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Exploring the Implementation Method for Multi-modal Maintenance Support and Remote Expert Collaboration in Intelligent Manufacturing Management

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Abstract

Maintenance support encompasses the activities conducted in industrial applications to maintain, restore, or enhance the technical state of equipment. With the continuous advancement of intelligent manufacturing technology, the mechanical structure of intricate industrial equipment is becoming increasingly sophisticated, while manufacturing technology is becoming more intensive. Traditional approaches to maintenance and support are no longer adequate for fulfilling the product maintenance requirements of such equipment. Therefore, in response to the "three high" requirements (high maintenance accuracy, high response efficiency, and high safety and privacy) for maintaining and supporting complex industrial equipment in intelligent manufacturing management, we have designed and developed a multi-modal maintenance support and remote expert collaboration platform using augmented reality and artificial intelligence technologies. This platform combines new information technologies such as optical perspective, scene perception, digital twin modeling, target recognition, real-time tracking algorithms, and multi-modal remote collaborative interaction. By organizing auxiliary maintenance information through modeling and situational awareness with fusion display capabilities, this platform can intelligently recognize fault categories of complex industrial equipment at different degrees. Through interactive methods such as hand gestures, line-of-sight focusing, and voice commands with overlapping virtual-real modes, on-site personnel are provided technical support, including intelligent data collection and fault recognition guidance during work processes, while also enabling expert remote collaboration. The result is digitization standardization and visualization intelligence in maintenance tasks, which reduces communication distortion, human error rates, risk factor coefficients, and accident rates in maintenance operations, thereby improving overall efficiency, security and privacy. Furthermore, the research findings can also be applied within the simulation environment of vocational training for maintenance and support operations, thereby offering operators with highly realistic and easy-to-obtain equipment scene data to enhance the efficacy of maintenance and support vocational training.

Keywords: *Augmented Reality; Intelligent Manufacturing Management; Maintenance Support; Expert Collaboration; Vocational Training*

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Metastatic Valvular Heart Disease: Mitral Regurgitation

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Abstract

Metastatic valvular heart disease (MVHD), a rare complication of advanced malignancies, presents a diagnostic and therapeutic challenge to clinicians. Among its manifestations, mitral regurgitation (MR) stands out as a significant clinical entity. MVHD occurs when metastatic cells infiltrate the cardiac valves, disrupting their structure and function. MVHD is primarily associated with cancers originating from breast, lung, renal, or gastrointestinal sites. The infiltration of metastatic cells into the mitral valve apparatus leads to MR, often presenting with symptoms ranging from asymptomatic to severe heart failure. The diagnosis relies on clinical suspicion, echocardiography, and histopathological confirmation. Echocardiography, particularly transthoracic and transesophageal, plays a crucial role in assessing MR severity and etiology. Management of MVHD necessitates a multidisciplinary approach tailored to individual patient factors. Treatment strategies, including medical therapy and surgical intervention such as valve repair or replacement, Prognosis remains poor, with survival largely dictated by the underlying malignancy. In conclusion, MVHD, with MR as the predominant manifestation, poses a clinical challenge due to its rarity and complex pathophysiology. Early recognition, accurate diagnosis, and collaborative management are crucial in optimizing outcomes for affected patients.

Keyword: *Cardiac Metastasis; Diagnosis; Management; Echocardiography; Metastatic Valvular Heart Disease; Mitral Regurgitation; Malignancies; Multidisciplinary Approach; Prognosis; Treatment Strategies*

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An Analysis and Proposed Conceptual Model for Researching the Value of Luxury from the Perspective of Chinese Consumers

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Abstract

Researchers and marketers in the luxury industry are realising the importance of knowing how Chinese clients put a monetary value on luxury items given the country's rapidly rising middle class. While studies conducted in developed countries provide some theoretical light on how people place a monetary value on luxury goods, there is surprisingly little information available on how Chinese customers place such a value. This research examined the literature and evaluated several conceptual models to better understand the factors that influence Chinese consumers' perceptions of their personal and society's luxury. As a consequence, this research increases their grasp of the motives behind luxury purchasing among Chinese consumers, the nature of luxury in the perspective of the Chinese, and the elements that impact their appraisal of luxury items. Given this theoretical gap, the current study seeks to fill it by establishing, proposing, and evaluating a conceptual framework that describes the major variables that impact Chinese consumers' luxury purchasing behaviour, drawing on findings from the existing literature and primary data obtained from Chinese luxury brands. Several methods were used to construct and evaluate a theoretical model of Chinese consumers' valuation of high-end products. This was carried out over the course of two iterations of fieldwork. Ten in-depth interviews with Chinese luxury consumers were selected for the first stage of the field research so that we could inquire into, separate out, and provide context for the most significant aspects influencing those consumers' value judgements. Ten hypotheses were derived from the qualitative data and the available literature, and the linkages between individual and societal judgements and the luxury value perceptions of Chinese consumers were validated by the study. Moreover, public opinion may impact how people view themselves. The hedonic seeking value, the individuality value, and the narcissism value of luxury items all contribute to how they make their purchasers feel about themselves.

Keywords: *Chinese Customer; Conceptual Model; Investigation; Marketing Strategies; Perspective of Luxury Value*

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Workplace Satisfaction and Affective Commitment: An Empirical Study in Guandong Province, China on Senior Professional Turnover Intention

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Abstract

Companies in China that were owned by the general public have had a difficult time thriving in recent years as a result of low levels of government investment and the requirement to generate sufficient profits to satisfy fundamental operating and expansion goals. This is because of a combination of factors, including low levels of government investment and the demand to generate sufficient profits. This is dependent not only on the medical team's technical expertise and their ability to provide excellent customer service, but also on the medical team's depth and breadth of great senior experts in a range of sectors. This can only be achieved if the medical team possesses both of these qualities. These accomplishments bolster the clinical position of the company and were the embodiment of its technological and scientific expertise. As a result, they ensure the quality of the company's products and contribute to the company's appeal. Despite this, these specialists were in high demand as a result of the vast medical industry that exists in China as well as the abundance of other competitive businesses that operate in the sector. In light of these facts, one of the most important challenges for human resource management is figuring out how to boost job satisfaction and cultivate emotional commitment in order to retain highly sought-after senior professionals.

Keywords: *Affective Commitment; Guandong Province; Turnover Intention; Workplace Satisfaction*

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The Effectiveness of the Educational Psychology Report: An Exploratory Study Taking into Account the Perspectives of Stakeholders Across the Youth, Caregiver and Educational

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Abstract

There has to be more parental and student input into how special education needs are addressed, and educational psychology services need to be held more accountable, especially when it comes to showing the results of their interventions on their clients, who are kids and teens. According to recent policy changes and research in the field of special education. The research set out to investigate the effects of consultation in four areas: first, how teachers feel about their own influence on their students' progress; second, how parents feel about the effect of consultation on their child's progress; third, how students felt about the effect of the actions taken after educational psychologists consulted with school staff and/or parents on their own progress; and lastly, what educational psychologists thought were the most important factors for consultation to have a positive effect on students' progress. Educational psychologists collaborated with classroom instructors via Target Monitoring and Evaluation (TME) conferences to establish goals and track students' development. To find out how people felt about the consultation, researchers used semi- structured interviews. Reviewing and further developing the service's approach to consultation is necessary to ensure that parents and pupils are more involved in determining and monitoring targets, even though EPs and those to whom they offered consultation perceive consultation as a helpful approach.

Keyword: *Educational Psychology; Evaluation; Stakeholders; Target Monitoring*

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The Use and Gratification of Artificial Intelligence (AI) in Television News Production in China's Guangdong Province

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Abstract

The study delves at how AI has altered the media landscape. The effects of AI integration on many aspects of the television environment are thoroughly examined via a systematic literature study that emphasises important topics and concepts. Ethical considerations, the theoretical underpinnings of "artificial intelligence" (AI) in the television industry, content creation and curation, television distribution and ingesting, marketing and advertising tactics, and labour dynamics are all part of the research. According to the research, AI has revolutionised the media sector by improving content production and curation, automating data analysis, tailoring user experiences, increasing advertising efficiency, changing the dynamics of the workforce, and posing significant ethical challenges. The benefits of AI include increased efficiency, personalisation, and innovation; yet there are concerns about algorithmic prejudice, job loss, and privacy that require more research. The findings stress the need for ethical AI practises, skill-updating methods, and moral standards. By drawing attention to research gaps, methodological advances, and regulatory consequences, the endeavour adds to the body of learning and influences the future of AI in the television sector.

Keywords: Artificial Intelligence (AI); Television News Production; Guangdong Province; Gratification; Media Technology

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Teacher Thinking: A Qualitative Approach to the Study of Piano Teaching

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Abstract

This study explores the musical and pedagogical transactions involved in piano teaching. Adopting a qualitative approach, it focuses on the work of six piano teachers teaching in a variety of contexts and employs observation and semistructured interview. It is concerned not only with teacher's behaviour but with the meaning behind that behaviour and its significance in terms of the context in which it occurs. It emphasises the teacher's viewpoint, by exploring teacher thinking, consulting with teachers as they reflect upon their own practice and describe and explain the purpose behind their actions. The study is divided into four parts. Part 1 outlines the theoretical orientations of the study, with Chapter 1 exploring literature on teacher thinking and knowledge, identifying appropriate conceptual and methodological starting points, and recognizing pedagogical content knowledge as a critical unit of analysis. Chapter 2 focuses on piano pedagogy literature and research on music teaching and learning, outlining Swanwick's model of musical criticism as an interpretative framework for data analysis. Part 2 addresses methodological issues, with Chapter 3 detailing the assumptions underlying the adopted qualitative approach, describing the research method and design, and explicating the research process. Part 3 gives voice to the teachers by focusing on their reflections on music, teaching, and learning. Finally, Part 4 interprets and discusses the data in the context of the theoretical frames presented in Part 1.

Keywords: *Teacher Thinking; The Qualitative Approach; Piano Teaching; Employs Observation; Semi Structured Interview*

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Application of Customized Split Loop Elements (SLE) as a Complementary Wave Reflector to Enhance Directivity of a Miniature Transmitter

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Abstract

This paper reports on utilizing split loop elements (SLE) organized periodically and their electromagnetic wave cavity characteristics as an unconventional approach to redirect surface waves. The SLE was modeled through Eigen-mode Solver (EmS) and Advanced Krylov Sub-space (AKs) computerized calculation to realize a focused full-wave diffusing chart. This proposed approach has produced a consistent bandgap from 5.8 GHz to 5.95 GHz. A careful study was done to check whether surface waves from a small transmitter with the joining of single-layer SLE, acting as a reflector, will influence the targeted result. This arrangement was found to come out with an appropriate reflection value to go around as a reflection and lift the resonator gain, performance, and impact surface wave. The transmitter has a basic return loss of - 10 dB with a straight response of 5.8 GHz and up to 5.95 GHz is found workable utilized for this 50 Ohm transmitter purposes. An alteration of 0.39 and up to 0.74 dBi IEEE increment for the pined for recurrence span have been realized. Non-IEEE dBi scrutinizing will possibly lower radiation efficiency of 0.246. Such efficiency is improved adequacy regard is expanded to 0.406 once the split loop elements reflector is implanted. SLE unit cell affectability can be evaluated by separating its electrical surface field strength inside the item and a while later measuring the electrical field using a test probe inside an EM shielded room.

Keywords: *Split Loop Elements (SLE); Wave Reflector; Miniature Transmitter*

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A Study to Navigating the Challenges: Female Sports Moderator in a Male-dominated Industry

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Abstract

Sports journalism still gives women's sports a considerably lower rate of coverage, even though the area is expanding. The tiny number of journalists who cover women's sports and are open to discussing the subject further contributes to the marginalisation of women's sports. This research aims to fill a gap in the literature by conducting in-depth interviews with female sports journalists to learn about their professional identities and perspectives on the status of women's sports coverage in the media. The majority of participants identified as female athletes, and they hoped that changes in the makeup of newsrooms and advancements in digital news technology would lead to more favourable coverage of female athletes' athletic events. There has been a lot of talk about gender bias in the workplace for a long time now. Women earn 80 cents for every dollar that men earn, according to the National Partnership for Women and Families. This figure does a good job of representing the salary discrimination that women experience across all sectors, but they must not ignore the other forms of discrimination that women confront. Particularly striking is the dearth of female representation in the traditionally male-dominated field of athletics. This underrepresentation is not only explained by women's lack of interest in this field, however.

Keywords: *Female Sports; Male-Dominated Industry; Sports Moderator; Grounded Theory*

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An Inquiry to Evaluate the Usage of Computers for Assessing Improvements in Patient Care within Hospital Settings is Being Conducted Via this Study

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Abstract

Within the scope of this study, a research is presented that evaluates the usage of computers to measure the enhancements in patient care that have been implemented in hospitals. The purpose of this research is to investigate the ways in which computer technology has the potential to improve the quality of care provided to patients in hospitals. In the beginning of the research, there is a review of the literature about the use of computers in the medical field. This includes the use of electronic health records, clinical decision support systems, and telecommunication. The topic of debate includes both the benefits and the challenges that these technologies provide, as well as the impact that they have on the costs of healthcare and the results for patients. Following that, the research presents a case study of a hospital that has adopted a digitized patient care system based on the findings of the study. Telemedicine skills, clinical decision support, and electronic health records are all included in the system's capabilities. The purpose of this inquiry is to evaluate the impact that the system has on patient care, which includes better diagnostic accuracy and efficiency, increased patient happiness, and greater health care cooperation among healthcare professionals. According to the conclusions of the research, the use of computer technology in hospitals has the potential to considerably improve the healthcare that is provided to patients. There are a number of benefits associated with computerized patient care systems, including better diagnostic preciseness and effectiveness, greater coordination of treatment among healthcare practitioners, and higher patient satisfaction. On the other hand, the research highlights the challenges that are involved with the deployment of these systems, such as aversion to change, the expense, and the need for training. Taking everything into consideration, this inquiry provides significant insights into the potential of electronic devices to improve patient care in institutions to healthcare practitioners who are considering the deployment of these systems.

Keywords: *Clinical Decision Support Systems; Computerized Patient Care System; Improving Patient Care; Patient Care; Electronic Health Records*

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An in-depth Examination and Formulation of an Equalization Strategy to Mitigate Data Error Rates Through the Study of Diverse Error Types

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Abstract

The article concludes by hinting at potential future directions for research in this domain. The continuous evolution of data processing technologies and methodologies necessitates ongoing exploration for further refinement of error mitigation strategies. This study offers a significant contribution to the critical area of data error reduction. The equalization approach presented provides organizations with a practical and effective means to enhance data accuracy, ultimately paving the way for improved organizational performance and success. In this insightful article, the authors delve into the crucial realm of reducing data error rates, recognizing the substantial implications these errors can have on organizational processes. The primary focus is on studying the diverse types of mistakes inherent in data processing and formulating an effective equalization approach to rectify them. The identification of actual error types is a crucial aspect of academic research. It involves the systematic analysis and categorization of errors found in many contexts, such as written texts, spoken language, or experimental data by identifying. The researcher aptly categorize data errors into two main types: random errors and systematic errors. Random errors, stemming from chance, can be curtailed through increased sample size or improved measurement techniques. Systematic errors, consistent and caused by various factors, necessitate a more nuanced approach. These experiments showcase the approach's prowess in significantly reducing error rates, thereby enhancing the accuracy and dependability of results. Methods for Reducing the Impact of Random Errors, By emphasizing the role of increased sample size and improved measurement techniques, the authors acknowledge the importance of mitigating random errors. The tailored correction techniques and systematic error identification provide organizations with actionable strategies for elevating data accuracy. Expanded meaning because, the authors position their research within the broader context of data quality management. By addressing both random and systematic errors, the equalization approach contributes to advancing standards in data accuracy, fostering a culture of reliability in organizational data practices.

Keywords: *Random Errors; Correction Techniques; Error Rates, Sources of Error; Systematic Errors; Equalization Approach*

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A Study About Role of Computers in Digital Forensics for Business During Disaster and Cyber Crisis: A Comprehensive Study

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Abstract

In the face of escalating cyber incidents and disasters, it is imperative for businesses to adeptly respond to safeguard their assets, customers, and reputation. Digital forensics has emerged as a critical tool for enterprises to investigate such incidents, gathering digital evidence to comprehend the intricacies of the events. However, the intricate interplay between computer technology and digital forensics in times of crisis remains underexplored. This study seeks to delve into the impact of computer technology on digital forensics, specifically examining its role in aiding businesses during crises, encompassing both disasters and cyber crises. The research endeavors to scrutinize how computer technology facilitates the identification, collection, preservation, analysis, and presentation of digital evidence in instances of cyber incidents and disasters. A comprehensive investigation will also be conducted to understand the challenges that businesses encounter in implementing digital forensic strategies amidst crises, with a parallel exploration of potential solutions to surmount these challenges. The study's exploration will not only scrutinize the motivations behind businesses implementing digital forensic strategies during crises but also delve into the characteristics that underpin successful implementation. Additionally, it may delve into the legal and ethical considerations surrounding the use of digital forensic tools and techniques during crises. The research findings are poised to offer valuable insights for businesses, digital forensic experts, and policymakers, shaping the discourse on leveraging computer technology in digital forensics during crises. The study is poised to contribute to the formulation of best practices and guidelines, fostering effective implementation of digital forensic strategies by businesses. This research assumes significance as it holds the potential to enhance businesses' response capabilities in times of crisis. A comprehensive understanding of how computers intersect with digital forensics equips businesses to proactively prepare for and effectively respond to cyber incidents and disasters, thereby mitigating the impact on their operations, reputation, and financial standing. Employing a mixed-methods approach, including surveys, interviews, and case studies, the study aims to gather and analyze data, shedding light on the nuanced role of computer technology in digital forensics for businesses during times of crisis. The ultimate goal is to distill insights and recommendations that can empower businesses to fortify their preparedness and response mechanisms against cyber crises and disasters, leveraging digital forensic tools and techniques.

Keywords: *Forensic Techniques; Digital Forensics; Forensic Tools and Strategies; Cyber Crescive Incidents; Digital Forensic Experts Cyber-Attacks*

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A Study to Analyse the Ramifications of Computing for Culture and Industry and the Influence of Computing on Classroom Instruction

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Abstract

This research-based dissertation explores the extensive impact of computing on culture, industry, and education, with a particular focus on the integration of Information and Communication Technology (ICT) in classroom instruction. Despite significant investments and policy initiatives aimed at enhancing ICT use in schools, effective integration remains limited. This study investigates the reasons behind this gap and proposes a targeted professional development program to address it. The research highlights the critical role of teachers in successful ICT integration. Often, the lack of effective ICT use in classrooms is attributed to inadequate teacher training and support. To bridge this gap, the proposed professional development program is designed to equip educators with the necessary skills and confidence to incorporate ICT into their pedagogical practices, fostering a constructivist approach to teaching and learning. The program consists of two phases. The first phase involves assessing the current school culture regarding ICT, training teacher-mentors, and collaboratively developing a school-wide vision for ICT integration. The second phase focuses on intensive training sessions aimed at enhancing computer proficiency, applying constructivist teaching methods, and fulfilling mentoring responsibilities. Teacher-mentors will also create ICT-integrated lesson plans and establish support systems for resource sharing and strategy dissemination. Using qualitative data collection methods such as interviews and surveys, the study examines the effectiveness of the professional development program and its impact on teachers' ICT integration. The findings demonstrate the program's potential to improve teachers' ICT skills, promote innovative teaching practices, and enhance student engagement and learning outcomes. This research contributes to the broader discourse on ICT in education by offering practical insights and strategies for effective integration. It underscores the importance of tailored professional development and collaborative efforts among educators, administrators, and policymakers to create a supportive environment for ICT use in education.

Keywords: *Computing Culture; Industry; Influence of Computing; Technology; Classroom Instructions*

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The Use of Differential Reduction of Generalised Hypergeometric Functions to Feynman Diagrams: One-variable Case

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Abstract

This article investigates the differential-reduction process for evaluating Feynman diagrams using generalized hypergeometric functions, focusing on the one-variable case. The researcher explores how integrals derived from Feynman diagrams can be simplified through differential reduction techniques, transforming the reducibility requirements of multiloop Feynman integrals into conditions related to hypergeometric functions. This study compares the study's findings with well-established methods, highlighting the connections between the number of master integrals obtained via differential reduction and those derived from integration by parts. The study's results demonstrate that the criteria for reducibility using hypergeometric functions can effectively rephrase and simplify the analysis of multiloop Feynman integrals. Additionally, the researcher discusses the computational advantages of this method, emphasizing its potential to enhance the precision and efficiency of radiative correction calculations in high-energy physics. By examining the interplay between Feynman diagrams, differential reduction, and hypergeometric functions, this work contributes to a deeper understanding of the intricate theoretical frameworks that govern particle behavior in quantum field theory. The study's findings underscore the importance of algebraic simplification in addressing complex integrals, ultimately aiding physicists in their quest to unravel the fundamental interactions within the quantum realm. This research provides valuable insights into the practical application of differential reduction techniques, paving the way for more efficient and accurate computations in high-energy physics.

Keywords: *Differential Reduction; Hypergeometric Functions; Feynman Diagrams; Multiloop Integrals; Quantum Field Theory*

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A Study to Understand Next-Generation Computer Memory Architectures through the Use of Modeling and Leveraging Emerging Non-Volatile Memories

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Abstract

Energy efficiency in computer system architecture is of the utmost importance nowadays. The common belief is that as CMOS technology becomes smaller, the leakage would increase exponentially since traditional CMOS scaling theory predicts that threshold and supply voltages were decrease in response to device sizes. As a result, methods of the present generation see leaky power as rival to dynamic power. Prior to power budget leakage being an important issue, there has to be a boom of groundbreaking, industry-altering technologies. In the field of non-volatile memory technology, there have been several exciting new advancements. Resistive Random Access Memory (ReRAM), Phase-Change Random Access Memory (PCRAM), and Spin-Torque-Transfer Random Access Memory (MRAM, STTRAM) are all examples of modern non-volatile memories that have appealing properties including low access energy, high cell density, and excellent access performance. So, it's great to see these new non-volatile memory technologies being used to build low-power, high-performance computers in the future. Since these novel non-volatile memory technologies are still in their early stages of development, further academic research is required to demonstrate their worth. In light of this, this dissertation investigates three strategies for assisting these novel types of non-volatile memory. Space, power consumption, and circuit-level performance models of several nonvolatile memory types serve as the starting points. Secondly, they propose and evaluate several architecture-level strategies to mitigate write operations' detrimental impacts on non-volatile memory. Lastly, they conduct case studies of real-world applications for this state-of-the-art technology.

Keywords: *Non-volatile Memory; Computer Memory Architectures; Resistive Random-access Memory; Phase-change Random Access Memory*

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A Study on the Development and Research of Very Power Efficient Electronic Circuits for Use in Body Sound Menitoring

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Abstract

Energy is constantly being dissipated by humans, from their heartbeats to their footsteps. In order to power electronic medical equipment that are directly tied to human health, scientists are attempting to extract energy from the human body and transform it into electricity. Researchers in the domains of bioelectronics and energy harvesting are now focusing on this kind of energy recycling. In the first part of this examination, we will go over the basics of the human body's three main energy sources: thermal, chemical, and mechanical. Following that, several energy sources are covered, along with the energy collecting methods that may be used and how they function. Also included are some common demonstrations and real-world uses for each kind of energy harvesting device that taps into the human body. Particularly, we provide a synopsis of the benefits and major drawbacks of various energy collecting devices and suggest some viable alternatives. Additionally, the methodologies for wearable and implantable energy harvesting device interactions with the human body are outlined. At long last, an innovative idea has been proposed for a self- powered closed-loop bioelectronic system (SCBS). This system would integrate the human body with various electronic equipment, such as portable electronics, implanted medical devices, energy harvesting, and so on.

Keywords: *Energy Harvester, Human Body, Self-powered, Closed-loop, Bioelectronic System*

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A Study to Analyse the Difference Between Deep Learning and Machine Learning

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Abstract

The revolutionary subfields of computer science known as machine learning and deep learning are finding significant application in the business world. The process of teaching computers and other machines how to make predictions based on prior data or actions using examples from their own memory is known as machine learning. Deep learning is a subsection of machine learning that makes use of artificial neural network techniques and algorithms to train and learn from data that is not structured. This allows for learning to take place from data that is not organized. In order to make sense of the mountain of data that is being created each day, there is an urgent need for techniques of data usage and management that are highly automated and technologically advanced. The software for machine learning (ML) and deep learning (DL) is subjected to a thorough investigation that we provide in this work. The study serves as an introduction to the fundamentals of ML and DL. The most widely used approaches and techniques in fields made feasible by technological advancements are investigated next. In conclusion, a business point of view is presented on the two applications of ML and DL that are most often used.

Keywords: *Deep Learning; Machine Learning; Artificial intelligence*

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A Study to Analyse How to Use Renewable Energy Sources and Put Sensors in Solar Panels to Track the Amount of Heat Produced

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Abstract

When it comes to renewable energy sources, solar power is the only one that has seen rapid growth in both popularity and significance. With the help of the solar tracking system, they can maximise the efficiency of the solar panels and generate a surplus of energy. The effectiveness of solar panels is due to the fact that they are perpendicular to the direction of the sun's beams. Even if there are less expensive alternatives, the installation fee is large and pecuniary. An embedded NodeMCU microcontroller serves as the heart of the control circuit. This device's programming allows the LDR sensor to detect the sun's rays and then instruct the DC motor to spin the solar panel in a certain direction. With its low speed and strong torque, a DC motor is the most elegant and understated of the motor types. Even though it can only spin in one way (within programming, of course), we can still programme it to change directions. This forces consumers to either buy many panels to cover their energy needs or invest in high-output systems. Assuming they are too expensive to buy, varieties of solar cells with better efficiency are available. There is a myriad of options available for improving the efficiency of solar panels, but tracking is one of the most cost-effective methods to achieve this goal. With tracking, the panel may be angled towards the sun more broadly, increasing its power production. It could be a tracker with two or one axe. When it came to monitoring the sun's rays from both axes, compatibility improved with duality. Using a single tracker for commercial purposes is less expensive because of significant power booms; hence, a little price hike is justified and reasonable, so long as maintenance costs remain relatively stable.

Keywords: *Renewable Energy; Engineering; Solar Panel; Economic Development*

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Teaching English for Specific Purposes in Vocational University: Teachers' Attitude and Practice

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Abstract

Quantitative and qualitative methods were used in the investigation to compile the data for this article. The study's overarching goal is to improve peoples' understanding of teachers' opinions on English teaching in vocational settings, how those views play out in teachers' everyday practices, and how teachers' students feedback in school shapes those views. 120 vocational university students from four different disciplines in the took part in the study, all of them were in their third year of the study. The four majors represented here were accounting, industrial processing, machine technology, and civil construction. Data was collected using a variety of methods, including semi-structured interviews, notes taken during discussions, and classroom observations. After that, the data was separated in a logical order. It's often assumed that an ESP (English for Specific Purposes) teacher at a vocational university is the same as an English teacher at a conventional university. This is because ESP teachers need a certain skill set and body of knowledge. This research shows how difficult it may be for educators to attempt new approaches in the classroom. The end outcome proves these rationales. There might be a disconnect between classroom instruction and real- world application because of issues including student population, workload, textbook incompatibility, and individual requirements.

Keywords: Classroom Practices; Teacher's Belief; Teaching English; Vocational School

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A Study to Understand the Impact of Strategic Management Practices on the Organizational Performance of Real Estate Businesses in Chinese

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Abstract

The purpose of this study is to examine how organizational strategic management approaches and procedures have an impact on the success of China's real estate businesses. Strong strategic management practices and a clear corporate mission are necessities for today's real estate organizations. Using a quantitative methodology, this study's participants -- who came from a variety of Real Estate Organizations spread across China's six geopolitical zones -- gathered and analyzed data pertaining to strategic management in the industry. Many investors believe that real estate investment will continue to be a major source of competitive advantage with good Return on Investment (ROI) over other forms of investments and sectors of the economy in China. The China government recognizes real estate as a prime investment and one of the country's most valuable resources. The real estate sector contributes to the economy through facilitating the distribution of income, housing working families, and reducing poverty. The profitability of the business, the ever-evolving nature of office space, and the uncertainties plaguing the sector are all factors in its perpetual transformation. Nevertheless, several factors—including Government policies, Foreign Exchange accessibility, the lack of a clear strategy, plan, and implementation, and the lack of right leadership skills to aid in the growth of the industry—have kept the China real estate sector from fulfilling its fundamental roles. The study's findings and implications will aid the China government, regulators, policymakers, and real estate industry players, as well as students and other researchers, in making more well-informed decisions about the state of the China real estate market and how best to implement strategic management practices.

Keywords: *Strategic Management; Organizational Performance; Real Estate Agency; Business Process*

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The Role of Cultural Values in Shaping Chinese Students Online Learning Experiences in Foreign Public Universities

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Abstract

This study aimed to determine how cultural values affect Chinese students' online learning at public US schools. Three research questions guided this study: What is online learning like for Chinese students at US public colleges? How do Chinese students' sociocultural origins impact online learning? Finally, how do Chinese students balance online study and culture? To acquire data, researchers employed qualitative methods and in-depth, semi-structured interviews. 11 Chinese graduate students from six Southeast US public institutions were randomly selected to discuss their online education experiences. Everyone in the research was a graduate student from China's mainland studying in the US and had taken an online course in the last three years. For this study, a course was deemed online if at least 75% of the needed hours were online. After eleven interviews, the researcher transcribed them and utilised continual comparative analysis to find trends. The data showed that Chinese students' online learning experiences are shaped by a desire to take charge of their education, technology, teachers, classmates, and learning communities and support. The second set of data specified cultural and social factors affecting Chinese students' online education. The key sociocultural factors are Chinese values and school norms, American teaching technique, and language. Chinese students learn online differently from American students because they value silence, hard work, conscientiousness, formal, material-focused discussions, respect for the instructor, caring about others, and avoiding embarrassment. The third research question, "How do Chinese students negotiate cultural values and learning styles in their online courses?" required students to compare American and Chinese classroom methods, identify cultural overlap and diversity, and develop online success strategies. Three conclusions were drawn from this study's data: Chinese students at American institutions negotiate and build culture via online learning, which incorporates shared and distinctive experiences. Cultural values including collectivism, hierarchical connections, conservatism and conformism, harmony-seeking, face-saving, and effort and diligence impact Chinese students' online learning habits and experiences.

Keyword: *Cultural Values; Chinese Students; Online Learning; Online Learning Experience; Online Courses Foreign Universities*

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A Study to Determine the Role of Nursing in Comprehending the Reasons Why So Many Young Women Give Birth to Unwanted, Unplanned

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Abstract

Because teenage pregnancies and deliveries often have disastrous consequences for both the mother and the child, they represent a serious public health concern. This study looks at how nursing could help identify the underlying causes of these iatrogenic pregnancies using a mixed-methods approach. Both qualitative and quantitative methods will be used in the study to gather information and provide a full picture of this complex issue. There are dangers to the health of the pregnant mother and her unborn child associated with delayed prenatal treatment start times and lower rates of prenatal treatment attendance, which are connected to the high prevalence of unplanned births. No research has looked at the effects of prenatal planning on women' postpartum health, even though free prenatal care and abortion are readily available in Malaysia. This study looked at the connections between Malaysian women's utilisation of prenatal care and outcomes and their ability to plan their pregnancy. Medical records were used to gather information on variables such patients' level of education, marital status, lifestyle choices, and the date of their first prenatal visit. The mother's age was calculated by summing up the years of her life before giving birth. Women between the ages of 20 and 34 served as a comparative category for women of every age.

Keywords: *Nursing; Adolescent Pregnancies; Childbirths; Unplanned, Unwanted; Lifestyle Choices; Gestational Age*

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Sustainable Management Practices in the Development of Green Technologies for Materials Science

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Abstract

In the contemporary quest for sustainability, the development of green technologies in the field of materials science has emerged as a pivotal area of research and innovation. This paper delves into the intersection of sustainable management practices and the advancement of green technologies, emphasizing their significance in achieving environmental sustainability and resource efficiency. The study presents a comprehensive examination of various management strategies that are instrumental in fostering the development and implementation of eco-friendly technologies. Key strategies explored include lifecycle assessment, which evaluates the environmental impacts of products from inception to disposal; eco-design principles, which guide the creation of products with minimal ecological footprints; and stakeholder engagement, which involves collaboration with various parties to ensure that technological advancements align with sustainability goals. Through a detailed review of current practices and case studies, this paper illustrates how sustainable management practices contribute to the success of green technology initiatives. It highlights successful examples where management strategies have led to the development of innovative materials and processes that support environmental conservation and sustainable development. The paper also discusses the challenges and opportunities associated with these practices, offering insights into how organizations can navigate the complexities of integrating sustainability into their technological endeavors. Additionally, the study explores future directions for research and development in the field of materials science, proposing avenues for further exploration that could enhance the effectiveness of green technologies. By integrating multidisciplinary perspectives, the paper provides a holistic view of how sustainable management practices can drive progress in the development of green technologies. The findings underscore the importance of a strategic approach to managing technological innovations in a way that balances environmental concerns with practical and economic considerations. This exploration of sustainable management practices offers valuable lessons for researchers, practitioners, and policymakers aiming to advance green technologies and achieve a greener future. The paper concludes with a set of recommendations for improving management practices in materials science, aiming to inspire continued efforts towards sustainable technological development.

Keywords: *Environmental Sustainability; Lifecycle Assessment; Eco-Design Principles; Environmental Conservation; Strategic Management; Technological Development*

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Designing for Sustainability: How Creative Arts Can Promote Environmental Responsibility in Material Choices

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Abstract

As global environmental concerns intensify, the creative arts community is increasingly recognized for its potential to drive sustainability initiatives and promote environmental responsibility. This article examines the role of creative arts in advancing sustainability through innovative material choices and design practices. By exploring the intersection of art and environmental ethics, the study presents a comprehensive analysis of how creative disciplines can contribute to eco-friendly practices in material selection and design processes. The article begins by providing a historical overview of sustainability in the arts, tracing the evolution of eco-conscious practices from early environmental art movements to contemporary design approaches. It highlights key concepts in sustainable design, including the use of renewable resources, reduction of waste, and the incorporation of life cycle assessments in material choices. Through an examination of case studies from diverse artistic disciplines - ranging from visual arts and design to performance and installation art - the study demonstrates how artists and designers are creatively addressing environmental challenges. In addition to case studies, the article delves into theoretical frameworks that support the integration of sustainability principles into artistic practices. It discusses how artists can leverage their unique perspectives and skills to advocate for environmental awareness and inspire audiences to make sustainable choices. The study also explores the potential for interdisciplinary collaborations between artists, designers, and environmental scientists to develop innovative solutions for pressing ecological issues. The findings reveal that the creative arts offer valuable insights and methodologies for promoting environmental responsibility. By employing sustainable materials, adopting eco-friendly design strategies, and engaging with communities through educational initiatives, artists can play a pivotal role in fostering a culture of sustainability. This research aims to enrich the discourse on sustainable development by illustrating the ways in which creative arts can drive meaningful change and encourage more responsible material use in design. Ultimately, the article asserts that the creative arts possess a unique capacity to bridge aesthetic and environmental considerations, providing new avenues for achieving sustainability goals. It calls for a continued exploration of the synergies between art and environmental stewardship, advocating for a future where creativity and sustainability go hand in hand to shape a greener world.

Keywords: *Sustainable Design; Renewable Resources; Environmental Ethics; Interdisciplinary Collaboration; Environmental Awareness; Art Movements*

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Research on Prediction of Deformation in Beam String Structure Based on BP and SSA-BP Neural Network

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Abstract

A typical Beam String Structure (BSS) mainly consists of a steel beam and a tension string and may also have some vertical struts to connect the beams and tension strings. With the introduction of steel cables, the relationship between the deformation characteristics of the structure and each influencing factor is a complex nonlinear problem. Max deformation is one of the most crucial parameters for evaluating BSS performance. Nowadays, deformation can be predicted based on the existing database to guide the mix design with the development of machine learning (ML) such as back-propagation neural network (BPNN). To predict the deformation of a beam string structure under external loads, machine learning is used to analyze the database of 180 calculation examples, and BP neural network and SSA-BP neural network are used to predict and analyze the max deformation values of prestressed beam string under external loads. The input layer parameters are external load, span, rise span ratio, vertical span ratio, steel cable prestress, and steel beam section size. The established BP and SSA-BP model has the benefit of being applied in practice to support the BSS design. In addition, sensitivity analysis is conducted to investigate the significance of input variables. Research has shown that the deformation values predicted by the SSA-BP neural network are in good agreement with the sample values, and the error is relatively small compared to the predicted values of the BPneural network.

Keywords: *beam String Structure; BPNeural Network; Ssa-bp Neural Network; Deformation Prediction*

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The Role of Sustainable Materials in the Future of Art and Design: Challenges and Opportunities

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Abstract

As environmental concerns intensify globally, the art and design sectors are increasingly embracing sustainable materials to mitigate their ecological impact. This paper investigates the integral role of sustainable materials in the future of art and design, addressing both the challenges and opportunities they present. Initially, the study provides an exhaustive overview of sustainable materials, detailing their definitions, categories, and inherent benefits. It then examines the specific challenges encountered by artists and designers, including limited material availability, higher costs, and the technical complexities involved in integrating these materials into existing practices. Moreover, the paper explores the myriad opportunities that sustainable materials offer, such as fostering innovation, enabling new forms of artistic expression, and contributing to global sustainability objectives. By analyzing literature, conducting case studies, and interviewing industry experts, the research identifies effective strategies for incorporating sustainable materials into artistic and design processes. The study highlights successful examples where sustainable materials have been used innovatively, demonstrating their potential to revolutionize industry. The findings indicate that, despite significant obstacles, the transition to sustainable materials is not only feasible but also beneficial. It encourages innovation, supports environmental stewardship, and aligns with the increasing consumer demand for sustainable practices. The paper emphasizes the necessity of a multi-faceted approach to overcoming these challenges, advocating for increased investment in research and development, enhanced material sourcing channels, and comprehensive educational programs aimed at equipping artists and designers with the knowledge and skills needed to work with sustainable materials effectively. The conclusion offers actionable recommendations for artists, designers, educators, and policymakers. It stresses the importance of fostering collaborative networks, promoting interdisciplinary research, and implementing policies that support sustainable practices within the art and design sectors. By championing the use of sustainable materials, the art and design community can play a pivotal role in driving the broader agenda of environmental sustainability, while also expanding the boundaries of creative expression. This paper underscores that embracing sustainability is not merely a trend but a necessary evolution for the future of art and design, promising a more environmentally conscious and creatively rich industry.

Keywords: *Sustainable Materials; Art and Design; Innovation; Environmental Sustainability; Challenges and Opportunities*

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Educational Strategies for Promoting Sustainability Awareness in Materials Science and Engineering

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Abstract

In recent years, sustainability has emerged as a critical issue in materials science and engineering due to its impact on the environment, economy, and society. However, there is a notable gap in integrating sustainability principles into educational practices within this field. This study explores the development and implementation of educational strategies aimed at increasing sustainability awareness among students in materials science and engineering programs. By addressing this gap, the study seeks to contribute to the broader goal of fostering a culture of environmental responsibility and innovative problem-solving in the field. The study employs a mixed methods approach to evaluate the effectiveness of various educational strategies for promoting sustainability awareness. Quantitative methods include pre- and post-intervention surveys administered to students to measure changes in their sustainability knowledge and attitudes. Qualitative methods involve focus group discussions and interviews with students and faculty to gather insights into the perceived effectiveness of the educational strategies. The data collected is analyzed using statistical techniques to assess the significance of the interventions, and thematic analysis is used for qualitative feedback. The findings indicate that the implemented educational strategies significantly increased students' awareness of sustainability issues related to materials science and engineering. The quantitative data revealed a notable improvement in students' knowledge and attitudes towards sustainability, with statistically significant differences observed between pre- and post-intervention survey results. Qualitative feedback from focus groups and interviews highlighted the effectiveness of interactive teaching methods, such as case studies and project-based learning, in enhancing students' understanding of sustainability concepts. The study concludes that targeted educational strategies can effectively promote sustainability awareness among students in materials science and engineering. The results suggest that integrating interactive and experiential learning methods into the curriculum can lead to meaningful improvements in students' sustainability knowledge and attitudes. The study's findings have implications for curriculum development in materials science and engineering programs and provide a foundation for further research into innovative educational practices for sustainability.

Keywords: *Sustainability Awareness; Materials Science; Educational Strategies; Engineering Education*

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Innovative Approaches in Sustainable Design: Integrating Eco-Friendly Materials into Creative Arts

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Abstract

In the current era of environmental awareness, integrating sustainable practices within the realms of materials science and technology is imperative. This article delves into innovative approaches in sustainable design, focusing on the use of eco-friendly materials within the creative arts. By exploring the convergence of artistic creativity and sustainable development, this study aims to highlight how creative disciplines can lead the way in adopting and promoting sustainable materials. The discussion begins with an overview of the critical need for sustainability in material choices, emphasizing the environmental impact of traditional materials and the benefits of eco-friendly alternatives. It examines various sustainable materials, including biodegradable polymers, recycled composites, and natural fibers, detailing their properties, applications, and advantages in artistic and design contexts. Through a series of case studies, the article showcases pioneering projects where sustainable materials have been successfully incorporated into creative works. These examples illustrate the practical challenges and innovative solutions artists and designers employ to balance aesthetic appeal with environmental responsibility. The role of technology in enhancing the functionality and appeal of sustainable materials is also explored, demonstrating how advancements in materials science are making eco-friendly options more accessible and versatile. The theoretical framework of the study is grounded in sustainability principles, examining how life cycle analysis, circular economy models, and green certification standards can be integrated into the design process. The main problem addressed in this study is the significant environmental impact of traditional art materials, which often involve non-renewable resources, high energy consumption, and toxic waste. Evidence of this problem can be seen in numerous environmental reports indicating the depletion of natural resources and pollution linked to the production and disposal of conventional art supplies. For instance, the Environmental Protection Agency (EPA) has highlighted that art materials like oil paints, solvents, and synthetic brushes contribute to air and water pollution due to their chemical composition and disposal methods. Additionally, a report by the Ellen MacArthur Foundation shows that only a small fraction of materials used in the art industry are recycled, exacerbating waste issues. The findings underscore the potential of the creative arts to influence broader societal shifts towards sustainability. By leveraging their unique ability to engage and inspire, artists and designers can advocate for eco-friendly practices and educate the public about the importance of sustainable materials. This article calls for a sustained commitment to innovation in material science and design, urging the creative community to lead by example in the quest for environmental stewardship. Ultimately, the study concludes that integrating eco-friendly materials into creative arts not only enhances the sustainability of artistic practices but also contributes to the global effort to mitigate environmental degradation. The research highlights the transformative potential of sustainable design, advocating for a future where creative arts and environmental responsibility are inextricably linked.

Keywords: *Sustainable Design, Eco-Friendly Materials, Creative Arts, Environmental Impact, Biodegradable Polymers, Environmental Responsibility*

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From Art to Science: Bridging Fine Art and Material Science for Sustainable Artistic Innovation

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Abstract

The environmental impact of traditional art materials and practices is a growing concern within the fine arts community. Conventional materials, such as oil paints, synthetic polymers, and non-recyclable substrates, contribute to pollution, resource depletion, and waste. Despite increasing awareness, sustainable alternatives are not widely adopted, often due to a lack of understanding or access to advanced materials. This study aims to address the critical need for sustainable artistic practices by exploring the integration of advancements in material science, particularly biomaterials, ceramics, graphene technology, and advanced materials processing. This research employs a multidisciplinary methodology, encompassing a comprehensive literature review, case studies, and experimental applications. The literature review synthesizes existing research on sustainable materials and their potential applications in art. Case studies focus on contemporary artists who have successfully integrated advanced materials into their practices, providing evidence of their feasibility and benefits. Experimental applications involve creating original art pieces using these materials to assess their performance, aesthetic qualities, and environmental impact. Interviews with artists, material scientists, and industry experts offer insights into the practical challenges and opportunities of adopting these innovations. The findings highlight significant potential for sustainable innovation in the fine arts through the adoption of advanced materials. Biomaterials, such as biodegradable polymers and bioplastics, offer eco-friendly alternatives that reduce the environmental footprint of art production. Ceramics, known for their natural abundance and recyclability, present sustainable options for both sculptural and functional art. Graphene technology, with its exceptional strength and conductivity, introduces new possibilities for mixed-media and interactive art forms. Advanced processing techniques, including 3D printing and nanotechnology, enhance creative potential while promoting resource efficiency and waste reduction. The study concludes that integrating material science into fine art practices can significantly reduce environmental impact and promote sustainability. By adopting advanced materials, artists can achieve innovative and environmentally responsible art practices. The research underscores the importance of continued collaboration between artists and scientists to explore and develop sustainable materials and techniques. This interdisciplinary approach is crucial for addressing the environmental challenges faced by the art world and contributes to a broader movement towards sustainability in all creative disciplines.

Keywords: *Sustainable Art, Material Science, Biomaterials, Ceramics, Graphene Technology, Advanced Materials, Environmental Impact, Interdisciplinary Collaboration*

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AI-Driven Edge Computing Framework for Smart Healthcare Monitoring

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Abstract

In the field of medical sensor data analysis, a significant challenge is distinguishing between sensor malfunctions and anomalous patient readings within vast datasets. This research proposes the development of an algorithm within a body sensor network specifically aimed at detecting these types of outliers. We employ specific machine learning (ML) techniques, such as decision trees and support vector machines, alongside statistical sampling to optimize real-time responses as computational tasks become increasingly decentralized across IoT devices. The integration of task-level parallelism and distributed computing is crucial for managing data efficiently and conserving device battery life. Additionally, with the widespread deployment of IoT devices, enhancing data privacy and security is imperative. Our approach utilizes a hybrid model that combines edge and cloud computing within a distributed-edge- computing- based IoT framework to improve network responsiveness and security. By analyzing massive volumes of data collected by IoT sensors and employing ML at backend servers, we aim to extract critical data signatures that inform healthcare decisions. This study details methodologies including machine learning, statistical analysis, and distributed computing in a medical context, demonstrating how advanced computing architectures can transform data handling and analysis in healthcare.

Keywords: *AI in Healthcare; Edge Computing; Smart Healthcare; IoT Healthcare Solutions; Remote Patient Monitoring*

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Greener Materials in Vernacular Architecture: A Multidisciplinary Approach to a Sustainable Built Environment

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Abstract

The paper explores the integration of modern sustainable technologies with vernacular architecture to enhance the built environment's sustainability. It examines advancements in green materials, construction techniques, and their applications in vernacular architecture, offering a multidisciplinary perspective on creating resilient, energy-efficient, and culturally relevant buildings. It explores how vernacular architecture, a sustainable practice that uses locally available materials and techniques, can be adapted to modern sustainability goals by integrating greener materials and climate responsiveness principles. One key area of focus is the use of sustainable building materials. Traditional materials such as bamboo, timber, rammed earth, and adobe have long been used in vernacular architecture due to their local availability, renewability, and minimal environmental impact. Recent advancements in materials science have further enhanced these materials' potential by improving their structural properties, durability, and insulation capabilities. For instance, cross-laminated timber (CLT) and engineered bamboo offer higher strength and flexibility, making them suitable for modern construction while retaining the ecological benefits of traditional materials. Another significant area is the development of innovative construction techniques that reduce environmental impact while maintaining the aesthetic and cultural integrity of vernacular architecture. Prefabrication and modular construction methods, for example, can be adapted to traditional designs, reducing waste and construction time. Additionally, emerging technologies like 3D printing can utilize local materials to recreate traditional architectural forms with precision and efficiency, offering a blend of innovation and tradition. The integration of renewable energy systems within vernacular architecture is also explored. Solar photovoltaic panels, passive solar design, and small-scale wind turbines can be seamlessly incorporated into traditional buildings, providing clean energy without disrupting the architectural integrity. These renewable energy solutions not only reduce the carbon footprint of buildings but also enhance their resilience and self-sufficiency. Water management systems, crucial for sustainable living, can be effectively integrated with vernacular architecture. Traditional practices like rainwater harvesting and the use of step wells and cisterns can be enhanced with modern filtration systems to ensure a clean water supply. Similarly, the use of green roofs and permeable pavements can reduce runoff and enhance groundwater recharge, blending seamlessly with the traditional aesthetics. This paper presents case studies to illustrate successful integration of greener materials and technologies with vernacular architecture. Examples such as the Earth ship movement and the ZERI Pavilion demonstrate how traditional building methods can be combined with modern sustainable technologies to create self-sufficient, environmentally friendly structures. These case studies highlight the potential for scalable and adaptable solutions across different regions and contexts. In conclusion, integrating greener materials with vernacular architecture offers a promising pathway to a sustainable built environment. By adopting a multidisciplinary approach that respects cultural heritage while embracing modern innovations, it is possible to create buildings that are environmentally sustainable, economically viable, and socially beneficial. This research underscores the need for continued collaboration and innovation in developing sustainable technologies that enhance the resilience and sustainability of vernacular architecture, contributing to a greener future for all.

Keywords: *Vernacular Architecture; Greener Materials; Sustainable Built Environment; Renewable Energy Integration; Innovative Construction Techniques*

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From Waste to Resource: Fit-for-Purpose Materials for a Circular Economy

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Abstract

The way we use resources harms the environment, and it is time for change. Embracing a circular economy is a crucial step towards a more sustainable future, where resources overall are seen as assets rather than unutilized parts considered as waste. In this perspective, utilizing unconsumed raw materials according to specific needs would produce another stream of commercially viable products or fit-for-purpose materials. In this article, we will consider the concept of "fit for purpose" material, designed to meet specific practical requirements rather than just a waste treatment. We'll explore the principles behind this approach, the challenges that come with it, and the opportunities it presents. By turning waste into fit-for-purpose materials, we can reduce our environmental impacts, foster innovation, and create a more resilient economy. This presentation is a brief on the reuse of waste materials, followed by elaboration on specific research stories on converting biomass waste into value-added carbon-rich products. These materials can potentially change how we live and work if we can develop suitable thematic materials in a circular economy model to create a better future for all.

Keywords: *Fit-for-purpose Materials; Biowaste; Carbonaceous Compounds; Water Purification; Energy Storage; Textile Industry*

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The Part Design of a Novel Bussed Electrical Center for China Electric Vehicle Traction Battery

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Abstract

In terms of Battery Electric Vehicle (BEV), fire risk in connection with high voltage (HV) traction battery is one of the biggest threats to vehicle safety. One effective means of attenuating battery fire risks is to decrease the possibility of battery thermal runaway. And battery thermal runaway mainly is caused by overcurrent through battery HV circuitry. How to reduce, eliminate and prevent overcurrent events? The novel Bussed Electrical Center (BEC) in this research is one of the most promising solutions to this puzzle. Typically, BEC is one important module located inside HV traction battery. It connects HV traction battery to vehicle loads so that the HV electrical power can be supplied from traction battery to vehicle. Also, BEC disconnects HV traction battery with vehicle loads when the vehicle is turned off or unexpected events occur. If the capability of disconnecting traction battery power to loads can be improved to cut off electrical current in a super short time, any overcurrent event will be stopped instantly, and it will not last long. Therefore, the amount of generated heat will not be large enough to lead to battery thermal runaway. The Novel BEC is inspired by this assumption. This research paper presents the design of novel BEC that builds on the existing Battery Disconnect Unit (BDU) technologies but expands the contents by incorporating Automative Safety Integration Level (ASIL) C rated current sensor, active & passive pyrotechnic fuse and anti-welding HV contactors. To complete the novel BEC design, software Computer Aided Three-dimensional Interactive Application (CATIA) is utilized for creating geometric structure and 3D model, and the software FLOTHERM is used for simulating and analyzing the thermal performance including heat generation and heat rejection. Matlab is employed for electrical circuity design. The finding shows that the novel BEC design brings some positive effects on BEV traction battery technologies. It primarily could reduce the frequency of BEV fire incidents by preventing battery thermal runaway that arises out of overcurrent events. Furthermore, the warranty cost related to BEC for both auto makers and consumers would be reduced because the novel BEC will have less contactor failures related to contacts welding.

Keywords: *Battery Electric Vehicle; Traction Battery; Fire Risk; Bussed Electrical Center; Battery Disconnect Unit*

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Study on the Antidiabetic Nephropathy Therapeutic Effect of Piceatannol via the ERK1/2 Pathway

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Abstract

Objective: To explore the renal protective effect exerted by Piceatannol (PIC) on diabetic nephropathy (DN) rats and its influence on the expression of heme oxygenase-1(HO-1), hypoxia inducible factor-1α(HIF-1α), the extracellular regulatory protein kinase-1/2 (ERK1/2) and its regulated connective tissue growth factor (CTGF) protein. Methods: Healthy male SD rats were provided with a high-fat and high-sugar diet along with intraperitoneal injection of streptomycin to establish the DN model. Fifty SD rats were randomly categorized into the model group (DN group), low dose (50mg/kg), medium dose (100mg/kg), and high dose (200mg/kg) PIC groups, with 10 rats in each group. Additionally, 10 rats were selected and maintained on a normal diet as the normal control group. All groups were administered the drug upon successful model establishment. The low, medium, and high dose PIC groups were administered the corresponding doses of PIC via intragastric administration, respectively, while the normal control group and the DN group were administered 10 ml/kg of normal saline via intragastric administration. Each group of rats received the drug once daily for 4 weeks. The dietary conditions of the rats were observed during administration. Twelve hours after the final administration, the rats were weighed, their urine was collected, the rats were sacrificed under anesthesia, and blood from the abdominal aorta and kidney tissue was collected. Serum creatinine (Scr), serum urea nitrogen (BUN), fasting blood glucose, 24-hour urine protein, and fasting blood glucose (FBG) were measured using the enzyme- linked immunosorbent assay (ELISA). Kidney tissue was obtained, weighed, and the pathological morphology of the kidney tissue was evaluated through hematoxylin-eosin staining. The activity of superoxide dismutase (SOD) and the content of malondialdehyde (MDA) in renal tissue were determined by the xanthine oxidase method and the thiobarbiturate method. The relative expression levels of HIF-1α,HO-1, ERK1/2, and CTGF were detected by Western Blot. Results: Compared with the normal control group, the rats in the DN group exhibited severe pathological injuries such as listlessness, emaciation, thickening of the glomerular basement membrane, dilation of renal tubules, and inflammatory infiltration of the renal interstitial. The kidney/body mass index, FBG, serum Scr and BUN, 24-hour urinary protein content, MDA content, expression of HIF-1α, HO-1, P-ERK1/2, and CTGF protein in kidney tissue were elevated ($P < 0.05$), while the SOD activity was significantly reduced ($P < 0.05$). Compared with the DN group, the pathological damage of the kidney was alleviated in the PIC treatment group, and the kidney/body mass index, FBG, serum Scr and BUN, 24-hour urinary protein content, MDAcontent in kidney tissue, expression of HIF-1α, ERK1/2, and CTGF protein were decreased ($P < 0.05$). The activities of HO-1 and SOD were significantly increased ($P < 0.05$), and these indicators were dose-dependent in each dose group of PIC. Conclusion: PIC can suppress the activation of the ERK1/2-CTGF signaling pathway, enhance the expression of HO-1, reduce the expression of HIF-1α, inhibit the oxidative stress injury of the kidney, and ameliorate the kidney injury in DN rats.

Keywords: *Piceatannol; Diabetic Nephropathy; Extracellular Regulatory Protein Kinase-1/2 Pathway; Connective Tissue Growth Factor*

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Effect of Orientation and Wetting on Crystallization Behavior of PEG-b-PCL Ultrathin Film

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Abstract

This study provides an in-depth analysis of the effects of orientation and wetting on the crystallisation behaviour of polyethene glycol-polycaprolactone block copolymer (PEG-b-PCL) ultrathin films. The research background emphasises the importance of multi-level ordered transformations in the control of material physical properties during the polymer crystallisation process and also points out the constraints of the complexity of the crystal structure on theoretical development. Ultrathin film technology provides a new perspective for an in-depth understanding of crystallization theory by determining the direction of polymer chains. The experimental part describes in detail the method of preparing ultrathin films on mica substrates using PEG-b-PCL solutions prepared in dichloromethane and using different spin coating rates. The crystal morphology, structure and lamellar thickness of the ultrathin film were systematically characterized using atomic force microscopy (AFM) and differential scanning calorimetry (DSC). The research results reveal the significant promotional effect of orientation on copolymer crystallization. Non-oriented samples show heterogeneous crystal structures, including dendritic aggregate structures and droplet-like amorphous aggregates. The oriented sample exhibits a more uniform lamellar thickness and crystal structure, as well as round pores formed due to dewetting, indicating that crystallization mainly occurs during the dewetting stage. DSC analysis shows that the oriented sample has a higher melting point, indicating a more complete crystal structure. The rightward shift of the heating curve further confirms that the orientation effect promotes the crystallization process. AFM analysis revealed changes in the morphology of ultra-thin film crystals under different orientation speeds. As the orientation speed increases, the dewetting pore size increases until it disappears, and the crystal morphology changes from porous lamellae to dendrites. The influence of orientation rotation speed on lamellae thickness shows that as the rotation speed increases, the lamellae thickness shows an increasing trend, with an increase of 45.3%. This reflects the improvement in the ability of molecules to move along the orientation direction, promotes crystallization phase transformation, makes the crystal more perfect, and has more stable thermodynamic properties. The conclusion highlights the ability to effectively control the crystal structure and morphology of ultrathin films by adjusting the orientation speed. Research shows that as the orientation speed increases, the thickness of the lamellae increases, the dewetting pore size increases until the holes disappear, and the crystal morphology changes. This study provides a new perspective for the understanding of the crystallization behaviour of polymer ultrathin films and provides important experimental data and theoretical support for applications in the field of thin film crystallization.

Keywords: *PEG-b-PCL; Ultrathin Film; Orientation; Lamellar Thickness*

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Innovations in Sustainable Construction: Investigating the Properties and Application of High- Performance and Light-Weight Concrete

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Abstract

The construction industry is at a pivotal juncture, balancing the need for global development with the imperative to minimize environmental impacts. This research delves into the fundamental principles and practical applications of high-performance, lightweight concrete as a sustainable solution for modern construction challenges. While traditional citation-context models have been used to create scientific summaries, they often lack the nuanced context needed to fully represent the cited work. This research approach integrates these models with the content of the paper, providing a more comprehensive understanding of the research. The study's evaluation dataset, derived from the construction industry, demonstrates that the principles and techniques the researcher propose are broadly applicable across various fields. High-performance, lightweight concrete offers numerous benefits, including reduced carbon emissions, enhanced thermal insulation, increased durability, and lower weight. These attributes make it a promising material for sustainable building practices. Significant examples of its application include the 3D- printed concrete bridge in Amsterdam and the Bosco Verticale in Milan, showcasing its potential to revolutionize construction methods. To fully realize the advantages of this technology, the industry must invest in research, secure regulatory support, promote education, and engage stakeholders. This study underscores the urgent need for sustainable alternatives to traditional construction methods. By adopting high-performance, lightweight concrete, the industry can significantly reduce its environmental footprint while meeting the increasing demand for urban development. Our findings advocate for a balanced approach that fosters growth while prioritizing environmental stewardship.

Keywords: *Advanced Concrete Mix; Carbon Footprint; Ecological Imprint; High-Performance and Lightweight; Concrete; Innovative Materials*

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An Examination of a First-Year Kindergarten Teacher's Conceptions and Use of Multiple Literacies Curriculum Design for an Online Kinder Garten

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Abstract

Due to the possibility that schools would be forced to make a temporary transition to online learning in the case of future worldwide pandemics, it was of the utmost importance to provide kindergarten teachers with the necessary instructional approaches. These methods include the utilisation of contemporary resources and technology in online classrooms. As a result of the possibility that schools may be required to implement this modification, this was the situation. The purpose of this study was to investigate the ways in which instructors at Full-day kindergarten (FDK) are using digital tools that are based on screens in their courses in order to assist students in learning digitally in a manner that is successful, meaningful, and relevant. Regarding the use of digital tools and technology that are based on screens in the classroom, what are the feelings of FDK teachers? Using digital technologies that are focused on the screen, how can instructors at FDK record the progress that students are making in their online courses? A combination of qualitative and quantitative research methods was used in order to study all of these and other relevant topics. It was possible that those who offer FDK programmers online in the future would find the results of this research to be helpful. Future research on the use of digital resources, games, and activities in the classroom should have as its major purpose the enhancement of students' learning, memory, understanding, and capacity to make connections between different topics.

Keywords: *Kindergarten; Remote Learning; Technology; Virtual Learning; Virtual Teaching*

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A Study to Find out the Steatotic Liver Disease Linked to Metabolic Dysfunction an Expansive View on a Complex Issue

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Abstract

Nonalcoholic fatty liver illness (the condition), which affects over 25% of the global population and over 60% of those at elevated risk, is becoming more and more common. It increases the risk of developing certain conditions linked to the liver and cardiovascular system as part of the metabolic syndrome. A multidisciplinary approach is necessary for the treatment of NAFLD because of the disease's complexity and the comorbidities and problems that often accompany it. However, there is a lack of knowledge Concerned among several experts on the gravity and potential consequences of fatty liver disease that is not alcoholic, as well as its comorbidities, consequences, and the necessary actions to take if NAFLD is detected. People with actively metabolising non-alcoholic steatosis (NASH) who have cirrhosis, inflexible simple steatosis, hepatocellular carcinoma, and cardiovascular disease must be identified. Unfortunately, there are conflicting recommendations for the best diagnostic and treatment methods, and this may be a challenging task. Here, we take a look back at NAFLD's origins, diagnoses, and treatment options before moving on to a discussion of potential future directions for multidisciplinary care path development.

Keywords: *Steatotic Liver; Disease; Metabolic Dysfunction; Diagnostic*

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A Study to Analyse Accounting for Stock-Based Compensation Plans

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Abstract

Plans for stock-based compensation have grown in importance in contemporary business pay systems as a means of motivating, retaining, and attracting new hires. The purpose of this research is to thoroughly examine how stock-based compensation schemes are treated in accounting and how this affects financial reporting procedures. Using a mixed-methods approach, the study combines qualitative insights from interviews with industry experts and accounting professionals with a quantitative examination of financial data. "Accounting treatment for incentive compensation plans," the dependent variable, is compared to many independent variables, such as the kind of compensation plan, vesting periods, worker characteristics, industry and size of the company, regulatory environment, financial performance of the company, and market conditions. This study advances our knowledge of how organizations evaluate, record, and disclose these plans in financial statements by examining the several elements that impact those choices.

Keywords: *Regulatory Compliance; Stock-Based Compensation; Accounting Treatment; Financial Reporting*

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The Study to Teaching and Learning English as a Foreign Language; Developing Learner Autonomy, Tesol Materials Development and Reflective Teaching on Chinese University Students and English Teachers

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Abstract

The most recent spate of English curriculum modifications in China has emphasized enhancing students' learning autonomy, according to the Ministry of Education (MOE). Improving students' English proficiency was the primary goal of developing the new rules. This was done to better enable them to complete their basic education, which is nine years of compulsory university. But little has been learned about how well children are taught fundamentals and how they grow in their ability to study independently until now. Examining the correlation between students' learner autonomy growth at the university level and the various places they attended during their basic education, this research takes the English language topic as an example. With language instruction on the increase and the need for English instructors in China constantly growing, this article seeks to investigate if Chinese TESOL learners who have received their training in the US and UK adjust to teaching English in Chinese classrooms. The growing number of international interactions has contributed to the expansion of language education, according to this article. Since English is spoken all across the globe, it stands to reason that progress in English language instruction has a direct bearing on the rate of globalisation. It finds that TESOL places a premium on educating instructors' capacity to teach in the classroom. Both a philosophy of teacher training and a movement within the field of international teacher education, "reflective teaching" seeks to improve educators' capacity for reflective practice in the classroom. This strong teaching trend has been impacting education practices worldwide, and it has grown out of studies of the moral duty of teaching and the actual results of teaching strategies.

Keywords: *Development; Learner Autonomy; Reflective Teaching; Tesol Materials*

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A Study to Explore the Perceptions of Multiliterate Assignments Using 21st-Century Technologies among University Students and Teachers in China

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Abstract

To become successful in the modern age, learners need to know more than just the facts; they need to know how to apply that knowledge. The introduction of the Common Core State Standards has placed an emphasis on educational methodology that aims to adequately educate students for their futures in university or careers in the secondary classroom. In this study, the author details research that looked at how university English instructors and students felt about using multiliterate projects to educate students on 21st-century abilities. The justifications, key terms, methods, findings, and conclusions of the research are all laid forth in this study. The goals of this study were to examine the following: the extent to which students and instructors' perceptions of the use of 21st-century skills in multiliterate assignments reflect reality; the presence or absence of such skills in such assignments; and the consequences of students' and instructors' perceptions of the use of such skills on their understanding of course material. The purpose of this qualitative research is to examine whether educators and students perceive that multiliterate tasks promote the development of abilities necessary for success in the modern world. Teachers and students alike have shown via surveys and self-reflection that multiliterate tasks help students use the four primary 21st-century skills necessary for success in further education, the workplace, and life. Students' readiness for the world beyond university may be enhanced with the use of multiliterate tasks in English classes, according to this study.

Keywords: *Chinese University; Multiliterate Assignments; Students; Technologies*

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A Study to Evaluate the Academic Performance of University Students and Their Parents' Socio-Economic Status in China

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Abstract

The study aims to identify patterns and correlations between students' academic achievements and various SES indicators, including income, education level, and occupation of parents. This study evaluates the academic performance of university students in China in relation to their parents' socio-economic status (SES) using a quantitative research method. Data is collected from a sample of university students across different regions in China through structured questionnaires and academic records. The analysis employs statistical techniques such as correlation and regression analysis to examine the relationship between SES and academic performance. Preliminary findings indicate a significant positive correlation between higher parental SES and better academic outcomes. Students from higher SES backgrounds tend to have access to more educational resources, better learning environments, and greater parental support, which contribute to their academic success. Furthermore, the study explores the impact of specific SES components on academic performance. Parental education level emerges as a critical factor, with students whose parents have higher educational qualifications performing better academically. Income and occupation also show significant, albeit slightly weaker, correlations with academic performance. The study's findings underscore the importance of addressing socio-economic disparities to promote educational equity. Policy implications suggest the need for targeted interventions to support students from lower SES backgrounds, such as financial aid, tutoring programs, and parental engagement initiatives. By highlighting the link between SES and academic performance, this research contributes to the broader understanding of educational inequalities and informs strategies to enhance academic outcomes for all students.

Keywords: *Academic Performance; Students; Parents' Socio-economic Status; Chinese University*