PRME
an initiative of the
United Nations Global Compact

UBT
جامعة الأعمال و التكنولوجيا
UNIVERSITY OF BUSINESS AND TECHNOLOGY

2025 Sharing Information on Progress **(SIP) Report**

University of Business and Technology

October 2025

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About the Principles for Responsible Management Education (PRME)

The Principles for Responsible Management Education (PRME) is a United Nations-supported initiative founded in 2007 that aims to raise the profile of sustainability in their classrooms through Seven Principles focused on serving society and safeguarding our planet.

PRME engages business and management schools to ensure they provide future leaders with the skills needed to balance economic and sustainability goals, while drawing attention to the Sustainable Development Goals (SDGs) and aligning academic institutions with the work of the UN Global Compact. Driven by its mission to transform management education, PRME equips today's business students with the understanding and ability to deliver change tomorrow. As a voluntary initiative with over 800 signatories worldwide, PRME has become the largest organized relationship between the United Nations and management-related higher education institutions.

> *The PRME initiative was launched to nurture responsible leaders of the future. Never has this task been more important. Bold leadership and innovative thinking are needed to achieve the Sustainable Development Goals (SDGs).*

Antonio Guterres

Secretary-General (2017 - Present)

United Nations

Principles of PRME

Purpose

We advance responsible management education to foster inclusive prosperity in a world of thriving ecosystems.

Values

We place organizational responsibility and accountability to society and the planet at the core of what we do.

Teach

We transform our learning environments by integrating responsible management concepts and practices into our curriculum and pedagogy.

Research

We study people, organizations, institutions, and the state of the world to inspire responsible management and education practice.

Partner

We engage people from business, government, civil society, and academia to advance responsible and accountable management education and practice.

Practice

We adopt responsible and accountable management principles in our own governance and operations.

Share

We share our successes and failures with each other to enable our collective learning and best live our common values and purpose.

The Sustainable Development Goals (SDGs)

In September 2015, all 193 Member States of the United Nations adopted a plan for achieving a better future for all – laying out a path over the next 15 years to end extreme poverty, fight inequality and injustice, and protect our planet. At the heart of Agenda 2030 are 17 Sustainable Development Goals (SDGs) and 169 related targets that address the most important economic, social, environmental and governance challenges of our time. The SDGs clearly define the world we want – applying to all nations and leaving no one behind. Successful implementation of the SDGs will require all players to champion this agenda; the role of higher education is critical to this.

Getting Started

This section provides foundational information about University of Business and Technology, including key details and basic institutional data.

Mission

To contribute to society through the pursuit of high quality market-driven undergraduate and graduate programs and executive education that prepare competent professionals, future leaders, and entrepreneurs, and applied research with tangible impact on the economy and community.

Vision

To be a leading university nationally and recognized internationally in education and research for the advancement of society.

Strategy Alignment

Strategy Alignment

At UBT, our strategic priorities are closely aligned with advancing sustainable development, promoting the common good, and delivering quality education. Sustainability is one of the university's three foundational pillars, embedded not only in campus operations but also throughout the curriculum, research agenda, and community engagement initiatives. Our market-driven academic programs are designed to equip students with the skills and mindset needed to address real-world challenges, including those related to social responsibility, environmental stewardship, and economic resilience—directly contributing to the UN Sustainable Development Goals (SDGs). Through transformative student experiences, applied research with tangible impact, and strong partnerships with industry and the community, UBT ensures that education serves both individual advancement and the broader needs of society. Our commitment to values such as integrity, responsibility, and excellence reinforces our role in fostering ethical leaders who can contribute meaningfully to the common good and sustainable future.

Graduates & Enrollment

2024 Statistics	Number
Graduates	890

2024 Statistics	Number
Faculty & Staff at the University	405
Faculty & Staff at the Institution	405
Student Enrollment at the University	5387
Student Enrollment at the Institution	5387
Undergraduate Attendance	4690
Masters-Level Postgraduate Attendance	697
Doctoral Student Attendance	35
Certificate, Professional Development, or Continuing Education Attendance	650

Degrees Offered

Bachelor Programs

- Bachelor on Science in Accounting
- Bachelor of Law
- Bachelor of Science in Finance
- Bachelor of Science in Human Resources
- Bachelor of Science in Marketing
- Bachelor of Science in Hospitality and Tourism
- Bachelor of Science in Insurance and Risk Management
- Bachelor of Science in Sports Management
- Bachelor of Science in Retail Management
- Bachelor of Science in Supply Chain Management
- Bachelor of Science in Business Analytics and Information Management
- Bachelor of Science in Industrial Engineering
- Bachelor of Science in Civil Engineering
- Bachelor of Science in Electrical Engineering
- Bachelor of Science in Mechanical Engineering
- Bachelor of Science in Software Engineering
- B.Sc. in Architecture
- B.Sc. in Safety Engineering
- B.Sc. in Advertising Communication
- B.Sc. in Advertising Management
- B.Sc. in Creative Advertising Design

Masters Programs

- M.Sc. in Supply Chain Management
- M.Sc.in Advertising
- Master of Law
- Master of Business Administration (MBA)
- Master of Engineering Management (MEM)
- M.Sc. in Accounting
- M.Sc. in Finance
- M.Sc. in Marketing
- M.Sc. In Human Resources Management

Doctoral Programs

- Doctor of Philosophy (Ph.D.)

Purpose

We advance responsible management education to foster inclusive prosperity in a world of thriving ecosystems.

Definition of Purpose

At UBT, we define Purpose as preparing responsible leaders who create value not only for organizations but also for communities and the environment, fostering inclusive prosperity and thriving ecosystems in line with Vision 2030 and global sustainability goals.

Institutional Engagement

76% - 100% of faculty at University of Business and Technology actively contribute to our work with PRME, advancing responsible management education, or addressing sustainable development challenges through their work.

Values

We place organizational responsibility and accountability to society and the planet at the core of what we do.

How We Define Values

At UBT, Values mean integrity, respect, sustainability, and accountability principles that shape our culture, curriculum, and partnerships to drive positive impact for both people and the environment

Who Champions Responsible Management Education at Our Institution

- Interdisciplinary efforts across parent organization
- Centralized sustainability office
- Research or issue group, society, or club leading sustainability efforts
- Student contributor

Student Voices

The following narrative demonstrates how University of Business and Technology has influenced students' academic journey and personal growth.

Student Perspective: Embedding PRME in Everyday Learning at UBT

As a student at the University of Business and Technology (UBT), I've seen firsthand how PRME shapes both classroom learning and extracurricular activities. Faculty actively encourage students to go beyond theory—for example, one of my peers is currently writing a sustainability-focused research paper with faculty support. These experiences show how responsibility and sustainability are becoming part of our academic foundation.

The Sustainability Club, restructured this year under the model R.A.I.S.E. (Research, Awareness, Initiatives, Systems, Everyone), reflects this commitment in practice. The model divides members into teams that mirror real organizational functions:

- **Research Team** develops data-driven projects (e.g., water-from-air solutions, carbon reduction) and produces research reports and articles.
- **Awareness Team** creates campaigns online and on campus, using creative content, posters, and short videos to make sustainability accessible.
- **Initiatives Team** organises hands-on events such as book swaps, recycling drives, and "No Paper Day," turning sustainability into daily practice.
- **Systems Team** manages accountability—recruitment, attendance, digital records, and member recognition—ensuring the club operates effectively.

Workshops also extend the reach of PRME. One session on our Career Day, **"The Future is Green: Sustainable Careers for a Changing Planet,"** helped students connect their career paths to sustainability trends and opportunities. Even simple initiatives, like recycling bins across campus, reinforce the message that sustainability is not abstract but part of everyday behaviour.

Through these experiences, PRME has influenced the way I approach research, manage people, and view my own academic journey. At UBT, responsible management education isn't just discussed—it's lived through student-led initiatives, faculty support, and real engagement with sustainability challenges.

Student Awareness

0% - 25% of students at University of Business and Technology are aware that we are a PRME Signatory Member.

Student Engagement

51% - 75% of students at University of Business and Technology actively contribute to our work with PRME, advancing RME, or addressing sustainable development challenges through their work.

Teach

We transform our learning environments by integrating responsible management concepts and practices into our curriculum and pedagogy.

How We Define Teach

Teach, in this context, means embedding sustainability and responsible management principles into teaching to shape knowledge, skills, and values. At our institution, it involves redesigning curricula, fostering interdisciplinary learning, and using experiential methods that prepare students to lead responsibly in complex, real-world environments.

Courses that support RME

University of Business and Technology reports 1 course in 2024 that support responsible management education and sustainable development goals.

UI/UX Design

BAIS 425

The objectives of this course are to ensure that students understand what user experience (UX) and user interface (UI) mean, why and how they matter, how to approach UX and usability, and how to approach UI design for business systems. The course aims to provide students with practical skills in the design of information systems, web and mobile applications.

Integrating Education for Sustainable Development (ESD) principles into the UI/UX design course aligns with UBT's strategic goals of promoting sustainability and social responsibility. By embedding these principles, students can design user-centered interfaces that address any of the 17 SDG goals to benefit society. This approach enhances technical and creative skills, fosters ethical design practices, and equips graduates to create innovative solutions that align with societal and environmental priorities.

Educator Recognition

At University of Business and Technology, we recognize educators for quality of teaching in the following ways:

- Annual teaching excellence awards
- Institutional recognition events
- Professional development opportunities
- Publication or research support

Fostering Innovation

A lot
Our institution supports innovation significantly through teaching and learning.

Experiential Learning

A lot
Our institution supports experiential learning significantly through teaching and learning.

Learning Mindset

A lot
Our institution supports a lifelong learning mindset significantly through teaching and learning.

Method of Teaching and Learning

In person
Traditional classroom-based learning with face-to-face instruction.

Barriers to Innovative Curriculum

In 2024, University of Business and Technology identified the following barriers to innovating, updating, or taking risks in existing curriculum:

- Resources Limitation
- Faculty expertise gaps
- Measurement and benchmarking issues

Barriers to Innovative Pedagogy

In 2024, University of Business and Technology identified the following barriers to innovating, updating, or taking risks in existing pedagogy:

- Change resistance

- Limited faculty development opportunities

Research

We study people, organizations, institutions, and the state of the world to inspire responsible management and education practice.

How We Define Research

We define Research as a purposeful inquiry that explores people, organizations, institutions, and global challenges to generate knowledge that is both academically rigorous and socially relevant. At our institution, research is guided by the commitment to responsible management and sustainable development, ensuring that findings not only contribute to theory but also inform practice, shape policies, and provide solutions that benefit business, society, and the planet

Research vs Research for RME/Sustainable Development

891 Peer-reviewed articles were published by University of Business and Technology from this past calendar year.

vs

21 Peer-reviewed articles were published by University of Business and Technology from this past calendar year in support of RME.

Research Funding

In 2024, University of Business and Technology was awarded funding for research that is:

Local **Regional** **National** **International**

Socializing Research

In 2024, University of Business and Technology contributed research findings to:

- Community organizations
- Open-access platforms

Research Projects

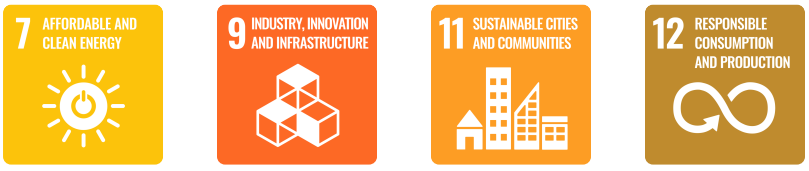
In 2024, University of Business and Technology reported 2 research projects that implemented responsible or sustainable activities.

Noor Al-Alam: Powering tomorrow from your Windoows Today: Pioneering Nono-technology for Global Solar innovation from Saudi Arabia

Period Covering: December, 2024 - December, 2025

Department: Computer Information Systems | Economics

This research project is on third-generation solar cells, highlighting the transformative potential of nanotechnology in advancing renewable energy solutions. By utilizing advanced nanomaterials such as zinc oxide (ZnO) nanowires and nanowalls, quantum dots (including lead sulfide and perovskite), and graphene, the study develops highly efficient, flexible solar cells that can be integrated into everyday surfaces like windows and vehicle panels. These nanostructures enhance light absorption, electron transfer, and energy conversion efficiency while remaining cost-effective and scalable. Collaborations with international institutions, particularly the University of Lille, have supported the development of flexible substrates and graphene-based electrodes, pushing the boundaries of solar innovation. This research also explores natural materials, such as proteins from jellyfish and coral, to improve solar performance. The applications of this technology are revolutionary, enabling glass surfaces to function as transparent, energy-generating platforms that align with Saudi Arabia's Vision 2030 goals for sustainability and energy diversification. The research has been recognized globally through prestigious awards and publications, reinforcing its scientific, economic, and societal significance. Ultimately, this work positions Saudi Arabia as a leader in solar nanotechnology and offers a model for integrating innovative science into practical, sustainable development.



Fostering Refugee Resilience Book

Period Covering: December, 2023 - December, 2024

Department: Research

In a significant contribution to global knowledge-sharing and community service, Dr. Basma El Zein, Director General of TechnoValley at the University of Business and Technology (UBT), launched the book "Fostering Refugee Resilience: Global Perspectives on Integration, Inclusion, and Prosperity," during a high-level event at the headquarters of the United Nations High Commissioner for Refugees (UNHCR) in Geneva, in the presence of Her Excellency Ms. Ruben Menikdiwela, the UNHCR's assistant high commissioner for protection .

Published by Emerald Publishing, this interdisciplinary volume brings together contributions from leading universities and research institutions in Spain, Mexico, United States, North Macedonia, Australia and Nigeria, as well as insights from parliamentarians representing Malta, Colombia, India, and North Macedonia, and global experts from UN agenciessuch as UNHCR and UNITAR-CIFAL. The publication serves as a global reference for inclusive strategies supporting refugee integration, resilience, and sustainable development.

The book is structured into six thematic sections:

1. Ethical and Legal Frameworks – addressing the moral foundations and international legal structures protecting refugees and displaced persons.
2. Regional Challenges and Case Studies – exploring experiences from North Macedonia, Mexico, Greece, and other regional contexts through cultural and policy lenses.
3. Innovation, Technology, and Education – highlighting how digital inclusion, literacy, and scalable innovation empower refugee communities.
4. Economic Contributions and Entrepreneurship – discussing the role of refugees and migrants as local economic actors and entrepreneurs.
5. Social Inclusion and Reintegration Strategies – focusing on perceptions of belonging, reintegration of returnees, and community cohesion.
6. Gender, Family, and Social Dynamics – reflecting on the lived experiences of migrant women and family structures in host societies.

Moderating one of the expert roundtables, Dr. El Zein underscored the vital role of higher education, applied research, and community-based innovation in crafting effective solutions for refugee inclusion. The event reflected UBT's deep-rooted commitment to community service, social impact, and academic diplomacy, while aligning with the UN Sustainable Development Goals (SDGs)—particularly those related to peace, quality education, and reducing inequality.

The event brought together a broad spectrum of international stakeholders, including officials from the United Nations University for Peace, UNESCO, ILO, UNDP, ITU, WTO, ITC, and WHO, further underscoring the United Nations' cross-sectoral commitment to refugee resilience.

A particularly moving part of the program featured refugee entrepreneurs, who shared personal stories of displacement, resilience, and reinvention—transforming pain into purpose. Their powerful testimonies offered human-centered narratives that emphasized the potential of inclusive policy frameworks.

The book is now being introduced to academic institutions, research libraries, and policy forums worldwide. During the event, it was formally offered to both UNHCR and UNESCO for inclusion in their institutional libraries, ensuring its accessibility as a global resource on refugee resilience, integration, and inclusive development. https://www.emerald.com/insight/publication/doi/10.1108/9781836089681

Research Awards

In 2024, University of Business and Technology was awarded 1 research award for responsibility- and/or sustainability-related research.

Makkah Excellence Award

Granter: Makkah Excellence Award

Grantee: University of Business and Technology

Award Description:

The University of Business and Technology (UBT) has been honored with the prestigious (Makkah Excellence Award)in the Environment category, recognizing its groundbreaking research in solar cell technology and its commitment to advancing renewable energy innovation. The Makkah Excellence Award, established under the patronage of the Emir of Makkah Region, celebrates outstanding achievements that contribute to the region's development and align with national goals, particularly in areas such as sustainability, innovation, and community impact. UBT’s pioneering work in developing third-generation solar cells—featuring zinc oxide nanowires and nanowalls, quantum dots, graphene, and natural proteins from jellyfish and coral—has set a new benchmark in clean energy research. These flexible and efficient solar solutions support Saudi Arabia’s Vision 2030 and the global transition toward sustainable energy. This recognition underscores UBT’s leadership in environmental innovation and its dedication to impactful, forward-looking scientific research.

Research Presentations Related to RME and/or Sustainability

In 2024, University of Business and Technology gave 1 research presentation related to RME and/or sustainability.

60th International Universities Power Engineering Conference (UPEC 2025)

| DOI

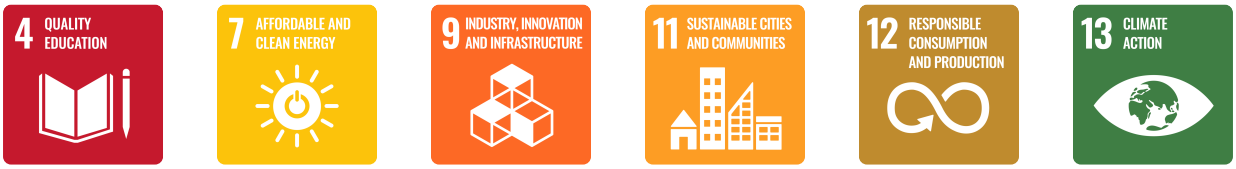
Authors: Dr. Mohammed Alqarni

Date of publication: September, 2025

Presented at: 60th International Universities Power Engineering Conference (UPEC 2025)

Department: Electrical Engineering

This paper highlights the urgent need to integrate sustainability into electrical engineering education in response to climate change, resource depletion, and the demand for clean energy solutions. It identifies significant gaps in current curricula, where sustainability is often overlooked or treated as peripheral, resulting in graduates lacking awareness of environmental impacts and practical skills for sustainable design. To address these challenges, the paper proposes a comprehensive integration framework that emphasizes course redesign, interdisciplinary collaboration, hands-on learning, capstone projects, and industry engagement. Embedding sustainability into core subjects not only enhances students' technical expertise but also fosters innovation, career readiness, and leadership aligned with the United Nations Sustainable Development Goals (SDGs 7, 9, 12, and 13). Ultimately, the paper argues that rethinking engineering education is essential to prepare future engineers to develop environmentally responsible technologies and contribute to a more resilient and sustainable future.



Publications Related to RME and/or Sustainability

A Review on Bio-inspired Corrosion Resistant Superhydrophobic Coating on Copper Substrate: Recent Advances, Mechanisms, Constraints, and Future Prospects

| DOI

Authors: Himanshu Prasad Mamgain a | Pravat Ranjan Pati b | Krishna Kanta Samanta c

Date of publication: June, 2025

Department: Industrial engineering

Corrosion poses significant challenges, leading to material deterioration and adverse effects on characteristics like conductivity and malleability, resulting in infrastructure failures and economic losses. Traditional corrosion prevention methods have limitations, such as high costs and limited

effectiveness. Nanostructured superhydrophobic coatings (SH) have emerged as promising solutions due to their effectiveness in preventing corrosion and diverse industrial applications. These coatings leverage low surface energy and high surface roughness to create micro air pockets, reducing contact with corrosive media and water droplets, thus enhancing corrosion resistance. This review discusses recent advancements in physical and chemical techniques for producing corrosion-resistant SH coatings on copper substrates and their compatibility with other metals while maintaining stability. Researchers have explored various surface morphologies, textures, and energies to impede corrosion effectively. The paper emphasizes the novelty of these developments, highlighting both limitations and potential future directions for SH coatings.

The Moderating Role of Information Quality in The Relationship Between Operational Performance andSupply Chain Integration: Evidence fromThe Manufacturing Sector

| DOI

Authors: Mohammad Kanan

Date of publication: June, 2025

Department: Industrial Engineering

In this study examined the moderating effect of information quality (InfoQ) in the relationship between supply chain integration (SCI) and operational effectiveness withinthe manufacturing sector.Respondents from selectedmanufacturing companies provided thestudy data, which were then analyzed using structural equation modeling, to ascertain the proposed relationships. Results affirmed a correlation between SCI (both supplier and customer integration) and operational effectiveness, denoting the ability of streamlined supply chains in increasing operational outcomes. This correlation is also influenced by InfoQ, which means thatintegrated supply chainsrequire accurate information.Supply chain management can be understood better through the study findings. Also, the findings could facilitate managers in improving their operational performance through the use of SCI-based initiatives.

Evaluation of Tourist Destinations Carrying Capacity in a Decision-Making Context With Muirhead Means Aggregation Operator in q-Rung Orthopair Fuzzy Hypersoft Environment

| DOI

Authors: MUHAMMAD NAVEED JAFAR 1 , FAIZ ULLAH 2 , SAHAR AHMED IDRIS3 , WAEL FAWZY MOHAMED MOBARAK 4,5, ZAFFAR AHMED SHAIK,1Department of Mathematics, University of Management and Technology, Lahore 54770, Pakistan 2Department of Mathematics, University of Engineering and Technology, Lahore 54890, Pakistan 3Faculty of Engineering, Department of Industrial Engineering, King Khalid University, Abha 61421, Saudi Arabia 4College of Engineering, University of Business and Technology, Jeddah 21448, Saudi Arabia 5Engineering Mathematics Department, Alexandria University, Alexandria 21544, Egypt 6Department of Computer Science and Information Technology, Benazir Bhutto Shaheed University Lyari, Karachi 75660, Pakistan 7School of Engineering, École Polytechnique Fédérale de Lausanne, 1015 Lausanne, Switzerland 8Trinity Health, Trinity Information Services, Livonia, MI 20555, USA 9Department of Environmental Sciences and Policy, Lahore School of Economics, Lahore 53200, Pakistan Corresponding authors: Wael Fawzy Mohamed Mobarak (w.fawzy@ubt.edu.sa) and Zaffar Ahmed Shaikh (zashaikh@bbsul.edu.pk)H 6,7, (Member, IEEE), DURGA CHAVALI 8 , (Senior Member, IEEE), AND KAINAT MUNIBA

Date of publication: June, 2025

Department: Civill Engineering

Navigating the intricate and ever-expanding globe poses greater challenges in decision-making due to the uncertain nature of the environment. This study aims to cope with the imprecisions and such challenges in decision-making due to the uncertain nature of the environment and extend the formal representation of the human mind in terms of the q-rung Orthopair fuzzy hypersoft set (q-ROFHSS). It provides a multi-parameterized mathematical framework that effectively expresses problems with multidimensional information within a dataset. Thus, the proposed theory accumulates the parametric structure of q-rung Orthopair fuzzy sets (q-ROFS) and hypersoft sets (HSS) under the Muirhead mean (MM) aggregation operator (AO), as the AO can deal with ambiguous and uncertain information. By establishing basic settheoretic operations, we have presented some fundamental properties and basic operations using the q-rung Orthopair fuzzy hypersoft values (q-ROFHSV). To demonstrate its flexibility, the relationship between the proposed approach and existing state-of-the-art techniques has been defined. Further, the feasibility of the proposed approach has been showcased through a case study of tourism carrying capacity, as it is a widespread activity that allows people to escape from their daily routines and explore new destinations for various reasons, including leisure, pleasure, or business. By implementing the proposed approach, an effective plan can be developed for social and economic development while avoiding detrimental effects such as overcrowding or environmental damage caused by tourism.

PROJECT MANAGEMENT PRACTICES FOR DEVELOPING ECONOMIES AND CONSTRUCTION PROJECTS SUCCESS – AN EGYPTIAN COMPARATIVE STUDY

DOI

Authors: Aboelmagd, Yasser M. R.1,1. Civil Engineering Department, College of Engineering, University of Business & Technology (UBT), Jeddah, Saudi Arabia.

Date of publication: June, 2025

Department: Civil Engineering

This work aims to improve comprehension of the practices system by examining the interrelationships among them with the DEMATEL technique. A number of project management best practices have been identified and corroborated by prior studies and semi-structured interviews with project specialists. Relationships among these practices have been categorised as “cause” and “effect” factors. Data on 537 engineers, project managers, and administrators was collected, encoded, and assessed. Nonparametric tests and descriptive have been utilised to characterise the sample, evaluate hypotheses, and address the enquiries. All responders agreed and endorsed the necessity of the techniques specified in this project. Despite this total being consistent, significant disparities in the perceived relevance of these best practices emerge between construction professionals and the project team. A statistically significant correlation existed between the cause and effect of best practices, alongside notable differences in participants' perceptions of best practices and success indicators based on gender, age, education level, profession, current work experience, and overall experience. Ultimately, recommendations were provided to the construction sector to enhance their project management methods.

MODEL COMPRESSION FOR REAL-TIME OBJECT DETECTION USING RIGOROUS GRADATION PRUNING

DOI

Authors: Defu Yang1,4 1002266257@ucsiuniversity.edu.my • Mahmud Iwan Solihin1 mahmudis@ucsiuniversity.edu.my • Yawen Zhao1 • Bingyu Cai1,1 Faculty of Engineering, Technology and Built Environment, UCSI University, Kuala Lumpur, Malaysia 2 School of Advanced Manufacturing, Shantou Polytechnic, Shantou, China 3 Department of Mechanical Engineering, University of Business & Technology, Jeddah, Saudi Arabia 4 Lead contact2 • Chaoran Chen1,2 • Andika Aji Wijaya3 andika@ubt.edu.sa • Chun Kit Ang1 • Wei Hong Lim1,

Date of publication: June, 2025

Department: Mechanical Engineering

Achieving lightweight real-time object detection necessitates balancing model compression with detection accuracy, a difficulty exacerbated by low redundancy and uneven contributions from convolutional layers. As an alternative to traditional methods, we propose Rigorous Gradation Pruning (RGP), which uses a desensitized first-order Taylor approximation to assess filter importance, enabling precise pruning of redundant kernels. This approach includes the iterative reassessment of layer significance to protect essential layers, ensuring effective detection performance. We applied RGP to YOLOv8 detectors and tested it on GTSDB, Seaships, and COCO datasets. On GTSDB, RGP achieved 80% compression of YOLOv8n with only a 0.11% drop in mAP0.5, while increasing frames per second (FPS) by 43.84%. For YOLOv8x, RGP achieved 90% compression, a 1.26% mAP0.5:0.95 increase, and a 112.66% FPS boost. Significant compression was also achieved on Seaships and COCO datasets, demonstrating RGP's robustness across diverse object detection tasks and its potential for advancing efficient, high-speed detection models

Comparative Analysis of Hall Current Impact on MHD Laminar Surface Tension Gradient 3D Flow of Propylene Glycol Based Tetra Hybrid Nanofluid with Generalized Fick's and Fourier's Perspective

| DOI

Authors: Munawar Abbas a , Shirin Shomurotova b , Qasem Al-Mdallal c , Ali Akgül d e f g , Zuhair Jastaneyah h , Hakim AL Garalleh h,a Department of Mathematics, The Islamia University of Bahawalpur, Bahawalpur, 63100, Pakistan b Department of Chemistry Teaching Methods, Tashkent State Pedagogical University named after Nizami, Bunyodkor street 27, Tashkent, Uzbekistan c Department of Mathematical Sciences, P.O. Box 17551, UAE University, Al-Ain, United Arab Emirates d Department of Electronics and Communication Engineering, Saveetha School of Engineering, SIMATS, Chennai, Tamilnadu, India e Siirt University, Art and Science Faculty, Department of Mathematics, 56100 Siirt, Turkey f Department of Computer Engineering, Biruni University, 34010 Topkapı, Istanbul, Turkey g Near East University, Mathematics Research Center, Department of Mathematics, Near East Boulevard, PC: 99138 /Mersin 10, Nicosia Turkey h Department of Mathematical Science, College of Engineering, University of Business and Technology, Jeddah 21361, Saudi Arabia

Date of publication: June, 2025

Department: General Subjects

Examine the significance of the Cattaneo-Christov flux model on the Marangoni convection 3D flow of tetra hybrid nanofluid combined with Hall current in the present study. When exposed to a fluctuating magnetic flux, it demonstrates electrical conductivity over a stretchy sheet. Using the Cattaneo-Christov double diffusion (CCDD) model, the problem is simulated. In this work, the CCDD model is used to analyze the mass and heat transmission tetra hybrid nanofluid. Basic Fourier's and Fick's laws are generalized by their application. A tetra hybrid nanofluid consisting of Molybdenum disulfide (Mos_2), copper (Cu), Silicon dioxide (SiO_2) and cobalt ferrite ($CoFe_2o_4$), propylene glycol ($C_3H_8O_2$) as the base fluid is used. This model is essential for precisely predicting the behaviors of heat transfer in nanofluid flows since it takes thermal relaxation time into consideration. Its uses include optimizing heat exchanger performance, enhancing cooling systems in electronics, and better thermal management in microfluidic devices. The basic set of equations is resolved employing the numerical technique (bvp4c). The nanofluid, hybrid, trihybrid, and tetra hybrid nanofluid graphs are all compared. The stretching ratio parameter indicates rising trends in the flow distributions, although the opposite performance is observed for thermal and concentration distributions. Rate of heat and mass transmission improve of tetra hybrid, trihybrid, hybrid nanofluids as increase the values of Marangoni convection.

Integrate mathematical modeling for heat dynamics in two-phase casson fluid flow through renal tubes with variable wall properties

DOI

Authors: P. Deepalakshmi a , Adil Darvesh b , Hakim AL Garalleh c , Manuel Sánchez-Chero d , G. Shankar a , E.P. Siva a a Department of Mathematics, College of Engineering and Technology, SRM Institute of Science and Technology, Kattankulathur 603203, Tamil Nadu, India b Department of Mathematics and Statistics, Hazara University, Mansehra 21300, Pakistan c Department of Mathematical Science, College of Engineering, University of Business and Technology, Jeddah 21361, Saudi Arabia d Grupo de Investigación, Desarrollo e Innovación en Industrias Alimentarias, Universidad Nacional de Frontera, Sullana, Perú

Date of publication: June, 2025

Department: Mathematical science

Urine consists of cells and many chemicals, and its complex rheological characteristics can be accurately explained using non-Newtonian fluid models. A theoretical study is conducted on the peristaltic pumping of a Casson fluid through inclined tapering wavy walls of the ureter containing debris. The Casson fluid serves as the base liquid in which homogeneous and spherical solid particles are suspended. In order to simulate the motion of both fluids and particles, non-linear partial differential equations were employed. The flow through the ureter is exposed to evenly distributed magnetic field in the transverse direction. To calculate the flow-anchored equations, we assume a low Reynolds number and deliberate over long wavelengths. The resulting exact solutions were obtained using the Matlab software to determine the fluid temperature, contour pattern, velocity of the deposited particles, and fluid. We investigate the effects of wavy tapered walls with variable wall characteristics, thermal radiation and variable heat source on the flow of a non-Newtonian Casson fluid in an inclined channel. The particle phase models the behavior of stiff calculi suspensions due to lack of filtration process. The simulations illustrate that electromagnetic radiation can effectively manipulate the pumping properties in urology. *The originality of this study lies in the concurrent examination of a generalised two-phase model, partial wall slip, non-Newtonian fluid properties, cross diffusion, magnetic body force, elastic wall behaviour in the presence of debris, and curvature effects in peristaltic urological transport, a comprehensive approach not previously explored.* This text highlights several novel aspects of the dynamics of the ureter in two-phase conditions, which are relevant to the usage of magnetic therapy and thermal radiation techniques. The study also considers the impact of radiation and the visualisation of wall tension parameter using contour plots. More thermal energy is contributed due to radiation causing a reduction in the velocity of the fluid. Fluctuations in the thermal radiation parameter (*Rn*) suggest the presence of localized inflammation or infection, specifically called urinary tract infections (UTIs) or ureteral inflammation (ureteritis). Enhancement in particle volume fraction tends to a reduction in the rate of peristaltic pumping. An elevation in the Hall current parameter leads to a reduction in the growth of the bolus in the channel, as well as a drop in the velocity of the particle phase. The heat transfer rate intensified as the values of the Casson parameter of the non-Newtonian fluid and magnetic parameter were raised. Both the wall tension and wall mass parameters on the profiles exhibit behaviours that are qualitatively comparable to one another.

Institutional Quality and Sustainable Firm Growth: Evidence From North African Countries

| DOI

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Department: Accounting

This study investigates the relationship between institutional quality (IQ) and sustainable firm growth (SFG) in North Africancountries, focusing on Egypt, Morocco, and Tunisia. Utilizing panel data from 155 non-financial firms over the period 2007–2020, we employ a system generalized method of moments (GMM) approach to analyze this relationship. Our findings reveal asignificant U-shaped relationship between IQ and SFG, indicating that both very low and very high levels of IQ are associatedwith limited firm growth, while an optimal level of IQ promotes substantial growth. This suggests that firms in low-IQ envi-ronments struggle due to weak regulatory frameworks and corruption, whereas those in high-IQ environments benefit frombetter governance and transparency, leading to enhanced growth. The study makes several contributions by providing empiricalevidence from an underexplored region, highlighting the complex dynamics between institutional quality and firm growth, andoffering robust methodological insights. Policy implications underscore the need for balanced regulation and long-term invest-ment in institutional quality, education, and infrastructure.

The Impact of Board of Directors' Characteristics on the Financial Performance of the Banking Sector in Gulf Cooperation Council (GCC) Countries: The Moderating Role of Bank Size

DOI

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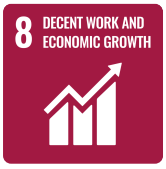
Department: Finance

This study investigates the impact of corporate governance characteristics on bank financial performance in Gulf Cooperation Council countries. The board characteristics include board size, board independence, board gender diversity, and CEO duality (CEO is also Board Chair), with bank size as the moderating variable. Sixty-six commercial banks from six Gulf Cooperation Council countries—Saudi Arabia, United Arab Emirates, Kuwait, Bahrain, Oman, and Qatar—are examined from 2019 to 2023 using two-stage least squares and generalized method of moments econometric methods. Board size, board independence, and board gender diversity significantly increase return on assets and return on equity. The impact of CEO duality is mixed. The empirical findings show that CEO duality increases return on equity, with a non-significant impact on return on assets. Finally, results show that bank size moderates the impacts of board size, board independence, and gender diversity in boards on the financial performance of banks. Large banks significantly increase return on assets and return on equity due to the board characteristics examined, to a greater extent than small banks. Bank leaders should expand board membership, and add independent directors and women, to improve financial performance.



Hybrid structure design of expanded steel mesh to enhance the tensile performance of fiber-reinforced composites

DOI

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Date of publication: June, 2025

Department: General subjects

Metal hybrid structures with fiber-reinforced composites optimize strength, weight, toughness, and durability while minimizing cracks and retaining structural integrity. The present investigation evaluates the tensile performance of hybrid composites manufactured from expanded steel wire meshes and fiber-reinforced epoxy versus pure glass fiber (GE). Hybrid specimens were fabricated with steel mesh of varying pattern sizes inserted at two different positions within the composites and exposed to two loading layouts. The results indicated that replacing GE layers with steel mesh decreased specimen density by 6.25% while increasing ductility and energy absorption. Medium-size mesh provided the most effective performance, enhancing tensile strength, peak load, energy absorption, and stiffness by an average of 18.9% over other sizes. The outer layer configuration was superior to the inner layer, improving peak strength, failure strain, stiffness, and absorbed energy by up to 25.6%. Moreover, vertical loading boosted overall performance by an average of 28.5% compared with horizontal loading. The SO2 configuration was selected via Grey Relational Analysis to be the most effective arrangement.

Effect of carbon nanotubes and zinc oxide on electrical and mechanical properties of polyvinyl alcohol matrix composite by electrospinning method

| DOI

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Date of publication: June, 2025

Department: General Subjects

In this study, polymer composite nanofibers and thin membranes were synthesized using Carbon Nanotubes (CNTs) and Zinc Oxide (ZnO) as fillers in a Polyvinyl Alcohol (PVA) matrix, aiming to evaluate their electrical and mechanical properties. The composite nanofibers and thin membranes were prepared by incorporating different weight ratios of CNTs and ZnO into the PVA matrix using

electrospinning and solution casting techniques, respectively. Solutions were prepared by mixing specific weight ratios of PVA, ZnO, and CNTs, followed by magnetic stirring and ultrasonication for homogenization. Electrospinning was performed at 20 kV with a syringe-to-collector distance of 14.5 cm at flow rate of 2.4 ml/hr. The composites were characterized using FTIR spectroscopy and Scanning Electron Microscopy (SEM). The PVA/5%ZnO/0.5%CNT composite exhibited the highest dielectric constant of 10.3 at high frequencies, while PVA/5%CNT showed the highest capacitance of 31.1 *pF* at 2 MHz. The maximum AC conductivity of $2.72 \times 10^{-7} S/m$ was also observed for the PVA/5%ZnO/0.5%CNT composite. Mechanical testing revealed significant improvements in Young's modulus, stress yield, and load yield, with PVA/5%CNT achieving a Young's modulus of 387.12 *MPa* and a stress yield of 6.92 *MPa*. The addition of ZnO and CNT fillers resulted in enhanced electrical and mechanical properties, making these composites suitable for applications in microelectronic devices and packaging materials.

Thermal characteristics of hybrid Nanofluid (Cu-Al2O3) flow through Darcy porous medium with chemical effects via numerical successive over relaxation technique

| DOI

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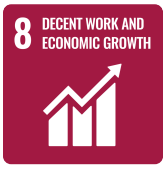
Date of publication: June, 2025

Department: General Subjects

The flow of fluids through porous media is commonly described using the Darcy model, therefore investigating hybrid nanofluids in this setting is rather new. The present work offers insightful information on how the hybrid nanofluids behave and function in porous medium. The study's conclusions may have an impact on a lot of different engineering applications like filtration systems, chemical reactors, and environmental engineering. The study concentrates on a hybrid nanofluid which consists of *Cu* and Al_2O_3 nanoparticles. The metallic nanoparticles such as copper have high thermal conductivity and non-metallic nanoparticles such as aluminum oxide are chemically stable and has high thermal resistance. This is the reason that the combination Cu-Al_2O_3 is believed to give better heat transfer composite than using individual nanofluids. By employing proper similarity transformation, the governing PDEs are turned into ODEs. To discretize these ODEs, the central finite difference method is used first. Then the successive over relaxation technique is utilized to numerically solve the nonlinear equations. The findings are summarized in a graphical and tabular format. The impacts of several controlling parameters such as porosity, suction, Schmidt number and

volume fraction on flow pattern, thermal properties, and concentration are investigated and discussed. The streamwise and normal velocity profiles fall and those of concentration and temperature rise with increase in the values of the porosity parameter.



A Comparative Study of Differential Quadrature Methods for METE Nanobeam Vibrations

DOI

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Date of publication: June, 2025

Department: General Subjects

This study investigates the use of three different quadrature schemes, as well as an iterative quadrature methodology, to analyze vibrations in magneto-electro-thermoelastic nanobeams. Individual MATLAB programs for each method are developed with the goal of minimizing errors in comparison to accurate findings, as well as determining the execution time for each strategy. This study shows that the Discrete Singular-Convolution Differential Quadrature Method with a Regularized Shannon Kernel (DSCDQM-RSK) and specified parameters produces the best accurate and efficient results for this particular situation. A subsequent parametric study is carried out to determine the effect of various factors on the vibrated nanobeam, including boundary conditions, material types, linear and nonlinear elastic foundation properties, nonlocal parameters, length-to-thickness ratios, external electric and magnetic potentials, axial forces, and temperature variations. Important discoveries include insights into the relationship between fundamental frequency, linear elastic foundation features, axial loads, external magnetic fields, temperature fluctuations, and material types. According to this study, these findings could be critical in the development of sophisticated nanostructures made from magneto-electro-thermo-elastic materials for use in a variety of electromechanical applications. This would entail utilizing nanobeams' unique properties in applications such as sensors, resonators, and transducers for nanoelectronics and biology.

Innovative Leadership and Organizational Excellence: A Study on Jordanian Higher Education Institutions

| DOI

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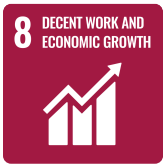
Date of publication: June, 2025

Presented at: general subjects

Department: General Subjects

The study aims to identify the degree of innovative leadership practice in relation to the level of organizational excellence in Jordanian higher education institutions. To achieve the study's objective, a random sample, which included (400) academic and administrative workers in Jordanian higher education institutions, was selected to participate in the study. Results of the study showed that the degree of both innovative leadership practice and level of organizational excellence was moderate. The results also indicated that there was a positive statistically significant relationship between the degree of innovative leadership practice and the level of organizational excellence. In light of these results, the study recommends working towards abating obstacles that undermine creative and innovative



Influence of Heat on Fractionalized Nanofluid with Magnetic Field

| DOI

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Date of publication: July, 2025

Department: General Subjects

Numerous researchers have been drawn to the rheology of non-Newtonian fluids because of their diverse uses in the engineering and manufacturing fields, such as lubrication, plastic processing, and mining. Additionally, the characteristics of magnetohydrodynamics non-Newtonian fluids permit its widespread application in computer hard drives, loudspeakers, magnetic resonance imaging, the administration of magnetic medicines, and magnetic hyperthermia. The novelty of present study is the use of fourier's and fick's laws. The current work is focused on the analysis of heat and mass transfer in a magnetohydrodynamics Maxwell nanofluid flows across an inclined vertical plate because of these possible uses. The values of angle of inclination is chosen in the range 0 to . From Table 1, the values of nanoparticles lies in the range of 0.012–0.18. Using suitable non-dimensional variables, ordinary differential equations are created from the modeling equations, and the Laplace transform method is used to solve these equations. Semi-analytical solutions for temperature, concentration, Bio-Convection, and velocity are found after employing the Laplace transform approach to address the issue. The study highlights several key outcomes likes velocity of fluid is increased with increasing values of Gr but decreased with increasing values of Pr, M, and maxwell parameter. The effect of increasing values of parameters R, , and are seen to suppress the concentration profile. The bioconvection concentration profile increases with but reduced with increasing values of L2. Furthermore, the comparison between ordinary and fractionalized maxwell fluid has been drawn. The application of the unsteady flow of nanofluid over a plate with the CPC operator has the potential to impact a wide range of solar energy-related technologies and innovations, leading to increased efficiency, sustainability, and the advancement of renewable energy solutions.

Monitoring the Transmission of Data From Wearable Sensors Using Probabilistic Transfer Learning

DOI

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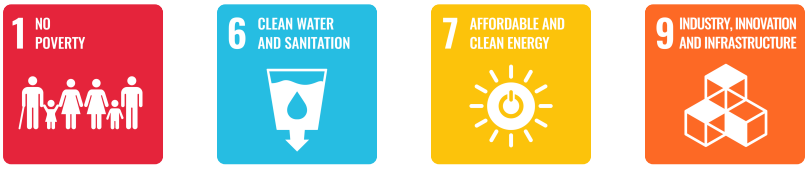
Date of publication: July, 2025

Department: Electrical Engineering

New applications like activity tracking and healthcare monitoring depend on secure and timely data transfer using wearable sensors. This work aims to reduce data loss and latency when transmitting wearable sensor information to analysis terminals by introducing an innovative probabilistic transfer learning approach. Using dynamic transmission slot allocation based on risk thresholds and time sensitivity, the suggested method intelligently arranges and prioritizes the transfer of aggregate sensor data across various sources. High-risk data is given preference when allocating slots in a two-step algorithm that divides the data into emergency and normal classifications to guarantee timely delivery without undue delays. Over time, for better activity identification, the transfer model of learning steadily learns and improves the slot assignment accuracy based on feedback. Comprehensive analysis of various queuing scenarios and transmission disruptions shows notable improvements over existing approaches, with waiting times, data loss, and transmission delays reduced by up to 10.49%, 2.42%, and 13.86%, respectively. Most importantly, 3.28% more accuracy is achieved in identifying distinct activities from the supplied wearable sensor data. This can be achieved by the dependable data supply by the probabilistic modelling approach. With its comprehensive

architecture for efficiently managing limited communication resources, the suggested approach can provide real-time health surveillance, smart environment services, and other digital-physical systems requiring trustworthy data streaming. More interaction with statistical engines, improvements to security and privacy, and scalability validation on larger distributed platforms are possible areas for future work.



Enhancing the driving experience of smart city users based on content delivery framework for intelligent transportation systems

DOI

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Date of publication: July, 2025

Department: Electrical Engineering

Integration of several communication technologies that facilitate user access contributes to the rapid development of the smart city notion. Intelligent transportation systems (ITS) are introduced as part of smart city development to provide drivers with enhanced communication and information-sharing capabilities. The article introduces a novel ITS content delivery framework (CDF) that addresses communication outage issues. CDF-ITS uses End-to-end decision-making system modelling to examine factors such as communication, content distribution, and vehicle features. A suitable communication slot for vehicular users is determined by processing these characteristics based on outage time and variables. By allocating time-aware communication slots according to the classification of the propagation factor, outage problems may be reduced. End-to-end decision-making is used for classification and vehicle attribute balance, allowing immediate responses to user requests. The experimental outcomes show that the latency of 0.297 s, outage time of 0.0837, distributed messages of 276, and computing complexity of 11.87 are used to assess the proposed framework's efficiency across vehicle density and velocities.

Advancing building management with nano-enhanced carbon materials: a machine learning-driven business and economic analysis

DOI

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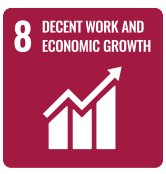
Date of publication: July, 2025

Department: General Subjects

Carbon aerogels including graphite and graphene have unique properties such as lightweight, strong, and insulative to roofing applications. Carbon aerogels offer innovative solutions in building management by enhancing thermal and acoustic insulation while reducing structural weight, aligning with the focus on economic and business analysis driven by machine learning. Traditional building materials often fail to meet contemporary energy efficiency and sustainability demands, underscoring the necessity for more advanced solutions. This project is dedicated to integrating carbon aerogels into roofing systems and employs Deep Neural Networks (DNNs) to optimize their performance and integration. The novelty of this study lies in its application of carbon aerogel technology—a cutting-edge, lightweight, and highly insulative material—specifically within roofing to analyze the practical evaluation of carbon aerogels' thermal properties and economic viability in the construction industry. This study aims to rigorously assess carbon aerogels' performance and financial impact on roofing applications. By conducting the thermal guard test and economic lifecycle evaluation, the study seeks to validate carbon aerogels' enhanced energy efficiency and cost-effectiveness compared to traditional roofing materials. The study demonstrates that carbon aerogels offer superior thermal insulation in roofing applications, with a thermal conductivity of 0.02 W/m·K, significantly outperforming traditional materials. Economically, the high initial cost of carbon aerogels is effectively offset by substantial energy savings, estimated at $300 annually per square meter, resulting in a payback period of approximately 1.05 years. These findings are supported by rigorous testing and optimization through DNN, highlighting the material's potential to enhance energy efficiency and sustainability in building practices.



Exploring the Factors Influencing Women Entrepreneurship in Saudi Arabia: A Strategic Plan for Sustainable Entrepreneurial Growth

DOI

Authors: Mohammad Saleh Miralam 1,*, Sayeeduzzafar Qazi 2, Inass Salamah Ali 3 and Mohd Yasir Arafat 4,5 1 College of Business, University of Jeddah, Jeddah 23218, Saudi Arabia 2 College of Business Administration, University of Business and Technology, Jeddah 23435, Saudi Arabia; sayeed@ubt.edu.sa 3 School of Business and Law, Dar Al Hekma University, Jeddah 22246, Saudi Arabia; iali@dah.edu.sa 4 Division of Research and Development, Lovely Professional University, Phagwara 144411, India; yassarafatt@gmail.com 5 Department of Commerce, Aligarh Muslim University, Aligarh 202001, India * Correspondence: mmiralam@uj.edu.sa Abstract: Saudi Vision 2030, a strategic framework aimed at diversifying

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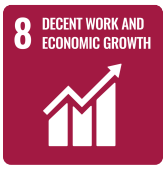
Department: Human Resource Management

Saudi Vision 2030, a strategic framework aimed at diversifying the economy and enhancing societal inclusivity, aligns with the UN's Sustainable Development Goals (SDGs) by promoting gender equality and sustainable economic growth. Sustainability is central to fostering women's entrepreneurship, as it drives social equity, economic diversification, and innovation, elements which are crucial to sustainable development. While the existing literature has primarily focused on women's entrepreneurship in the Western world, limited attention has been given to its development in the Global South, particularly in Saudi Arabia. As a nation undergoing transformative social, cultural, and economic shifts, women entrepreneurs play a critical role in aligning entrepreneurial efforts with global sustainability goals. This research investigates the factors influencing Saudi women to become entrepreneurs, specifically examining the factors that inspire or hinder them from creating their own ventures. Drawing upon cognitive and social capital theories, which have proven their soundness in the existing literature, this research utilizes a dataset of 1715 women entrepreneurs analyzed through binomial logistic regression. The findings indicate that social desirability, relational capital, experience as angel investors, age, income, and education significantly increase the likelihood of women's entrepreneurship. By contextualizing women's entrepreneurship within Saudi Arabia's evolving societal and economic landscape, this research highlights their potential as drivers of inclusive growth and sustainable economic empowerment. Furthermore, the research outlines strategies to enhance women's entrepreneurial participation, contributing both to the entrepreneurship literature and the realization of Saudi Vision 2030.



Entropy and back-propagation analysis of hybrid nanofluid flow over a radially stretching disk: Response optimization and sensitivity analysis

DOI

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Date of publication: July, 2025

Department: Electrical Engineering

We are investigating the heat transfer and other flow profiles for a hybrid nanofluid flow over a stationary stretching disk in Bodewadt flow. Sensitivity analysis was performed for the Nusselt number as a response parameter along with response optimization and back-propagation using neural networks. The present study helps in predicting the behaviour of hybrid nanofluids for such flows and optimizing the design of systems for improved thermal performances finding applications in cooling devices, centrifuges and turbomachineries. Levenberg-Marquardt algorithm was implemented on Nusselt number values for stretching parameter nanoparticle volume fraction of primary nanoparticle and secondary nanoparticle Spectral quasilinearisation method (SQLM) was used for solving the dimensionless ordinary differential equations and the numerical data for Nusselt number was used in response surface methodology (RSM) and artificial neural network back-propagation algorithm (ANN-BPA) for evaluating sensitivity analysis and interpolating data respectively. The radial velocity increased with increasing values and nanoparticle volume fraction values. The axial velocity reduced by 39.56 % when increased from 3.0 to 5.0 while it decreased by 6.57 % for an increase of to The pressure term decreased by 23.63 % for increasing to The mean square error for Nusselt number prediction modelling was 6.6016E-11 attained at 1000 epochs with gradient value of 1.2035E-07. Also, Nusselt number was found to be most sensitive to stretching parameter. The optimal response was obtained with 100 % desirability with maximum Nusselt number response recorded as 6.10878 for .

Conferences and Publication

| DOI

Authors: Anne A. Soliman | Amr Salem | Aya Ezzat | Mostafa Khaled Ahmed | Rana Elshafei | Samah El Khateeb | Eman Farouk

Date of publication: June, 2025

Presented at: National or international discipline-specific conference

Department: Architectural Engineering

Smart Cities in Egypt: Advancing Digital Transformation and Urban Sustainability

Abstract

Smart cities are transforming urban development by utilizing AI, IoT, and big data in resolving urbanization challenges, enhancing sustainability, and improving quality of life. Egypt, under Vision 2030, is initiating smart city projects to digitalize infrastructure, propel digital transformation, and attain inclusive, resilient cities. This study employs a qualitative mixed-methods approach, integrating policy analysis, case studies, and empirical surveys to examine Egypt's smart cities through the lenses of governance, education, healthcare, and mobility. A two-stage approach is employed to examine both macro-level regulatory regimes and micro-level smart city implementations and end-user experiences. The study examines progress through Digital Egypt and leading projects like the New Administrative Capital and New Alamein City. Despite progress, challenges persist including regulatory gaps together with scalability problems and digital accessibility barriers as well as socio-economic inequalities. The study establishes the need for stronger governance and private sector participation together with affordable and digital literacy-focused policies to enable equitable smart city development. The final recommendations emphasize regulatory clarity and stakeholder collaboration to overcome socio-economic barriers as a pathway to sustainable and inclusive urban transformation in Egypt.

Keywords: Urban innovation, smart infrastructure, technology-driven urbanism, sustainable urban transformation.

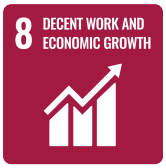
Corporate social responsibility and firm financial performance: the role of intellectual capital

Authors: Muhammad Farooq and Hassan Mujtaba Nawaz Saleem | Qadri Al-Jabri | Asif Nazir

Date of publication: May, 2025

Department: Accounting

Purpose – The present study aims to investigate the impact of corporate social responsibility on firm financial
performance and examine the mediating role of intellectual capital in this relationship.
Design/methodology/approach – The study's sample comprises 125 nonfinancial Pakistan Stock Exchange
(PSX)-listed firms from 2010 to 2021. The firm's engagement in corporate social responsibility activities is
measured using a multidimensional financial approach; firm financial performance is measured using two
proxies, ROA and ROE and the firm's intellectual capital is calculated using the MVAIC model. The generalized
method of moments estimator is used to meet the study's objectives. Several further tests are conducted to ensure
the study's robustness.
Findings – Following the procedure of Baron and Kenny (1986) for median analysis, we establish that intellectual capital is significantly positively linked with firm financial performance. Second, corporate social
responsibility is positively connected with intellectual capital. Third, corporate social responsibility has a
significant positive effect on firm financial performance. Finally, it was found that there is partial mediation
between corporate social responsibility and firm financial performance in the presence of intellectual capital in
the model.
Practical implications – The study findings will benefit regulatory authorities, investors, financial analysts and
other stakeholders by helping them better understand CSR practices in Pakistani organizations and the
significance of CSR in creating firms' intellectual capital and improving firm financial performance.
Originality/value – The present study investigates the connection between corporate social responsibility and
firm financial performance. Furthermore, we expanded the research by examining the mediating function of
intellectual capital in this relationship, particularly in an emerging market.
Keywords Corporate social responsibility, Firm financial performance, Intellectual capital, Emerging market
Paper type Research paper



Research Barriers

In 2024, University of Business and Technology identified the following barrier to conducting research related to sustainability and/or responsibility:

- Time constraints

Partner

We engage people from business, government, civil society, and academia to advance responsible and accountable management education and practice.

How We Define Partner

We define Partner as a strategic and collaborative relationship with stakeholders from business, government, civil society, and academia, grounded in trust, accountability, and shared values. At our institution, partners are not only contributors but also co-creators in shaping responsible management education and practice. Through these partnerships, we align diverse expertise and perspectives to address societal challenges, foster innovation, and create meaningful impact for communities and future generations.

Institutional Partnerships

- AACSB (Association to Advance Collegiate Schools of Business)
- AMBA (Association of MBAs)
- EFMD (European Foundation for Management Development)
- Times Higher Education (THE)

Student Organization Partnerships

- PRME Global Students
- MISK FOUNDATION

Partner Voices

The following statement from our partners demonstrates ways in which our collaborations at University of Business and Technology support sustainability and responsible management education.

Student Perspective: Embedding PRME in Everyday Learning at UBT

As a student at the University of Business and Technology (UBT), I've seen firsthand how PRME shapes both classroom learning and extracurricular activities. Faculty actively encourage students to go beyond theory—for example, one of my peers is currently writing a sustainability-focused research paper with faculty support. These experiences show how responsibility and sustainability are becoming part of our academic foundation.

The Sustainability Club, restructured this year under the model R.A.I.S.E. (Research, Awareness, Initiatives, Systems, Everyone), reflects this commitment in practice. The model divides members into teams that mirror real organizational functions:

- **Research Team** develops data-driven projects (e.g., water-from-air solutions, carbon reduction) and produces research reports and articles.

- **Awareness Team** creates campaigns online and on campus, using creative content, posters, and short videos to make sustainability accessible.
- **Initiatives Team** organises hands-on events such as book swaps, recycling drives, and "No Paper Day," turning sustainability into daily practice.
- **Systems Team** manages accountability—recruitment, attendance, digital records, and member recognition—ensuring the club operates effectively.

Workshops also extend the reach of PRME. One session on our Career Day, **"The Future is Green: Sustainable Careers for a Changing Planet,"** helped students connect their career paths to sustainability trends and opportunities. Even simple initiatives, like recycling bins across campus, reinforce the message that sustainability is not abstract but part of everyday behaviour.

Through these experiences, PRME has influenced the way I approach research, manage people, and view my own academic journey. At UBT, responsible management education isn't just discussed—it's lived through student-led initiatives, faculty support, and real engagement with sustainability challenges.

Practice

We adopt responsible and accountable management principles in our own governance and operations.

How We Define Practice

At our institution, we define practice as the application of knowledge, skills, and values in real-world settings to address societal and environmental challenges. Practice involves experiential learning, community engagement, industry collaboration, and student-led initiatives that translate academic insights into meaningful, responsible actions aligned with sustainability and ethical leadership.

Institutional Policies and Practices

- Employee equity, diversity, inclusion
- Maternal and Paternal Policy
- Policy Against Forced labor, Modern Slavery, Human Trafficking, and Child Labor
- Energy Policy
- Health and Safety Policy
- Smoke Free Policy
- Sustainable food policy
- Sustainable Waste management Policy
- Water management Policy

Practice Awards

In 2024, University of Business and Technology received 2 awards for responsible and/or sustainable practices.

University of Business and Technology Wins Third Place in the "Jeddah Qaderoon" Competition for Implementing Universal Accessibility Standard

Granter: Qaderoon Association

Grantee: UBT

Award Description:

UBT has secured a third place in the medium-sized establishments category at the third edition of the "Jeddah Qaderoon" competition. The event, organized by the Qaderoon Association, honors institutions that excel in applying universal accessibility standards to serve people with disabilities.

Makkah Excellence Award

Granter: Makkah Excellence Award

Grantee: University of Business and Technology

Award Description:

The University of Business and Technology (UBT) has been honored with the prestigious (Makkah Excellence Award)in the Environment category, recognizing its groundbreaking research in solar cell technology and its commitment to advancing renewable energy innovation. The Makkah Excellence Award, established under the patronage of the Emir of Makkah Region, celebrates outstanding achievements that contribute to the region's development and align with national goals, particularly in areas such as sustainability, innovation, and community impact. UBT’s pioneering work in developing third-generation solar cells—featuring zinc oxide nanowires and nanowalls, quantum dots, graphene, and natural proteins from jellyfish and coral—has set a new benchmark in clean energy research. These flexible and efficient solar solutions support Saudi Arabia’s Vision 2030 and the global transition toward sustainable energy. This recognition underscores UBT’s leadership in environmental innovation and its dedication to impactful, forward-looking scientific research.

Share

We share our successes and failures with each other to enable our collective learning and best live our common values and purpose.

How We Define Share

In UBT, we define Share as the intentional exchange of experiences, knowledge, and practices, both our successes and our challenges, in order to foster collective learning and growth. This principle reflects our belief that transparency and openness strengthen our community, allowing us to build on achievements while also learning from shortcomings. By sharing insights across colleges, departments, and with external partners, we create a culture of collaboration and mutual support that amplifies our common values and purpose. In this way, sharing becomes not only a means of accountability but also a driver of continuous improvement and institutional resilience.

Engagement Opportunities

University of Business and Technology offers transparent engagement opportunities for members of our institution and community to contribute to our sustainability and responsibility efforts in the following ways:

- Boards and advisory committees
- Annual reports
- Partnerships with local organizations
- Public events and panel discussions
- Community events and consultation forums

Communication Audiences

University of Business and Technology communicates its policies and progress on sustainable development and responsibility with:

- Faculty and staff
- Media and public relations channels
- Accreditation bodies
- Boards and advisory committees

Communication Barriers

University of Business and Technology faces the following barriers in transparent communications:

Ownership issues

SIGNATORY

University of Business and Technology

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