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SPECTRUM

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Spectrum is an e-magazine with the comprehensive collection of all the papers that have been published in our journal over the last two months — Volume 12, Issue 4 (July-August, 2026). This edition brings together 22 papers by 66 authors from 30 institutions. Each entry links to the abstract and the full paper.

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ABSTRACTS

1 What do our dreams mean? The Subjective Meaning of Dreams

Paper ID V12I4-1142 · Pages 1-6 · Psychology

Anahat Dhami, Student, Vasant Valley School, New Delhi

This study explores the subjective nature of "realistic dreams" among adolescents aged 15–18, focusing on how these vivid nocturnal experiences are perceived and interpreted. While much of existing dream research emphasizes physiological data like REM cycles, this paper looks at the personal side—how sensory details and emotional intensity make a dream feel indistinguishable from reality. Using a qualitative approach, detailed accounts from participants were collected via structured questionnaires to identify patterns in dream content and its connection to waking life. The findings suggest that realistic dreams are not random; they are deeply tied to the dreamer's daily stresses, relationships, and spiritual beliefs. Most notably, the data reveals that the emotional "hangover" from these dreams frequently influences a person's mood and behavior long after they wake up. By highlighting these personal narratives, the study argues that dreaming serves as a vital tool for emotional regulation and self-reflection during the formative teenage years.

Keywords: Realistic Dreams, Adolescence, Subjective Interpretation, Emotional Regulation, Qualitative Analysis, Sensory Detail

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2 Unlocking Holistic Growth: The Power of Art-Integrated Learning For Middle Schoolers

Paper ID V12I4-1138 · Pages 7-12 · Education

Komal Arora, Kundan Vidya Mandir, Ludhiana

Art-integrated learning is an inventive and constructivist approach where students illustrate, experiment, and demonstrate concepts through various art forms. This method integrates academic content—facts, ideas, concepts, processes, methods, and skill sets—into the curriculum through the lens of different art forms. Instead of teaching art as a separate subject, educators use dance, drama, music, and visual arts to teach a variety of academic subjects in a more engaging way. By integrating academic concepts with arts, classrooms can achieve 360-degree holistic learning, targeting cognitive, socio-emotional, behavioral, and psychomotor domains. This paper explores 'Arts' as a pedagogical tool and its impact on a child's overall learning and development, emphasizing the role of art-integrated learning in promoting inclusivity in the classroom. Through mixed methodology and comprehensive review of existing literature and research studies, the paper highlights the benefits of incorporating visual arts, music, drama, and other forms of creative expression into core subjects such as math, science, language arts, and social studies. The dynamic and engaging learning environment created by art integration caters to diverse learning styles and enhances academic achievement. Furthermore, the paper underscores the importance of professional development and training for educators to successfully integrate art into their lesson plans and curriculum. Collaboration between co-curricular teachers

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and subject-area teachers can foster interdisciplinary learning experiences that promote creativity, critical thinking, and academic achievement among students. The effectiveness of art-integrated learning as a strategy for holistic development is reviewed through activities initiated in the middle school section of Kundan Vidya Mandir Senior Secondary School, Ludhiana, across various curricular subjects during the 2023-2024 academic session. The findings indicate that art-integrated learning enhances student engagement, motivation, and understanding of academic subjects, fostering creativity, critical thinking, problem-solving, decision-making, and collaboration. Conclusion: With the understanding of art-integrated learning and its practical implications, we conclude that art integration provides a holistic approach to education by incorporating creativity, critical thinking, problem-solving, decision-making, and collaboration into various subjects. It not only enhances academic performance but also fosters social and emotional development, making it an essential component of a well-rounded education. It also improves interpersonal relationships, empathy, emotional management, communication skills, and adaptability to the environment. Given its benefits, the use of an art-integrated learning strategy in schools, especially for the age group of 11-13 years, is highly recommended for its effective and positive outcomes in every aspect of a student's life.

Keywords: Art integration, Learning experience, Interdisciplinary learning, Holistic development

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3 Celebration of Nature in Muruganar’s ‘Ramana Tiruvempavai’

Paper ID V12I4-1144 · Pages 13-16 · Bharatanatyam

Revathi Sankar, Research Scholar, School of Music and Fine Arts, VELS Institute of Science, Technology, and Advanced Studies (VISTAS), Chennai, Tamil Nadu
Dr. Ambika Kameshwar, Assistant Professor, School of Music and Fine Arts, VELS Institute of Science, Technology, and Advanced Studies (VISTAS), Chennai, Tamil Nadu

This paper explores the evolution of humanity’s reverence for nature. It traces how early man awed about the elemental forces, gradually changing the amusement into worship. One of the Pancha Bhoota Sthalas, the agni kshetra, Aruanchala is the central axis of spiritual devotion. It celebrates the saints and sages who have been associated with this place, Arunachala. The Tamil Poesy of Arunagirinatharm Kamban, Pamban Swamigal on Arunachala is mentioned and the poems of Muruganar Swamy in the twentieth century which are more than 30,000 verses stand as a monumental offering to Ramana Maharshi. His works are Ramana Sannidh Murai, Guru vachaka kovai and Padamalai gives us a combination of philosophical precision and devotional intensity. Nature’s splendour is also woven here and the silence of Annamalai is brought out. It is said that Muruganar’s poetry was similar to that of Manickavachagar’s poetry. Through Ramana Tiruvempavai, the classicam peace, solitude and natural beauty of Arunachala is shown vividly. It also makes us understand that music, dance and Tamil literature takes us to the Ultimate truth, rather than giving only the factor of entertainment. This transcends an individual to sacred portals of wisdom with Muruganar’s union of poetic genius, spiritual surrender and cultural continuity.

Keywords: Muruganar, Ramana Tiruvempavai, Poems, Nature, Arunachala, Ramana Maharshi, Ramana Sannidhi Murai, Peace, Solitude, Natural Splendour

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4 Ramana Pada Pancharatnam

Paper ID V12I4-1145 · Pages 17-21 · Bharatanatyam

Revathi Sankar, Research Scholar, School of Music and Fine Arts, VELS Institute of Science, Technology, and Advanced Studies (VISTAS), Chennai, Tamil Nadu
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Ramana Pada Pancharatnam lays the spiritual journey of Sivaprakasam Pillai. Pillai was the first to receive written instructions about self – enquiry from Ramana Maharshi. There were questions by Sivaprakasam Pillai and Ramana's replies to them forming the foundation to the text 'Nan Yaar' (Who am I?), a ready reckoner to all Spiritual seekers. His experiences of meeting Ramana, his guidance to him and many other instances have been documented in the works – Anugraha Ahaval, Sri Ramana Charitra Ahaval and Ramana Pada Malai. Smt. Sulochana Natarajan inspired by this work of Sivaprakasam Pillai has composed music and presented the Ramana Pada Malai similar to the lines of Thyagaraja Swamy's Pancharatna Kritis using ragas Nattai, Goula, Arabhi, Varali and Sri. The pallavi is aptly chosen as Ramanan Padam Vazhgave. The attempt to translate to Kannada has also happened here, giving the english meaning along with the verse. The text also includes stories related to the verses showing Ramana's life – his compassion towards devotees, animals, and even sinners by reminding everyone about Self enquiry and emphasising on liberating oneself from this world or the cycle of birth and death, resting in the truth of the Self.

Keywords: Ramana Pada Malai, Ramana Pada Pancharatnam, Ramana, Sivaprakasam Pillai, Self Enquiry, Self, Ramanan Padam Vazhgave

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5 Copper (II) Schiff Base Complex: Synthesis, Characterization, Enhanced Antibacterial Activity and Electrochemical Drug Detection

Paper ID V12I4-1157 · Pages 22-32 · Chemistry

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Dr. Sandip R. Kelode, Associate Professor, Department of chemistry, Arts, Commerce, and Science College, Maregaon

A novel Schiff base ligand (L), namely (E)-N-(1-(2,4,5-trimethylphenyl)ethylidene)-1H-1,2,4-triazol-3-amine, derived from a substituted phenolic precursor, and its copper(II) complex were successfully synthesized and characterized using various spectroscopic techniques, including FTIR, NMR, and elemental analysis. Spectral investigations confirmed the coordination of the ligand to the Cu(II) ion through the azomethine nitrogen and phenolic oxygen atoms, indicating bidentate chelation and the formation of a stable metal complex. The antimicrobial activity of the synthesized compounds was evaluated against Escherichia coli using the agar well diffusion method. The $Cu(L)_2$ complex exhibited significantly enhanced antibacterial activity compared to the free ligand, as evidenced by larger zones of inhibition. A concentration-dependent increase in inhibition

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diameter was observed, demonstrating improved efficacy at higher concentrations. The enhanced biological performance of the metal complex can be attributed to chelation-induced increases in lipophilicity, which facilitate better penetration through the bacterial cell membrane, along with possible metal-mediated interference in essential cellular processes. In addition to its antimicrobial properties, the $Cu(L)_2$ complex was investigated as an electrochemical sensing material for the detection of Naproxen (NPR). The modified electrode exhibited a linear response over the concentration range of 1–10 µM, demonstrating excellent sensing capability toward the target analyte. The sensor showed a sensitivity of 0.13 µA μM^{-1} and achieved a limit of detection (LOD) of 1 µM. The enhanced electrochemical performance is attributed to the redox-active Cu(II) center and the efficient electron-transfer characteristics of the Schiff base framework, which promote rapid and sensitive analyte detection.

Keywords: Schiff Base Ligand, Copper(II) Complex, Antibacterial Activity, Naproxen Sensing

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6 Pain Recognition with Physiological Signals using Hybrid Models

Paper ID V12I4-1172 · Pages 33-42 · Paper Publication

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The pain measurement is a very vital aspect of healthcare, but the traditional approaches offer extensive dependence on manual feature extracting through physiological measurements and clinical judgement. These conventional methods involve expert knowledge, they are time consuming and have a tendency to fail to be generalized effectively nor across various groups of patients. To overcome these shortcomings, this paper comes up with a proposal of an automated pain recognition model that processes physiological signals through a hybrid deep learning model. The model combines Convolutional Neural networks, Bidirectional Long short term memory networks, and Gated Recurrent Units with which hierarchical spatial and time representations of raw signals are learned automatically. The architecture captures the local signal properties as well as the long-range contextual dependencies which enhance the difference between pain and no-pain states. Further, a stacking classifier ensemble is used to improve the prediction robustness and generally improve its performance. The proposed method has a high level of reliability as experimental assessment shows that this method is accurate at the level of 99. The system offers scalable and intelligent capability of objective pain monitoring which aids in supporting the making of better clinical decisions and patient care within the contemporary healthcare settings.

Keywords: Pain Recognition, Physiological Signals, Hybrid Deep Learning, Stacking Classifier, Automated Healthcare. Systems, Smart Pain Surveillance.

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7 Strengthening Hospital Disaster Preparedness at District General Hospital Matara, Sri Lanka: A Case Study of Preparedness Assessment and Improvement Strategies

Paper ID V12I4-1164 · Pages 43-53 · Medical Administration

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Hospital disaster preparedness is essential for ensuring continuity of healthcare services and minimizing the impact of emergencies and disasters. Despite the availability of national disaster preparedness guidelines, hospitals face challenges in maintaining comprehensive and up-to-date preparedness systems. This study evaluated disaster preparedness at District General Hospital Matara, Sri Lanka, identified key operational challenges, and proposed evidence-based strategies to strengthen organizational resilience. A descriptive case study design was employed using methodological triangulation. Data were collected through document review, key informant interviews, direct observations, and assessment using a structured checklist adapted from the World Health Organization Hospital Emergency Response Checklist and national disaster preparedness guidelines. The checklist comprised 43 indicators across 12 preparedness domains. A study-specific Composite Hospital Disaster Preparedness Score (CHDPS) was developed to summarize preparedness across organizational domains. Operational challenges were prioritized using the Nominal Group Technique, and the highest-priority problem was further analysed through root cause analysis to identify underlying organizational factors. The overall CHDPS was 74.4% (64/86). The highest preparedness scores were observed in Recovery and Termination (100%), External Coordination (83.3%), Security and Access Control (83.3%), and Notification and Activation (80.0%). Lower preparedness scores were identified in Staff Mobilization and Welfare (60.0%), Triage and Patient Management (62.5%), and Debriefing and Quality Improvement (66.7%). The principal operational challenge was an outdated Hospital Disaster Preparedness and Response Plan, with root causes related to governance, organizational processes, human resources, and monitoring mechanisms. The study demonstrates that structured preparedness assessment combined with quality improvement methodologies can effectively identify institutional strengths and operational gaps. The proposed CHDPS provides a practical framework for monitoring hospital disaster preparedness and supporting continuous organizational improvement. The findings offer practical guidance for strengthening disaster preparedness and enhancing health system resilience in Sri Lanka and other comparable resource-constrained

Keywords: Disaster Preparedness, Hospital Emergency Preparedness, Hospital Disaster Management, Quality Improvement, Composite Hospital Disaster Preparedness Score (CHDPS), Hospital Resilience, Sri Lanka

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8 Automated Video Generation using Deep Learning

Paper ID V12I4-1173 · Pages 54-66 · Artificial Intelligence

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The increasing utilization of multimedia content in education, marketing, and digital communication has created a growing demand for efficient video generation systems. This paper presents an Automated Video Generator that converts textual input into narrated videos using a modular deep learning-based pipeline. The proposed system generates a narrative, retrieves context-relevant images, synthesizes speech using text-to-speech technology, and composes synchronized videos through a web-based Django framework. Experimental results demonstrate improved efficiency, stable performance, and audio-visual synchronization, making the system suitable for educators, marketers, and content creators while reducing manual effort and production time. ``` Batch11 Automated Video Generator Using Deep Learning.pdf

Keywords: Automated Video Generation, Deep Learning, Text-to-Speech (TTS), Natural Language Processing (NLP), Multimedia Content Generation.

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9 Examination Integrity in India: Analysing the Role of Political Influence, Governance Deficits, and Institutional Weaknesses in Examination Paper Leaks

Paper ID V12I4-1176 · Pages 67-77 · Education System Of India

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India has one of the world's oldest and largest education systems, where competitive examinations and board assessments play a crucial role in determining academic and career opportunities. However, examination paper leaks, cheating, and the re-conduct of exams undermine the credibility of the education system, affecting deserving aspirants' time, effort, and morale. This study examines how political influence, governance deficits, corruption, and institutional weaknesses contribute to breaches of examination integrity. METHODOLOGY: This study adopts a descriptive and analytical research design based on both primary and secondary sources of data. Primary data were collected through a structured questionnaire administered through Google Forms, with responses from 80 participants. Approximately 62% of respondents were school students, 17–18% were college students from institutions across Delhi NCR, while the remaining participants comprised working professionals from various sectors. Secondary data were collected from government reports, official documents, news articles, policy papers, and published research studies to provide contextual understanding and validate primary findings. RESULT: The findings reveal that most respondents consider examination paper leaks a serious threat to fairness and merit. They identified political influence, corruption, and weak governance as key factors contributing to these incidents. Secondary data further indicate that paper leaks affect millions of candidates, increase public expenditure due to re-conducted examinations, and weaken public trust in the

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examination system. CONCLUSION: The study concludes that examination paper leaks are not only educational failures but also governance challenges arising from corruption, weak accountability, and institutional shortcomings. Strengthening examination security, transparency, and institutional accountability is essential to safeguard meritocracy, restore public confidence, and protect the integrity of India's education system.

Keywords: Examination Integrity, Examination Paper Leaks, Political Influence, Governance Deficits, Corruption, Institutional Weaknesses, Examination Malpractice; Public Trust, Accountability, Meritocracy, Examination Security, India

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10 Socio-economic Determinants of Livelihood Security among Street Vendors: Evidence from Paramathi Velur Taluk

Paper ID V12I4-1179 · Pages 78-88 · Economics

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Street vending constitutes a significant segment of the informal economy in India by generating employment opportunities and ensuring access to affordable goods and services for urban and semi-urban populations. Despite their substantial contribution to local economies, street vendors continue to experience livelihood insecurity arising from limited institutional support, inadequate infrastructure, restricted access to formal credit, and weak social protection mechanisms. This study examines the socio-economic determinants of livelihood security among street vendors in Paramathi Velur Taluk of Namakkal District, Tamil Nadu. The study is based on primary data collected from 355 street vendors using a structured questionnaire covering demographic characteristics, business profile, income, expenditure, access to financial services, registration status, and workplace conditions. The findings indicate that women constitute the majority of vendors, reflecting the growing participation of female workers in the informal economy. Most respondents belong to economically productive age groups but possess relatively low levels of formal education. A substantial proportion operate without official registration or vendor identity cards, limiting their access to government welfare schemes and institutional credit. Vegetable vending represents the dominant economic activity, while inadequate infrastructure, market uncertainty, and regulatory constraints continue to affect livelihood outcomes. The study concludes that livelihood security is shaped by a combination of socio-economic characteristics, business conditions, and institutional support. Strengthening vendor registration, expanding financial inclusion, improving market infrastructure, and enhancing awareness of welfare schemes would contribute significantly to sustainable livelihoods among street vendors.

Keywords: Street Vendors; Livelihood Security, Informal Economy, Socio-Economic Determinants, Paramathi Velur Taluk, Tamil Nadu

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11 A Study to Assess the Effectiveness of a Structural Teaching Programme on Knowledge Regarding First Aid and Safety Measures Among School Children at Selected Schools of District Mandi HP

Paper ID V12I4-1185 · Pages 89-92 · Msc Nursing

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Promoting health, wellness, and disease prevention is increasingly vital in today's changing society. This study aimed to enhance the knowledge of school children regarding first aid and safety measures through a structured teaching programme to prepare them for future emergencies. A quasi-experimental research design was utilized, involving a sample of 100 school children selected via convenient sampling from schools in District Mandi, Himachal Pradesh. Data analysis was conducted using descriptive and inferential statistics. The pre-test mean knowledge scores were comparable between the control (9.68) and experimental (9.9) groups. Following the intervention, the control group's post-test mean score remained statistically stagnant at 9.46, whereas the experimental group's mean score significantly increased to 25.5. This massive improvement in the experimental group was statistically significant (t-value = 33.92, surpassing the critical table value of 2.021 at $p < 0.05$). Additionally, post-test knowledge in the experimental group showed significant associations with age, school type, maternal education, and paternal occupation. The structured teaching programme had a highly significant positive impact on improving first aid and safety knowledge among school children.

Keywords: Knowledge, Structured Teaching Programme, School Children, First Aid, and Safety Measures

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12 Smart Solar EV Charging Station Using IoT

Paper ID V12I4-1188 · Pages 93-101 · Internet Of Things (iot)

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Due to the growing use of electric vehicles, there is a rise in the demand for intelligent charging systems. Conventional wired charging systems rely on physical connection through wires, which results in wear and tear of cables, electricity risks, and inconvenience to the user. In this paper, we will be designing IoT-based smart wireless EV charging with an auto detection and battery monitoring system, which will help us charge the EVs in a smart and automatic manner without any physical connection with the charger, along with the battery monitoring of the vehicle. Our proposed system includes a wireless power transfer arrangement having a transmitter and receiver coil in order to transfer energy without any physical link. The charging will start automatically through the IR sensor when the vehicle is detected in the charging region and will be stopped once the vehicle is taken away from the charging zone. Charging station and vehicle will communicate with each other wirelessly through two ESP32 modules. Charging parameters will be continuously monitored with

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the help of the current sensor INA219, which will measure the voltage, current, and power consumption of the battery, and their values will be displayed on a 16x2 LCD screen. All the collected data will be sent wirelessly to an IoT-based mobile application for remote monitoring of battery percentage and charging states of the system.

Keywords: Internet of Things (IoT), Wireless EV Charging, ESP32, INA219 Current Sensor, Battery Monitoring, IR Sensor, Wireless Power Transfer, Smart Charging System, Automatic Vehicle Detection, Real-Time Monitoring

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13 MedConnect: An AI-Based Health Companion with Medical Report Simplification and 3D Anatomy Visualization

Paper ID V12I4-1177 · Pages 102-106 · Artificial Intelligence

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The increasing demand for accessible and continuous healthcare has motivated the development of intelligent digital health platforms. This paper presents MedConnect, an AI-powered health companion that integrates real-time vitals monitoring using IoT devices, simplification of complex medical reports using large language models, interactive 3D anatomy visualization, and an automated emergency response system. Users can upload medical reports in PDF, image, or text format. The system employs Optical Character Recognition (OCR) with Tesseract, Medical Named Entity Recognition using SpaCy and Med7, and a locally hosted LLaMA-3 8B model via Ollama to generate easy-to-understand plain-language summaries. Identified conditions are highlighted on an interactive 3D human anatomy model built with Three.js and React-Three-Fiber. The platform further supports voice input and output in English, Telugu, and Hindi, real-time emotion detection through webcam, and a reliable SOS mechanism that auto-dials 108 while alerting registered caretakers. Evaluation on a custom dataset of 150 de-identified medical reports yielded a SARI score of 47.6, BERTScore of 73.2, anatomy-mapping accuracy of 91.4%, and emergency response reliability between 96–100%. MedConnect offers a low-cost, privacy-preserving, and scalable solution suitable for preventive healthcare in resource-constrained settings such as India.

Keywords: Artificial Intelligence, Healthcare AI, Medical Report Simplification, Large Language Models, LLaMA 3, OCR, Tesseract OCR, Medical Named Entity Recognition, SpaCy, Med7, IoT Healthcare, Three.js, 3D Anatomy Visualization, Voice Assistant, Emotion Detection, Emergency SOS, React.js, Flask

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14 Altered Pattern of Calcium, Phosphorus, and Calcium/Phosphorus Ratio in Serum and Synovial Fluid of Rheumatoid Arthritis Patients

Paper ID V12I4-1175 · Pages 107-115 · Biochemistry

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Abstract Rheumatoid Arthritis is a systemic autoimmune inflammatory disease characterized by synovitis and serositis (inflammation of the linning surfaces of the joints, pericardium, pleura and rheumatoid nodules). This study was carried to determine the status of biochemical parameters i.e. calcium, phosphorus and calcium/phosphorus ratio in serum and synovial fluid of RA patients. A total of 66 RA patients were included in the study. Out of which 48(72.7%) were female patients of RA and 18(27.3%) were male patients of RA. Some normal individuals (n=25) were also investigated. The levels of serum calcium and phosphorus were found to be significantly (p

Keywords: Calcium, Phosphorus, Rheumatoid Arthritis, Osteoporosis

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15 Detection of Eye Diseases Using Machine Learning Techniques

Paper ID V12I4-1190 · Pages 116-128 · Machine Learning

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Eye disorders have become one of the leading causes of vision loss around the globe. This highlights the importance of early accurate diagnosis of these disorders. Most of the current methods for diagnosing eye diseases use manual examination of retinal images and depend primarily on experienced ophthalmologists. These manual methods can take a lot of time to examine each eye(s) and can also be highly subjective in their determination of a diagnosis.In this project, we will develop an automated framework that uses machine-learning techniques to automatically detect and classify multiple eye disorders from retinal images.We only used traditional machine-learning methods in this work and did not consider using deep-learning models. The proposed framework includes systematic image preprocessing for standardising input images, automated feature extraction using feature extraction methods, and dataset balancing using the synthetic minority oversampling technique (SMOTE) to adjust for class imbalance in each of the datasets used for training and testing our classification system. The proposed framework includes the use of supervised machine-learning algorithms for the classification of all images in each class. The performance of the proposed machine-learning framework was evaluated thoroughly using various performance metrics including confusion matrices, ROC curves, precision–recall analysis, learning curve graphs, PCA visualisation, and cross-validation stability analysis. The results from the experimental evaluations indicated that the proposed machine-learning framework can generate very high classification accuracy and good generalisability for the various types of diseases evaluated using the proposed machine-learning classification system. Overall, the experimental

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results show that the proposed machine-learning framework can provide good quality decision support tools to use for early eye disorder diagnosis in clinical settings.

Keywords: Eye Disease Detection, Machine Learning, Deep Learning, Retinal Imaging, SMOTE, Medical Image Analysis

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16 A study to assess the effectiveness of structured teaching program on knowledge regarding home maneuver for foreign body ingestion among mothers of toddlers in selected villages of district Mandi, Himachal Pradesh

Paper ID V12I4-1187 · Pages 129-132 · Child Health Nursing

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Foreign body ingestion is a common and potentially life-threatening emergency among toddlers. Mothers play a vital role in prevention and immediate management, and adequate knowledge of home manoeuvres can help reduce complications and improve child safety. The main aim of the study was to assess the effectiveness of a structured teaching programme on knowledge regarding home manoeuvres for foreign body ingestion among mothers of toddlers in selected villages of District Mandi, Himachal Pradesh. A quantitative research approach with quasi-experimental non-randomized control group design was used. The study was conducted on 60 mothers of toddlers, with 30 in the experimental group and 30 in the control group. Samples were selected using non-probability convenient sampling technique from selected villages of District Mandi, Himachal Pradesh. Data were analyzed using descriptive and inferential statistics and presented through tables and bar diagrams. The pretest mean knowledge score was 10.13 in the experimental group and 10.03 in the control group, whereas the posttest mean scores were 19.76 and 10.46, respectively. The calculated paired 't' value in the experimental group was 14.82, higher than the table value of 2.05 at $p \leq 0.05$, while in the control group it was 1.12, lower than 2.05. Thus, the structured teaching programme had a significant impact on mothers' knowledge. A significant association was also found between posttest knowledge score and selected socio-demographic variables in the experimental group at $p \leq 0.05$ level of significance.

Keywords: Knowledge, Structured Teaching Program, Home Maneuver, Foreign Body Ingestion, Mothers of Toddlers.

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Impact of Artificial Intelligence Tools on Academic Performance and Psychological Well-Being Among Undergraduate Students in Selected Colleges in Kollam District

Paper ID V12I4-1191 · Pages 133-136 · Mental Health Nursing

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Background & Objectives: The present study was undertaken to assess the impact of Artificial Intelligence (AI) tools on academic performance and psychological well-being among undergraduate students in selected colleges of Kollam district. Methodology: A quantitative research approach with a descriptive research design was used. A sample of 100 undergraduate students was selected from Younus College of Engineering using a non-probability convenience sampling technique. Data were collected through structured questionnaires for measuring AI tool usage, academic performance, and psychological well-being. For the analysis descriptive and inferential statistics were used. Results: The findings revealed that majority of students that is 58% had a high level of AI tool usage, 26% had moderate usage, 13% had very high usage, and 3% had low usage. Regarding the academic performance, 63% achieved excellent level and 37% an average level. Psychological well-being was moderate in 56%, mild in 31%, good in 12%, and poor in 1%. Statistical analysis shows that there is a significant weak positive correlation between AI tool usage and academic performance ($r = 0.240$, $p = 0.016$) and a significant weak negative correlation between AI tool usage and psychological well-being ($r = -0.270$, $p = 0.007$). Conclusion: The study highlights that the usage of AI tools enhance academic performance of students and higher usage of AI tools is reduces the psychological well-being of the student which emphasizing the need for balanced digital habits.

Keywords: Artificial Intelligence Tools, Academic Performance, Psychological Well-being, Undergraduate Students, Nursing Management

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18 A Study to Assess the Knowledge and Attitude Regarding Premenstrual Syndrome and Coping Strategies Among Female Undergraduate Students

Paper ID V12I4-1206 · Pages 137-141 · Obstetrics And Gynecology Nursing

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Premenstrual syndrome (PMS) is a common cyclical condition among women of reproductive age, characterized by physical, psychological, and behavioural symptoms during the luteal phase of the menstrual cycle. The study aimed to assess the knowledge, attitude, and coping strategies regarding PMS among female undergraduate students. A quantitative approach with a descriptive research design was adopted, and 150 female undergraduate students were selected using convenience sampling from a selected college in Kollam district. The findings revealed that 48.7% (n=73) had average knowledge, 97.3% (n=146) had a positive attitude, and 50% (n=75) adopted moderate coping strategies. There was significant Association between the knowledge regarding premenstrual syndrome and selected Demographic variables and no significant association was found between attitude towards PMS and selected demographic variables. The study concluded that the majority of students had average knowledge, a positive attitude, and moderate coping strategies regarding PMS.

Keywords: Premenstrual Syndrome, Knowledge, Attitude, Coping Strategies, Screening

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19 The Bharat Within a National Policy Framework for Youth Well-being, Future-Ready Education, and Nation Building for Generation Z and Generation Alpha

Paper ID V12I4-1200 · Pages 142-150 · Social & Student

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For India to receive a demographic dividend from its demographic window, educational expansion must be matched with the ability to produce resilient and skilled social capital. This secondary-data policy study analyses the “Bharat Within” framework for Generation Z and Generation Alpha. The analysis is based on Indian official data and peer-reviewed literature for the years 2020 to 2025. Since the primary data used in the study existed in a disparate format, descriptive analysis techniques, such as the percentage change, compound annual growth rate (CAGR), and the competition intensity index, were used in the study. India’s education system in the year 2023–24 enrolled 24.8 crore students at 14.72 lakh schools and approximately 4.46 crore in institutions of higher education (provisional figure for 2022–23). NCERT-based findings reported that the surveyed students showed anxiety (11%), extreme emotions (14%), and mood swings (43%). Student suicides reported by the NCRB increased from 12,526 in 2020 to 13,044 in 2022, representing a 4.1% increase and a

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CAGR of 2.0%. Between the years 2020 and 2024, NEET registrations increased by 50.6%. Additionally, between 2022 and 2025, unique registrations for the JEE Main increased by 50.0%. ASER 2024 reported a gap in rural students' social media (vs. educational) use of 19 percentage points; rural students also showed near-universal access to smartphones. Based on this evidence, the study advocates that wellness services offered in schools adopt a flexible and tiered system. Furthermore, it recommends first-response training for teachers, regulated competitive exam prep, innovation and community building, AI and digital wellness training, and the National Student Well-Being Index (NSWI) be developed and integrated into Indian schools.

Keywords: Demographic Dividend; Generation Z; Generation Alpha; Educational Expansion; Social Capital.

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20 Sustainable Rural Development in India: Lessons from the Unnat Bharat Abhiyan Programme in Mudikandam Village, Tiruchirappalli, Tamil Nadu

Paper ID V12I4-1208 · Pages 151-158 · Strategic Management

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The Unnat Bharat Abhiyan (UBA) is an initiative by the Government of India that fosters collaborations between Higher Educational Institutions (HEIs) and rural communities to promote holistic rural development. The present study was conducted to examine the waste collection system, sources of water, sanitation system, source of energy and power, landholding information, agricultural inputs, agricultural production in a year, live stock numbers and major problems persisting in Mudikandam village, Trichy, Tamil Nadu, a constituent state of India. Insights were drawn from a survey by UBA coordinators from Indra Ganesan College of Engineering, Trichy to enhance rural development of v0illage. The findings reveal that the major problems persisting are lack of street lights, hospital, regular buses, plastic recycling, school, cow shelter. The implementation methodology includes a new scheme named Gramasabha meeting was aimed to engage with the local community, understand their needs and discuss ongoing development activities, Solar Street Light Installation Programme programme was organized with the objective of promoting rural development and encouraging the use of sustainable and renewable energy sources and 250 cloth bags were distributed to the public to promote environmental awareness.

Keywords: Collaborative Approach, Higher Education Institution, Rural Development, Sustainable Solutions.

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21 Smart Talking Glove for the Speech Impaired

Paper ID V12I4-1216 · Pages 159-163 · Human Computer Interaction

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The Smart Talking Glove for the Speech Impaired is an assistive device made to help enhance communication for people in need by providing an intensive gesture-based interface. The system captures hand movements or gestures using flex sensors fixed on the fingers of the glove and a motion sensing unit to capture hand orientation. This enables recognition of the predefined gestures or signs. These sensor signals are processed by an ESP32 microcontroller, which is the core processing and communication unit. Using ESP32's built-in Wi-Fi, the recognized data is transmitted to the Blynk IoT platform, where it is displayed as text and at the same time converted into audible speech. Speech generation is done by integrating the Google Textto-Speech (TTS) API, allowing real time speech synthesis using the Blynk IoT application. This system emphasizes portability, comparatively low cost, and user's comfort, making it suitable for everyday use. Experimentation results show reliable performance with high accuracy, minimal latency, and rechargeable battery with prolonged operational life. The Smart Talking Glove also offers scalability, with scope for future enhancements like multilingual support, customizable gestures, Artificial Intelligence/Machine Learning based gesture recognition, and offline operation. Beyond assistive communication, the system shows strong potential for applications in gesture controlled robotics, smart home automation, virtual reality interfaces, and industrial control, highlighting its versatility as both an accessibility solution and an innovative human machine interaction tool.

Keywords: Smart Talking Glove, ESP32, Flex Sensors, Blynk IoT App, Google Text-To-Speech API, Gesture Recognition, Communication, Assistive Technology, Artificial Intelligence, Machine Learning, Speech Synthesis, Motion Sensing, Gesture Recognition.

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22 The Golden Ratio, Fibonacci Sequences, and the Brain: Do Neural Oscillations Follow Mathematical Harmony to Shape Perception and Memory?

Paper ID V12I4-1217 · Pages 164-167 · Neuroscience

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The golden ratio (φ) and the Fibonacci sequence are mathematical patterns that appear in all biological systems, whether it be cardiac systems or plants. This review examines whether the human brain's oscillatory systems follow similar mathematical properties. Neural oscillations are organized into discrete frequency bands (delta, theta, alpha, beta and gamma), and the ratios between them have been said to follow the golden ratio scaling. This review evaluates the evidence across three contexts - spectral organization, cross frequency coupling, and cognitive function (memory and perception). The strongest evidence has come from the memory domain, where hippocampal theta-gamma phase amplitude coupling during successful memory encoding often approaches the golden ratio. On the other hand, sleep dependent memory consolidation shows Fibonacci-like patterns. Despite these findings, there are a lot of important limitations that are still there. The brain naturally

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produces 1/f background activity, making it difficult to know whether these φ like patterns are meaningful or happening by chance. Scientists also do not know of any biological mechanism that would cause brain cells to organize their activity around φ. In addition, studies looking at φ in perception have produced mixed results. Overall, whether the idea that the brain is organized around the golden ratio is interesting and supported by some evidence, it has not been proven yet. Even so, this research has helped scientists better understand how the brain waves interact and how the brain processes and stores memories.

Keywords: Golden Ratio, Fibonacci Sequence, Neural Oscillations, Cross Frequency Coupling, Memory, Perception, Cognition, Hippocampus, Theta-Gamma Phase, Brain

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