judge of student performance, 6. Initiator of new teaching technologies,

of Teacher. (2021 to till date)	continuous engagement in a multidisciplinary approach. 7. Reflective practice 8. Technology integration	10. Professional approach towards teaching and learning 11. Broad multidisciplinarySubject knowledge	6. Incorporate the use of technology in both instruction and learning.	Education Programme (ITEP) to enhance the status and educational capabilities of teachers. 6. Integrating knowledge and pedagogical skills to meet the challenges of the 21st century. 7. Focusing on content, context, relevance, and perspectives of education to ensure quality and excellence.	7. Philosopher 8. Rationalist, a reducer of anxiety, 9. Upholder of human values among students

From Table 5 it seems that:

1. Educational Reforms of NEP 2020 introduces ITEP, mentor councils, NCF, TET, NCET.
2. Craft Instructor Training 2009 adopts modular program for flexibility in institution choice, trade modules, pedagogy, content knowledge.
3. Unique Features, the Focus on future teachers' capabilities, pedagogical skills, capacity-building, access to training, technology integration.
4. Teacher Preparation is done by expanding training capacity, enhancing female access in rural areas, improving program quality, ITEP, NCTE managing planning.
5. Teacher Roles are to shape future citizens, promote democratic values, use new teaching technologies, act as rationalists, reduce student anxiety, uphold human values.

Thus, the second objective of the study is fulfilled, and the third objective of the study is to give appropriate suggestions to the concerned on the basis of the current study for the preparation of the teacher and teacher educator based on a holistic and integrated approach, technology recommending curriculum development, pedagogy and assessment, language competence, a professional approach towards teaching and learning, etc. Hence, this objective is fulfilled as follows:

1. The various IKS sources, such as field trips, immersion programs, oral traditions and storytelling, Indian language and literature, Indian history, Indian arts and crafts, Indian customs, and traditions, are beneficial for teacher education.
2. Using techniques like chanting, recitation, intonation, rhythm, memory, and sacred text to prepare students for the ancient history of Gurukuls is beneficial for teaching approaches. As a result, these are employed, and teacher educators, students, and teachers themselves are taught values like integrity, humility, compassion, and selflessness through the curriculum.
3. Medieval education involved the use of storytelling by teachers to help pupils understand concepts. In the event that teachers were not available, intelligent and perceptive students were typically given the task of teaching

the class. Therefore, this IKS should be used successfully for teaching and learning. It is still employed today in the form of many cooperative teaching-learning methodologies.

4. That being said, it appears that this IKS is also employed in the procedures associated with modern education. That will carry over into the AI era as well.

Conclusion

Thus, the present study emphasizes integrating IKS into education for cultural competence. It explores teaching methods across history, including Ancient, Medieval, British era, and modern times, advocating for the inclusion of IKS in teacher preparation programs. Key sources like oral traditions, storytelling, language, arts, and immersion programs are highlighted. The study recommends incorporating diverse perspectives, such as regional concepts, to shape culturally responsive educators and stresses the importance of engaging with Indigenous communities. It contributes significant insights to teacher education and pedagogical strategies.

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Reaping Benefits from Incorporating Bharatanatyam: A Classical Dance form in the Curriculum of School and Higher Education System

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Abstract

"Bharatnatyam is a celebration of life, an ode to the divine, the ultimate expressions of the body mind and soul"

- Dr. Padma Subrahmanyam.

Human beings are differentiated from animals because they are capable of expressing their feelings and thoughts through various dimensions of communication. The mode of communication ranges from written and verbal (poetry, songs etc.), which is the most preferred method. Another way of communicating is using the body movements.

The rhythmic movements of the body used to express emotions is what we call as dance. India is a home of diverse forms of dances. India has a diverse range of folk dances that each reflects the distinctive customs and history of various regions, contributing to the country's rich cultural tapestry. One such classical form of dance is Bharatanatyam. Tamil Nadu is the birthplace of the traditional Indian dance style known as Bharatanatyam. It uses complex footwork, expressive hand gestures, face expressions, and body movements to tell tales and evoke feelings. Traditionally, the dance is performed to classical Carnatic music. Among the classical Bharatanatyam pieces are Padam, Tillana, Varnam,

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Shabdam, Jatiswaram, and Alarippu. It represents spiritual ideas and mythology from India, giving it great cultural and historical significance.

Bharatnatyam is the form which possesses the power of encapsulating the Indian mythological stories in an expressive way. It also has the potential to build a balance between the body and the mind. Additionally, the complex motions improve balance and coordination. Maintaining a healthy weight and promoting cardiovascular health are two benefits of regular practice.

This paper aims to point out the benefits occurring from incorporating the classical dance form of Bharatnatyam, on the mind and body of the students in school and higher education by simultaneously preserving the Indian dance form from near extinction, by pulling their interests from western dance forms to the Indian one, by giving them an exposure through the curriculum.

Keywords: IKS (Indian Knowledge System), folk dance, Bharatanatyam, mudra, Navarasa, curriculum, school, and higher education.

Introduction

In the heart of ancient India, a nation of diversity and great wisdom grew a knowledge system that transcended time and geography. This system, firmly steeped in spirituality, philosophy, science, and art, created a tapestry of intellectual brilliance that continues to inspire and lead generations to this day.

The Vedas, the ancient scriptures at the heart of this knowledge system, serve as its foundation. These ancient scriptures were more than just compilations of words; they were regarded as revelations, bestowed by divine energies onto enlightened sages during periods of deep concentration. The Vedas covered a broad range of topics, including cosmology, ethics, rites, and music, with each verse including a complex layer of symbolism and hidden meaning.

Among the Vedas, the Upanishads were the pinnacle of philosophical thought. These books explored the nature of reality, the self, and the world, introducing

notions like Brahman (the ultimate reality) and Atman (the individual soul). The Upanishads led seekers on a journey of self-discovery and transcendence, teaching that the substance of all existence was interrelated and bound by a common consciousness.

The Indian knowledge system also gave birth to six great schools of thought, each giving a unique perspective on reality. The Nyaya school emphasized logic and epistemology, giving a foundation for methodical reasoning and discussion. The Vaisheshika school investigated the nature of reality through an examination of atoms and their interactions. These two schools, along with the Samkhya, Yoga, Mimamsa, and Vedanta schools, established the groundwork for profound philosophical research, which continues to impact philosophical debates around the world.

India made significant and groundbreaking contributions to science. Ancient Indian mathematicians, including Aryabhata and Brahmagupta, made substantial advances in arithmetic, algebra, and geometry. Aryabhata's research into the heliocentric model of the solar system was centuries ahead of its time. The concept of zero, known as "***shunya***," arose in India and revolutionized mathematics, resulting in the creation of the decimal number system.

Medicine and the traditional healing system of Ayurveda were also an integral part of the Indian knowledge system. Sushruta, often referred to as the "Father of Surgery," is the author of the Sushruta Samhita, a comprehensive medical and surgical text. Ayurveda emphasized holistic wellness, focusing on the balance between body, mind, and spirit. Herbal remedies, dietary guidelines, and lifestyle practices were carefully documented, forming the basis of alternative medical systems still practiced today.

Art and literature thrived as articulations of the human experience inside this information framework. The Mahabharata and the Ramayana, two of the great Indian epics, were more than just stories; they were also profound reflections on morality, duty, and the essence of human nature. Writers like Kalidasa created immortal works like "Shakuntala" and "***Meghadutam***," catching the excellence of feelings and nature in smooth refrains.

The Indian knowledge system expanded its scope to include governance and ethics. Chanakya's "Arthashastra" offered insight into statecraft, economics, and political strategy. His wisdom has stood the test of time, with textual concepts still applicable to modern leadership and governance.

Perhaps the most acknowledged legacy of the Indian knowledge system is its spiritual teachings. While these traditions emphasized compassion, non-violence, and the search for inner peace as paths to liberation, the Bhagavad Gita, a portion of the Mahabharata, gave a synthesis of spiritual ideals that guided people to live purposeful and virtuous lives. The Indian knowledge system evolved over time in response to external factors. However, its essential concepts remained alive thanks to the work of researchers, gurus, and practitioners, who preserved it.

Today, the Indian knowledge system's legacy continues. Yoga and meditation, both ancient techniques, have received worldwide recognition for their physical, mental, and spiritual benefits. Indian classical music and dance continue to captivate audiences around the world, passing on the concepts of emotion and expression.

In the sphere of music and dance, Bharata Muni's Natya Shastra established the fundamentals of Indian classical music, dance, and drama. Thus, it goes beyond entertainment, focusing on the spiritual and emotional dimensions of performing arts as a means of connecting with higher states of awareness.

Bharatanatyam, a preeminent Indian classical dance style and arguably India's oldest classical dance tradition, is recognized as the mother of many other Indian classical dance forms.

Traditionally a solitary dance done only by women, it originated in Tamil Nadu Hindu temples and then spread throughout South India. The theoretical foundation of this style can be traced back to 'Natya Shastra,' an ancient Sanskrit Hindu book on the performing arts. The Devas contacted Brahma, the Creator, as Kali Yuga was about to begin, asking him to construct a Veda that Sudras could understand. Seeing that the obscure texts were becoming incomprehensible to the people, He concurred and composed the Fifth (Panchama) Veda, also known as the Natya Veda. The Natya Veda combined the teachings of the four extant Vedas: Words of

the Rig ***Veda*** called Pathya, ***YajurVeda-***abhinaya (communicative aspects of the body/mime), The ***Sama Veda-***geetham (music and chant) and ***the Atharva Veda-rasa,*** or essential mood and emotional component.

A type of illustrated narrative of Hindu religious themes and spiritual ideals expressed by dancers using great footwork and impressive gestures, its performance repertory includes ***nrita***, ***nritya***, and ***natya***. Accompanists include singers, musicians, and, most importantly, the guru who directs and conducts the event. It also continues to inspire a variety of creative genres, including paintings and sculptures, dating back to the outstanding temple sculptures of the sixth to ninth centuries CE.

According to Hindu tradition, the name of the dance form was derived by joining two words, 'Bharata' and 'Natyam,' where 'Natyam' in Sanskrit means dance and 'Bharata' is a mnemonic comprising 'bha,' 'ra,' and 'ta,' which respectively mean 'bhava,' which is emotion and feelings; 'raga,' which is melody; and 'tala,' which is rhythm. Thus, originally, the term refers to a dance form in which bhava, raga, and tala are conveyed.

The theoretical basis of this dance form, also known as Sadir, may be traced back to ancient Indian theatrologist and musicologist Bharata Muni's Sanskrit Hindu work on the performing arts, 'Natya Shastra.' The text's earliest complete form was most likely completed between 200 BCE and 200 CE, while this date can alternatively range from 500 BCE to 500 CE. According to mythology, Lord Brahma revealed Bharatanatyam to the sage Bharata, who later inscribed this holy dance form in Natya Shastra.

The book, which consists of thousands of poems organized into chapters, divides dance into two distinct forms: 'nrita,' which is pure dance consisting of delicacy in hand movements and gestures, and 'nritya,' which is solo expressive dance consisting of expressions. According to Russian academic Natalia Lidova, 'Natya Shastra' explains numerous theories of Indian classical dances, such as Tandava dance, standing positions, basic steps, bhava, rasa, acting methods, and gestures. Therefore, this paper is devoted to discussing the integration of Bharatnatyam, a classical dance form, in the curriculum of school and higher secondary education.

Through this study, the researcher tried to focus on the requirement of the restoration of the dance form of Bharatnatyam from near extinction, thereby preserving the art, and the Vedas in the Indian knowledge system are suggested in this paper, and this study is undertaken with five objectives, those are

Objectives of the Study

1. To study the role of folk dance and classical dance in education.
2. To study the role of mudras and navarasa in Bharatanatyam.
3. To study the communication role of Bharatnatyam in education.
4. To study the use of Bharatanatyam in curriculum transactions at school & higher education.
5. To give suggestions to the concerns on the basis of the study.

For fulfilling these objectives, the following research methodology is adopted for the study.

Research Methodology

The survey method is adapted, and through it, literature reviews of secondary sources are undertaken for the fulfillment of the objectives.

The first objective of the study is to study the role of folk dance and classical dance in education. For fulfilling this objective, a review of literature is undertaken as follows:

Hall, R. (1954)., Candela, M., Conte, R., Pastena, N., D'anna, C., Gomez, Paloma, F. (2013)., Susu, P. (2018)., Pathloth, V. (2018)., Singh H. & L Devi (2021)., Pattnaik, S. (2022).

From these reviews, it is found that:

1. For good communication, it is important to use body and facial movements.
2. Dancing facilitates the holistic development of a child.
3. Folk dancing contributes to the overall goal of general education.
4. A teacher with limited experience in the instruction of folk dancing can perform a satisfactory job if he/she is interested.

5. Bharateya Shastreya dance reflects Bharateya culture, heritage, mythology, history, and literature; thus it has to be educated, performed, propagated, and preserved by introducing it in the basic school education.

Thus the first objective of the study is fulfilled, and to fulfill the second objective of the study, i.e., to study the role of mudras and navarasa in Bharatanatyam, the review of literature is undertaken as follows:

Pathloth, V. (2018)., Rose, G.J.L. (2020)., Tandon, G. (2020)., Bhargava, H. (2020), Dekhane P. & Jadhav, V.G. (2021)., and Bhatia, S.S. (2023) from these reviews Asamyuta Hasta Mudras, their origin, representation, and their practical usage studied, and it is described in Table 1.

Table 1: Asamyuta Hasta Mudras, their origin and representation

Mudra Images	**Names of mudras**	**Origin**	**Representation of**
	Pataka	Lord Brahma when he went to Parabhrama& saluted him with the cry of "Victory!" he held his hand like a flag.	- Action of blessing - to point at someone/thing - to depict water , Sky, air.
	Tripataka	When lord Indra held his weapon, the vajra.	- Action of applying tilak - King or crown - Tree, lamp, Arrow, writing - Lord Indra

	Ardhapataka	Unknown	- denotes leaves , River bank , knife Horn. - to mention “both”
	Kartarimukha	When Lord Shiva set out to fight the demon Jalandhara, he drew a circle around the centre of the world with his fingertip.	When pointed downwards : - showing way - decorating the feet , crawling of the babies When pointed upwards : - biting , horn , Letters, When pointed on Both sides : - eyes , antelopes , Elephants etc.
	Mayura	Unknown	- Peacock`s neck , a creeper, a bird - vomiting, disgust - Stroking the hair - Ornament on the forehead (tilaka) - Strong waves.

	Arala	Lord Indra sent Arjun to destroy the demons Nivatakavacha, Kalakeya, and others who caused havoc in heaven. Some of them hid in the oceans, and to bring them all out, sage Agastya made this gesture to drink the seven seas and expose the demons.	- courage, pride Beauty, poise. - women gathering or scattering their hair. - wiping off sweat. - drinking poison, Nectar. - Violent winds.
	Shukatunda	Goddess Parvati has been known to utilize it in lover's quarrels with her beloved, Lord Shiva.	- to show“ don't do It “, farewell - Disgust or Disapproval. - Shooting an arrow, spear, - showing violent mood.
	Kapitta	During the churning of the seas for nectar, Lord Vishnu used this gesture to move Mandara aside.	- weapons such as Sword,bow,discus, Javelin, spear, thunderbolt, arrows, mace, spike etc. - show true and wholesome deeds. - goddess Lakshmi,Saraswati Holding lotus.

 	Katakamukha	Lord Shiva instructed Guha in archery, and he utilized this gesture. When Shiva commanded Parshuram, he utilized this gesture.	- sacrifice, umbrella, fan, mirror. - wearing garlands, arranging pearl necklace, taking out arrows, plucking flowers - A woman. - torso of a peacock
	Soochi	When Lord Brahma declared, "I am the one."	- I, me, myself. - Needle, to show Thinking, thus. - To show the sun, sound. - absolute
	Ardhachandra	To fulfil Lord Shiva's yearning for jewelry, the moon transformed into a flower and emerged as a half-moon as Shiva's adornment.	- This should indicate young trees, a crescent moon, a conch shell, a jar, a bracelet, forced opening, exertion, thinness, and drinking. - Women can use this to symbolize girdles, hips, waists, faces, and Talapatra, a type of ear jewelry and earrings.

			- This term refers to the moon phase on the eighth day of the dark fortnight, a hand gripping the throat, a spear, a plate, origin, waist, contemplating oneself, meditation, prayer, stroking the limbs, and welcoming others.
	Padmakosha	During his adoration of Lord Shiva with lotus flowers, Lord Vishnu (Narayana) used his hand to get the discus.	- To depict Bilva and Kapittha fruits and women's breasts. - signify doing Puja for a god, carrying a tribute, a casket, presenting the first funeral cake, and a quantity of little flowers. - The full-blown lotus and water-lily can be represented by two hands with fingers meeting at the wrist and twisting backward.

	Mrigashirasha	Parvati used her hand to make three lines on her brow with sacred ashes during her second penance for Shiva following the death of Madana, the God of Love.	- It is moved to symbolize here, now, "It is" today, able, shaking (ullasana), rolling the dice, wiping away perspiration, and seeming to be angry. - The term can refer to a lady, a cheek, a wheel, a limit, dread, a fight, a costume or dress, a calling, a tripundraka (drawing three lines) on the forehead, a deer's head, a lute, a massage on the feet, combining, the female organ, carrying an umbrella, walking, or calling the beloved.
	Brahmara	Kashyap used this hand to create earrings for his wife Aditi, the mother of the Devas (Gods).	- Plucking long-stemmed flowers like blue lotus and white water lily, as well as earrings. - The sound should indicate chastisement, pride in power, rapidity, beating time, and confidence. -denotes a bee, parrot, wing,crane, cuckoo.

	Shikhara	When Lord Shiva (Chandrashekhar) grasped the mountain Meru in the middle, using it as his bow.	- To depict reins, whips, goads, bows, javelins or spikes, paint the lips and feet, and raise the hairs.
	Simhamukha	Unknown	- Symbols for homa include a sacrificial fire, a hare, an elephant, waving kusa-grass, a lotus garland, a lion's face, medical preparations, and correction.
	Alapadma	Lord Krishna used this hand to take the newly created butter.	- to ask“ Who are you? , What ? or to say nonsense! - full-blown lotus, circular movement or turning,desire for the beloved, looking glass or mirror, full moon, beauty, the hair-knot, anger, a lake,and praise.

From these reviews and Table 1, it seems that:

1. Mudras were used as therapy during ancient times.
2. Mudras absorb vibrations from nature and help with a good immune system.

3. The positioning and holding of hasta mudras are compared and analyzed with a scientific approach where it is found that pronation and supination provide agility and flexibility.
4. Mudras can be adapted to meet the mental health needs of children using dance movement therapy.
5. Navarasa enhanced the emotional intelligence of the students.

Thus, the second objective of the study is fulfilled, and the third objective of the study is to study the communication role of Bharatanatyam in education; therefore, for fulfilling this objective, the review of literature is undertaken as follows:
Akas, N.C. (2016). Chakraborty, A., Moin, S.W., Dey, A., Bose, A. (n.d.).
From this review, it is found that:

1. Transmediation and semiotics are the demonstration methods used in teaching Bharatanatyam.
2. Transmediated instructions lead to critical thinking.
3. Bharatanatyam is the highest form of communication without words.

Thus, the third objective of the study is fulfilled, and to fulfill the fourth objective, i.e., to study the use of Bharatanatyam in curriculum transactions at school & higher education, the review of literature is taken as follows:
Vasuhi, R. (n.d.), K.M. Iyengar (2015).

From these reviews, it is found that:

1. Grammar & certain prose pieces in literature in English have not been attempted to be taught using Bharatanatyam.
2. An innovative tool for teaching poems.
3. Students can reiterate math's concepts through Bharatanatyam.

Thus the fourth objective of the study is fulfilled, and the fifth objective of the study is to give suggestions to the concerned on the basis of the study, and it is fulfilled as follows:

Suggestions

By using Indian Knowledge, it is essential to use dance movement therapy in schools to address mental and physical health concerns of the 21st-century generation and to improve overall well-being.

- Making Bharatanatyam available to all pupils, encouraging inclusivity, and recognizing the diversity of cultural expressions in educational settings.
- Organize seminars and provide instruction regarding the dance form bharatanatyam with the help of professional instructors. This ensures the validity and effective transmission of the art form to students.
- Encourage and organize Bharatanatyam performances for the school community. This not only demonstrates the kids' abilities, but it also instills a sense of pride in cultural heritage.
- Establish a formal certification system for Bharatanatyam to recognize students' accomplishments and encourage their commitment to the art form.
- Inculcation of any folk dance or classical dance of India in the curriculum, if made compulsory in the curriculum, would help in sustaining the art forms and help students carry it forward.

Conclusion

The incorporation of Bharatanatyam into the educational system is not only a means of maintaining a rich cultural heritage but also a holistic approach to education that promotes creativity, emotional intelligence, and general health. By embracing this classical dance form, educational institutions may help to revive and sustain an old art that has stood the test of time and continues to inspire future generations.

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Nurturing Traditions in the Age of Innovation: Redefining Teacher Roles in the Context of Indian Culture and Artificial Intelligence

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Abstract

This research endeavors to redefine the role of teachers within the unique intersection of Indian culture and the transformative landscape of Artificial Intelligence (AI). As we navigate the dynamic era marked by technological innovation, the study critically examines how educators can adapt and redefine their roles to preserve and nurture India's rich cultural traditions. The advent of AI introduces a paradigm shift, necessitating a comprehensive reassessment of the responsibilities and functions traditionally ascribed to teachers. Focused on the initiatives led by the Indian Knowledge Systems (IKS) under the Ministry of Education, the research delves into the integration of traditional knowledge with modern technologies. By synthesizing insights from teachers (n=11) interviews, interdisciplinary research, cultural studies, and educational technology, this paper provides a nuanced understanding of the evolving role of teachers. The research underscores the pivotal role of teachers in adapting to the changing educational milieu, balancing the preservation of cultural heritage with the integration of innovative AI-driven approaches. Initiatives led by IKS emerge as instrumental in successfully fusing traditional wisdom with modern technologies within the unique cultural context of India. Teachers are recognized as key agents in shaping this dynamic intersection, ensuring educational practices align with cultural

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nuances. The study emphasizes their contributions to preserving, disseminating, and innovating Indian knowledge within the intricate era of AI, contributing valuable perspectives to the ongoing discourse on the symbiotic relationship between traditional cultural heritage and the transformative influence of AI in education. The findings of this study are anticipated to inform educational policies, teacher training programs, and pedagogical approaches that align with the cultural fabric of India while embracing the possibilities offered by AI in the contemporary educational landscape.

Keywords: Indian Knowledge Systems; Teacher Roles; Indian Culture; Artificial Intelligence; Traditional Knowledge; Cultural Preservation

Introduction

The role of teachers in preserving and promoting Indian knowledge, tradition, and culture (Ahmad & Showkat, 2023) is undergoing a transformative phase in the Artificial Intelligence (AI) era. As AI permeates every facet of education, teachers find themselves at the forefront of redefining their roles and responsibilities (Zawacki-Richter et al., 2019). The profound impact of AI on teaching and learning, both in schools and higher education, necessitates an exploration of its implications for the evolving role of teachers (Popenici & Kerr, 2017). A comprehensive understanding of the narrative overview of AI trends in education is paramount for contextualizing the broader impact on educational practices and the pivotal role played by teachers (Chassignol et al., 2018). In the unique context of Indian culture, the initiatives spearheaded by the Indian Knowledge Systems (IKS) under the Ministry of Education play a pivotal role in seamlessly integrating traditional knowledge with modern technologies. These initiatives underscore the importance of acknowledging and incorporating the cultural nuances that shape teaching practices. Moreover, equipping primary and middle school teachers with awareness about neurological factors affecting learning disabilities is essential for fostering inclusive education and preserving the rich tapestry of cultural diversity (Iype et al., 2020). The evolving role of teachers in preserving, disseminating, and

innovating Indian knowledge within the framework of AI demands a nuanced understanding of AI's impact on higher education, the narrative overview of AI trends in education, and the imperative of equipping educators.

Embarking on exploring the symbiotic relationship between teachers and cultural preservation within the dynamic landscape of education (Ladson-Billings, 2014), this research delves into the crux of societal continuity. The rich historical tapestry of education in India, from the esteemed Gurukuls to the contemporary tech-driven classrooms (Joshi, 2021), underscores the enduring significance of educators. The advent of AI and the infusion of value-based studies mark a paradigm shift, prompting a reevaluation of traditional teacher roles. This study endeavours to unravel and redefine these roles within the distinctive cultural milieu of India, where AI's influence is progressively prominent. The research spotlighted the initiatives championed by the IKS under the Ministry of Education, serving as a crucible where traditional wisdom intersects with cutting-edge technologies. Particular emphasis is laid on the nuanced cultural intricacies that shape teaching practices, guiding the exploration of how educators navigate this dynamic landscape. Through a synthesis of insights derived from interdisciplinary research, cultural studies, and educational technology, this paper seeks to provide a nuanced understanding of how teachers harmonize the preservation, dissemination, and innovation of Indian knowledge within the intricate framework of AI.

Objectives of the Study

This research endeavors to unravel the intricate interplay between cultural preservation, technological advancement, and the indispensable role of teachers in shaping the future of education in India.

- To redefine the role of teachers in harmonizing traditional knowledge with AI in diverse fields.

Literature Review

The IKS initiative, instituted under the Ministry of Education, is a pioneering effort to integrate traditional knowledge with contemporary advancements (Mandavkar, 2023). With a focus on interdisciplinary research, IKS seeks to preserve and

disseminate traditional wisdom across various domains, fostering its application in modern society (Lwoga et al., 2010). The initiative spans diverse fields, including arts and literature, agriculture, basic sciences, engineering and technology, architecture, management, and economics ("Ministry of Education, 1957). At its core, the IKS initiative signifies a commitment to harmonize traditional knowledge with modern education, raising questions about the evolving role of teachers (Gratani et al., 2014). Teachers play a pivotal role in implementing and adapting IKS initiatives, so their significance is paramount (Adekannbi et al., 2014). Integrating indigenous knowledge into education is crucial for preserving cultural identity and preventing the loss of traditional wisdom (Maluleka & Ngulube, 2017). Studies highlight the practical implications of applying indigenous knowledge, particularly in enhancing food security (Masango & Mbarika, 2022).

The historical trajectory of the Indian education system, from ancient Gurukuls to contemporary tech-driven classrooms, underscores the custodial role of teachers in transmitting cultural values. In ancient educational institutions, Gurukuls were characterized by a teacher-centric approach, emphasizing holistic development and the transmission of cultural values alongside academic learning. The evolution of the Indian education system from Gurukuls to modern classrooms has seen teachers adapting to changing landscapes, balancing tradition with innovative teaching methods. Within the IKS, combining traditional Indian knowledge and modern education presents a dynamic landscape for educators. Teachers are pivotal in implementing IKS initiatives, requiring a nuanced understanding of traditional wisdom and contemporary educational paradigms. The role extends beyond conventional pedagogy, encompassing integrating traditional systems into contemporary practices, fostering cultural identity, and promoting critical thinking. Specialized training programs are essential to equip teachers for this multifaceted role (Pedro et al., 2019; UNESCO, 2019).

The confluence of traditional Indian knowledge and modern education within the IKS presents a unique landscape for educators. The evolving role of teachers necessitates a comprehensive understanding of traditional wisdom, commitment to cultural preservation, and the ability to integrate traditional knowledge into contemporary practices. Specialized training and nuanced approaches are

imperative for navigating the complexities of cultural preservation and educational innovation in the Indian context. As AI becomes integral to education globally, the infusion of AI technologies in the Indian context prompts a reevaluation of traditional teacher roles. The transformative impact of AI and value-based studies on these roles requires adaptation to changing educational landscapes while preserving the cultural essence of traditional teaching (Ahmad et al., 2023). Initiatives like IKS, which focus on integrating traditional knowledge with modern educational technologies, provide a unique context where ancient wisdom intersects with contemporary advancements, shedding light on the dynamic interplay between traditional knowledge and AI in the educational sphere (Touretzky et al., 2019). This comprehensive exploration of the roles and challenges teachers face in the context of evolving educational landscapes aims to redefine their role in harmonizing traditional knowledge with AI across diverse fields.

Methodology

This research adopts qualitative methods to comprehensively examine and redefine the role of teachers in the intersection of Indian culture and AI. In-depth interviews with experienced social science teachers (n=11) will provide qualitative insights into perceptions, challenges, and opportunities. A thorough content analysis of existing literature, educational policies, and relevant documents will offer historical and policy context. Ethical considerations, including informed consent, participant anonymity, and confidentiality, will be strictly adhered to throughout the research process.

Findings and Discussion

The findings of the study provide a nuanced understanding of the redefined role of teachers within the intersection of Indian culture and AI. Teachers universally acknowledge the importance of preserving India's cultural heritage (Dogra & Gulati, 2006). However, opinions vary on integrating AI without compromising cultural values, as evidenced by interviews conducted with teachers. In the interviews, many teachers expressed cautious optimism about leveraging AI for cultural preservation through innovative pedagogical practices. For instance,

Teacher A mentioned, *"I believe AI can be a valuable tool to make history come alive for students. We can use it to create immersive experiences that resonate with our cultural narratives."* This optimism reflects a willingness among teachers to explore AI's potential in enhancing cultural preservation. Teachers consistently highlighted challenges in balancing cultural traditions and AI-driven innovations, with concerns about potential cultural erosion amid rapid technological changes. Teacher B shared his concerns, stating, *"We want to embrace technology, but not at the cost of diluting our cultural values. It's a tightrope walk to ensure we stay true to our roots while preparing students for the future."* This sentiment was echoed by several participants, indicating a shared concern among teachers. Some teachers expressed optimism about leveraging AI for innovative pedagogical practices that contribute to cultural preservation. Teacher C stated, *"AI can help us bridge the gap between ancient wisdom and modern education. We just need to ensure it aligns with our cultural values."* These nuanced perspectives highlight the diversity of views among teachers, reflecting a spectrum of attitudes towards the role of AI in cultural preservation.

The tension between tradition and innovation emerged as a central theme in the interviews, emphasizing the need for a collaborative dialogue. Teacher D emphasized, *"We cannot ignore the march of technology, but we must navigate it carefully. Collaborative efforts are needed to develop AI tools that respect and align with our cultural values."* This call for collaboration reflects the shared recognition among teachers of the necessity to address the challenges posed by the intersection of tradition and innovation. The interview data provides concrete instances of teachers expressing cautious optimism, sharing concerns, and presenting nuanced perspectives on the integration of AI in education while preserving India's cultural heritage. The findings reveal a nuanced perspective among teachers regarding the integration of AI while preserving India's cultural heritage. However, concerns about potential cultural erosion highlight the delicate balance teachers must strike. The tension between tradition and innovation underscores the need for a collaborative dialogue between educators, policymakers, and technology developers. Strategies should be devised to ensure that AI tools align with cultural values, fostering a synergistic relationship.

The role of teachers within the IKS is multifaceted, involving responsibilities deeply rooted in the preservation and dissemination of cultural values and traditions. Teachers act as custodians of tradition, ensuring the transmission of cultural values to successive generations, instilling a sense of pride and appreciation for cultural values among their students. In the contemporary era of AI, teachers face the challenge of integrating innovative technologies into their pedagogical practices while preserving the essence of traditional knowledge systems. They must develop adaptive strategies that balance tradition with the integration of AI technologies, incorporating AI tools into the classroom in a way that aligns with the values and principles of IKS. The evolving role of teachers in the AI era also extends to fostering interdisciplinary research and societal applications within the rich tapestry of IKS. Educators are increasingly called upon to facilitate interdisciplinary learning experiences that bridge the gap between traditional knowledge systems and modern technological advancements. The National Education Policy (NEP) 2020 in India emphasizes the integration of traditional IKS into the modern education framework. The NEP recognizes the importance of teachers in facilitating this integration and highlights the need for professional development programs to equip educators with the skills and knowledge required to effectively incorporate IKS into their teaching practices. The role of teachers is characterized by their responsibilities as custodians of tradition, their adaptability in the AI era, and their contributions to interdisciplinary research and societal applications. The research sheds light on the multifaceted contributions of educators in upholding the rich heritage of IKS while embracing the opportunities presented by the AI era. Teachers play a crucial role in preserving, disseminating, and innovating Indian knowledge, particularly within the realm of AI influence.

Teachers demonstrate innovative practices in customizing AI-driven educational content to align with diverse cultural backgrounds. The findings underscore the adaptability and creativity of educators in leveraging AI as a tool for personalized and culturally sensitive learning experiences (Meng & Sumettikoon, 2022). The research findings underscore the need for supportive educational policies that recognize and address the challenges faced by teachers in navigating the complex

terrain of AI and cultural preservation. Teachers emphasize the importance of a policy framework that encourages experimentation, provides resources, and facilitates collaborative initiatives. The customization of AI-driven content by teachers showcases their adaptability and creativity. This finding emphasizes the potential of AI as a tool for personalized and culturally sensitive learning experiences (Meng & Sumettikoon, 2022). Interdisciplinary approaches adopted by teachers highlight the evolving nature of their roles. Collaborative efforts between educators, technologists, and cultural experts can contribute to the development of innovative pedagogical models. As teachers navigate the integration of AI, ethical considerations must be prioritized. The responsible use of AI tools, considering cultural sensitivity and potential biases, is paramount to ensure equitable and inclusive education. Ongoing discussions on ethical guidelines for AI in education should involve educators, researchers, and policymakers. A collective approach will contribute to the establishment of standards that align with cultural values.

Challenges and Opportunities

The integration of AI into education in India presents a dynamic landscape for teachers, who grapple with the delicate task of balancing tradition and innovation. This equilibrium is crucial for preserving cultural heritage while leveraging the benefits of technological advancements. To address this challenge, educators should consider strategies such as incorporating culturally relevant content into AI-powered educational tools and fostering a learning environment that respects and reflects cultural diversity. Moreover, embedding cultural sensitivity into AI algorithms is imperative, requiring efforts to address biases and ensure algorithms respect the diverse cultural nuances of the Indian context. Mitigating bias may involve incorporating diverse cultural perspectives in algorithm development and testing, coupled with continuous evaluation and refinement to enhance cultural sensitivity. A key element in the successful integration of AI into education is providing adequate teacher training (Pedro et al., 2019; UNESCO, 2019). Structured training programs are essential to empower educators with the skills needed to seamlessly incorporate AI into culturally responsive teaching methods (Pedro et al., 2019; UNESCO, 2019). These programs should focus on AI literacy,

culturally responsive pedagogy, and the ethical use of AI in education. Additionally, continuous professional development is crucial for educators to stay abreast of evolving technologies and pedagogical approaches (Pedro et al., 2019; UNESCO, 2019). Strategies for effective professional development may include ongoing workshops, mentorship programs, and collaborative learning communities focused on AI integration and cultural relevance in teaching methodologies. The challenges and opportunities in balancing tradition and innovation, embedding cultural sensitivity into AI algorithms, providing teacher training for AI integration, and ensuring continuous professional development are complex (Pedro et al., 2019; UNESCO, 2019) but essential for the successful integration of AI into education in the Indian context. Addressing these challenges and embracing the opportunities will contribute to a culturally responsive and technologically advanced educational landscape in India.

Future Directions and Recommendations

The exploration of the intersection between IKS, AI, and teaching practices opens avenues for extensive future research. Future research can delve deeper into how AI technologies can be culturally adapted to resonate with diverse IKS, ensuring a more inclusive educational experience (Hutson, 2023). There is a pressing need to scrutinize the ethical dimensions of AI integration in teaching, especially concerning cultural sensitivity, data privacy, and potential biases (Kumar et al., 2023). Conducting longitudinal studies to assess the long-term impact of AI-integrated teaching on student outcomes, such as academic achievements, critical thinking skills, and cultural awareness, can provide valuable insights into the efficacy of AI-enhanced education. Future research could also explore effective models for integrating AI into teacher training programs, investigating the design and implementation of specialized training modules that equip educators with the skills to effectively leverage AI tools while preserving and promoting traditional knowledge.

Policy recommendations should advocate for the development of inclusive AI education policies that address the diverse cultural landscape of India and ensure accessibility and benefits for students across socio-cultural contexts (Pedro et al.,

2019; UNESCO, 2019). Integration of traditional knowledge within the curriculum should be emphasized to complement AI-driven educational approaches and create a holistic learning environment (Dwivedi et al., 2021). To ensure the successful integration of traditional knowledge and AI in Indian education, it is crucial to consider the implications for vocational education and training (Meng & Sumettikoon, 2022). Rahm and Rahm-Skågeby (2023) emphasize the need for inclusive policies that address class struggle and competing sociomaterial and political imaginaries. Furthermore, the establishment of the Centre for Research Excellence and the International Centres for Transformational AI has been proposed in the strategy document to address the challenges and aspirations of AI in India (Chawla et al., 2022). Continuous professional development for educators is crucial, and policies should support ongoing training opportunities to keep teachers updated on AI advancements and effectively incorporate these tools into teaching practices (Stanfill & Marc, 2019; UNESCO, 2019). Policy frameworks should also include clear ethical guidelines for the use of AI in education, covering data privacy, algorithmic transparency, and the mitigation of biases to ensure responsible and culturally sensitive implementation (Köbis & Mehner, 2021; Huriye, 2023). The development of inclusive AI education policies in India requires a multidisciplinary approach that integrates traditional knowledge, addresses equity, and emphasizes continuous professional development for educators. Ethical guidelines and the involvement of relevant professionals are crucial to ensure responsible and culturally sensitive implementation of AI in education (Pedro et al., 2019; UNESCO, 2019). The evolving nature of this intersection necessitates a proactive approach to address emerging challenges and leverage opportunities for the holistic development of students and educators alike. These future directions and policy recommendations aim to guide research and influence policy frameworks, fostering the harmonious integration of traditional knowledge and AI in Indian education.

Conclusion

This research contributes valuable insights into the evolving role of teachers in India within the context of AI and cultural preservation. The findings underscore the imperative for teachers to navigate the delicate balance between tradition and

innovation, emphasizing the need for collaborative efforts to shape a holistic and culturally sensitive education system. As teachers play a pivotal role in shaping the future of education in India, this research aims to inform the ongoing discourse on educational transformation. By shedding light on how teachers navigate the complexities of tradition, culture, and AI, this research paper offers a nuanced perspective that can contribute to shaping the contemporary education landscape in India.

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Integration of Indian Knowledge Systems in Education for Holistic Development of Life Skills

Prof. Dr. Vaijayanta N. Patil*

Abstract

In an era of technological advancements and socio-economic pressures, the need for well-being and life skills to develop personality and professional competence to meet contemporary challenges has become more important than ever. On this backdrop, the integration of Indian Knowledge System (IKS) into the modern educational framework is essential to promote the development of essential life skills among learners. The purpose of the present study is to assess the potential of Indian knowledge systems in the contemporary context and to enhance life skills as defined by World Health Organization (WHO) for individual and social well-being.

By analyzing the basic principles of Indian knowledge systems, their relevance and applicability in contemporary contexts is explained. A holistic approach to these systems emphasizes the interrelationship of mind, body, and spirit and their role in enhancing emotional intelligence, resilience, and adaptability. This analysis is useful in tracking the complexities of the modern world. The analysis demonstrates the relevance and transformative potential of Indian knowledge systems in promoting life skills for individual and collective well-being. Bridging the gap between ancient wisdom and modern challenges, this analysis reveals a holistic and sustainable approach to meeting the questions, conditions and needs of the 21st century.

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The outcomes of the present study trace the possibilities of incorporating Indian knowledge systems and life skills into various levels of education and research, curriculum, co-curriculum, training, learning-teaching methods, assessment. Discusses how a meaningful integration of modern curriculum, Indian knowledge system and life skills is possible. Through this integration, creative thinking, problem-solving and socio-emotional competence and personality development can be accelerated in students. Underlines their impact on development.

Keywords: Indian Knowledge System; Life Skills; Holistic Development

Introduction

The concept of "Indian Knowledge System" encompasses a wealth of traditional wisdom, cultural insights, and practical knowledge passed down through generations via formal and informal channels. Rooted in ancient Indian philosophical schools, sciences, arts, health practices, food habits, trade, and commerce, IKS provides a comprehensive perspective on life that goes beyond the confines of conventional education. It spans diverse domains, including yoga, Ayurveda, Vedas, Upanishads, and traditional crafts. Integrating these domains into the educational system represents a transformative step toward cultivating individuals equipped with essential life skills for success in the contemporary world.

The World Health Organization (WHO) acknowledges the significance of a holistic education that emphasizes not only academic knowledge but also crucial life skills. The term "Integrated Knowledge and Skills" (IKS) refers to a comprehensive educational framework introduced by WHO to nurture students not only in academic subjects but also in essential life skills vital for personal and societal well-being. Recognizing the inadequacy of academic knowledge alone in preparing students for the complexities of the modern world, the WHO emphasizes the imperative integration of life skills into higher education to equip individuals with the tools needed for successful and fulfilling lives.

Higher education institutions play a pivotal role in shaping individuals for their future roles in society. The WHO's Life Skills set and IKS framework acknowledges that academic knowledge alone is insufficient for preparing students to navigate the complexities of the modern world. Hence, the incorporation of life skills becomes imperative in higher education to equip individuals with the tools necessary to lead successful and fulfilling lives.

Need of IKS Integration

Incorporating IKS into the education system addresses the demand for practical life skills. Traditional Indian crafts, exemplified by pottery and handloom weaving, offer a hands-on learning approach that is both culturally significant and economically viable. These crafts not only connect students with their cultural heritage but also impart practical skills applicable in various professional settings. Integrating vocational training into the curriculum enhances students' ability to navigate the complexities of the modern workforce while preserving and promoting traditional art forms.

IKS promotes an experiential and integrative learning approach, encouraging students to link theoretical knowledge with practical application. This approach fosters critical thinking, creativity, and problem-solving skills, highly valued in today's dynamic global landscape. Additionally, the incorporation of IKS into education has the potential to address mental health concerns among students. Ancient Indian practices such as meditation and mindfulness, embedded within the IKS framework, offer tools for managing stress and enhancing emotional well-being. By integrating these practices into educational routines, students can develop resilience, emotional intelligence, and heightened self-awareness, essential assets in navigating the complexities of modern life.

IKS offers a more experiential and integrative learning approach, encouraging students to connect theoretical knowledge with practical application. This can foster critical thinking, creativity, and problem-solving skills – attributes that are increasingly valued in today's rapidly changing global landscape.

The integration of IKS into education also holds the potential to address mental health concerns among students. The ancient Indian practices of meditation and mindfulness, embedded within the IKS framework, provide tools for managing stress and enhancing emotional well-being. By incorporating these practices into the daily routine of educational institutions, students can develop resilience, emotional intelligence, and a heightened sense of self-awareness, which are invaluable assets in navigating the complexities of modern life.

The principles of IKS encourage practices such as meditation and mindfulness, which have gained widespread recognition for their positive impact on emotional well-being. These practices, deeply rooted in ancient traditions, offer practical tools for individuals to navigate the complexities of their emotions, develop resilience in the face of challenges, and foster adaptability in dynamic environments. As contemporary research increasingly validates the efficacy of such practices, the integration of IKS into mainstream approaches to mental health and emotional well-being becomes not only relevant but imperative.

Relevance of IKS

The relevance of IKS extends beyond individual well-being to societal and organizational contexts. As organizations increasingly acknowledge the importance of employee well-being and resilience, IKS principles offer a holistic framework for creating conducive work environments. By incorporating practices acknowledging the interconnectedness of mind, body, and spirit, workplaces can foster a culture valuing not only productivity but also the overall health and happiness of their employees.

Resilience, a crucial facet of human thriving, is closely tied to principles embedded in Indian knowledge systems. The holistic perspective of IKS recognizes resilience not merely as the ability to bounce back from adversity but as a deeper quality stemming from a harmonious balance between mental, physical, and spiritual dimensions. Ancient wisdom, exemplified in texts like the Bhagavad Gita, provides valuable insights into building resilience through actions aligned with a higher purpose, maintaining equanimity in challenges, and understanding the transient nature of life's fluctuations.

The adaptability inherent in IKS holds paramount significance in the contemporary context. In a world marked by rapid technological advancements, socio-economic transformations, and global interconnectedness, adaptability is a prerequisite for success and fulfilment. IKS's holistic approach, emphasizing the integration of diverse aspects of human experience, provides a solid foundation for fostering adaptability. Recognizing the dynamic nature of life and the interconnectedness of all things, individuals grounded in IKS principles are better equipped to navigate change, make informed decisions, and thrive in evolving circumstances.

WHO's set of Life Skills?

The WHO has identified essential life skills integral to the IKS framework, categorized into four main domains: communication and interpersonal skills, critical and creative thinking, personal and social responsibility, and digital literacy.

Communication and interpersonal skills are fundamental in fostering effective collaboration and understanding among individuals. In a higher education setting, students need to develop the ability to express themselves clearly, listen actively, and engage in meaningful conversations. These skills not only enhance academic performance but also lay the foundation for successful personal and professional relationships.

Critical and creative thinking are crucial components of the IKS framework. Higher education should encourage students to analyze information critically, think independently, and solve problems creatively. These skills are essential for adapting to a rapidly changing world, where the ability to navigate complexity and uncertainty is paramount.

Personal and social responsibility emphasizes the importance of ethical behavior, empathy, and a sense of community. Higher education institutions should instill a strong sense of social responsibility in students, promoting values such as integrity, respect for diversity, and a commitment to making a positive impact on society. These qualities contribute to the development of responsible and ethical citizens.

Domains of Integration

Incorporating Indian knowledge systems (IKS) and life skills into education and research holds transformative potential across various levels. This integration spans curriculum design, co-curricular activities, training modules, learning-teaching methods, and assessment strategies. By exploring the possibilities and mechanisms of merging modern educational frameworks with the richness of IKS, this approach aims to establish a symbiotic relationship, enriching the academic landscape and cultivating essential life skills for holistic personality development in students.

Curriculum development is a pivotal aspect of this integration, challenging the predominantly Western-centric approach to education. IKS can offer a more inclusive and culturally relevant educational experience by weaving texts such as the Vedas, Upanishads, and classical Indian literature into existing syllabi. This not only broadens intellectual horizons, but also instills cultural pride and identity.

Co-curricular activities play a crucial role in nurturing well-rounded individuals. Incorporating elements of IKS into extracurricular programs provides opportunities for students to explore their cultural heritage through art, music, dance, and traditional crafts. These activities foster creativity, instill pride, and connect students with the rich cultural tapestry of India.

Training modules and workshops provide avenues for the incorporation of IKS and life skills. Workshops on mindfulness, meditation, and yoga, rooted in Indian traditions, enhance emotional intelligence and stress management. Practical training in traditional crafts and vocational skills equips students with valuable life skills applicable in real-world scenarios.

Learning-teaching methods are crucial in shaping students' cognitive and socio-emotional development. Integrating IKS into pedagogical approaches involves moving beyond rote memorization towards experiential and inquiry-based learning. Case studies from Indian history, philosophical debates, or scientific advancements stimulate critical thinking, while storytelling and debates centeredon

ethical dilemmas drawn from Indian literature make learning engaging and memorable.

Assessment strategies need to align with the objectives of holistic education. The integration of IKS and life skills demands a shift towards more comprehensive evaluation mechanisms, including project-based evaluations, portfolios showcasing personal and academic growth, and peer assessments. These methods foster responsibility and self-awareness.

Summary and Discussion

Exploring Indian knowledge systems (IKS) reveals enduring principles with contemporary relevance. Rooted in ancient wisdom, IKS provides a holistic approach emphasizing the interconnectedness of mind, body, and spirit. This framework enhances emotional intelligence, resilience, and adaptability, addressing the challenges of the present.

Integrating IKS into the modern educational framework is a holistic approach to preparing individuals for the contemporary world. Beyond academic excellence, this integration fosters well-being, cultural awareness, practical skills, and a mindset conducive to adaptability and innovation. As educational institutions adapt to technological disruption and socio-economic complexities, incorporating IKS guides the way to a more balanced education.

The study highlights the possibilities of incorporating IKS and life skills into various facets of education. The integration spans curriculum design, co-curricular activities, training modules, learning-teaching methods, and assessment strategies, providing a transformative educational experience. By nurturing creative thinking, problem-solving abilities, and socio-emotional competence, this approach accelerates comprehensive personality development

The WHO's Life Skills set and IKS framework for higher education represents a paradigm shift towards a more holistic and integrated approach to learning. Recognizing the importance of not only academic knowledge but also essential life skills, this framework aims to prepare students for the challenges of the modern world. The incorporation of communication and interpersonal skills, critical and

creative thinking, personal and social responsibility, and digital literacy ensures that graduates are well-rounded individuals capable of contributing meaningfully to society. Implementing the IKS framework requires a concerted effort from higher education institutions, involving curriculum redesign, faculty development, and the creation of a supportive learning environment. Ultimately, by embracing the IKS framework, higher education can fulfill its role in shaping individuals who are not only academically competent but also well-equipped to thrive in a rapidly evolving global landscape.

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