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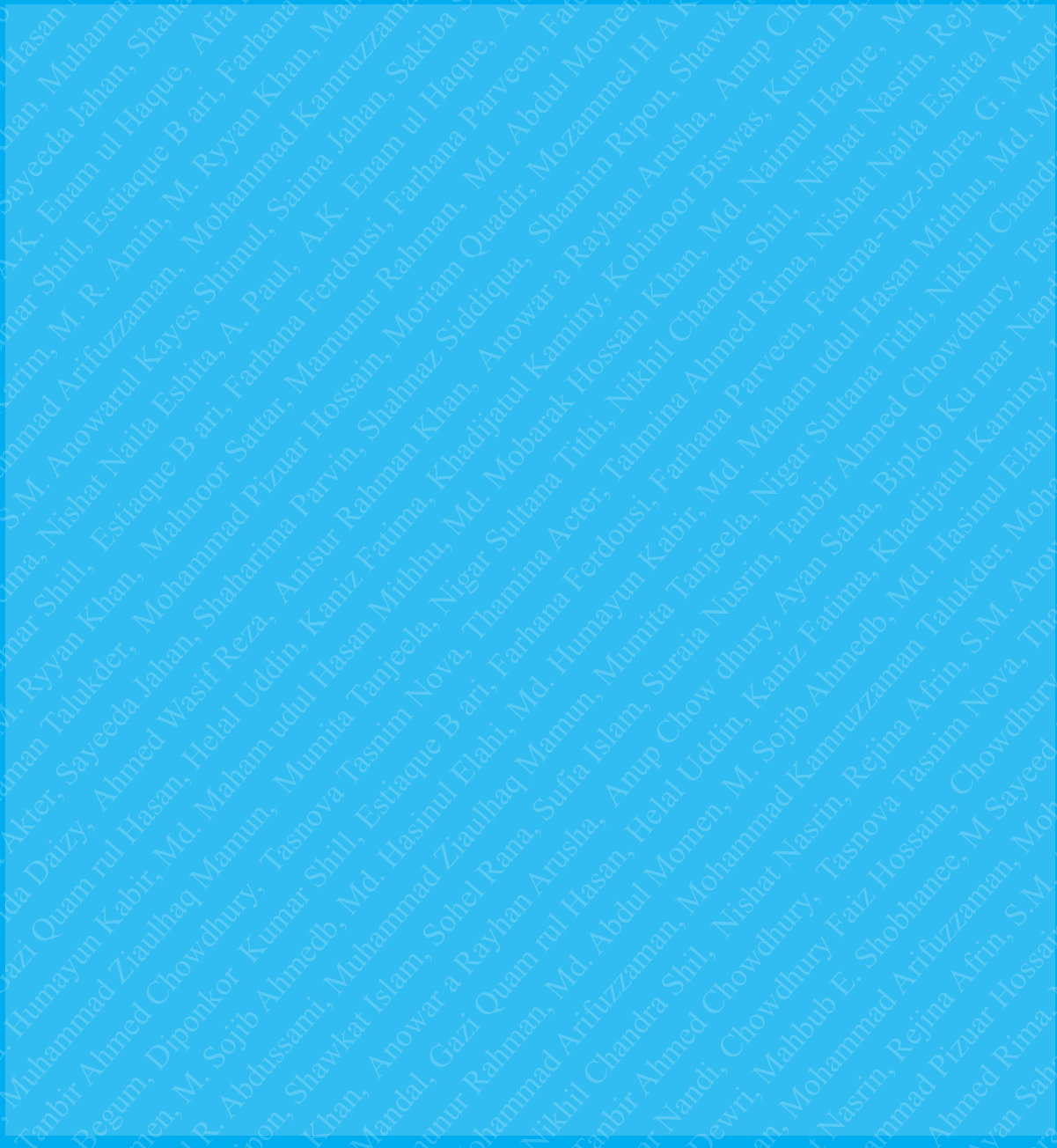

East West University Center for Research and Training
East West University

PREFACE

It is my pleasure to write this introductory note for the sixteenth volume of the Abstracts of Published Papers 2021. The Abstracts of Published Papers is an annual publication of East West University Center for Research and Training (EWUCRT) with an objective to keep an official log of academic publications of the faculty members of East West University. It includes the abstract of published research articles, book chapters, books, and conference papers of our colleagues.

It is indeed a matter of great satisfaction for East West University Center for Research and Training (EWUCRT) to publish the sixteenth volume of the Abstracts of Published Papers, which contains abstracts of the academic publication published in 2021. This publication is a collective effort of the faculty members of the university. Our scholars have enthusiastically and immensely contributed in areas of business, economics, social sciences, engineering, telecommunications, liberal arts and literature, population health, computer science, pharmacy, and technology. This volume contains abstracts of 113 research articles. Among them, 89 articles were published in international and four in national journals, six book chapters were published abroad, as well as 14 papers were published in international conference proceedings. Considering their academic achievements, we sincerely congratulate all the research scholars.

The Center expresses its sincere thanks to Dr. Rafiqul Huda Chaudhury, Chairperson of EWUCRT and Member, Board of Trustees, and all the members of the Research Committee (RC) for their support and encouragement. Furthermore, thanks are also due to all the personnel of EWUCRT involved in this publication.

M. S. Haque

Professor Muhammed Shahriar Haque, PhD
Executive Director
EWUCRT, 2022

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Faculty of Business and Economics

D. A. Tsenov Academy of Economics, Svishtov, Book 3, 2021

Private Sector Management Tools in the Public Sector: Illustrative Evidence of Literature from Australian Public Sector

Anup Chowdhury* and **Nikhil Chandra Shil****

ABSTRACT

Public sector reform processes have brought a wide range of improvements in many areas of public service delivery. This study explores the reforms activities initiated by Australian public sector organizations in the context of new public management ideals. New public management ideals believe that management in the public sector is not different from management in the private sector. Since 1980s the Australian public sector has been dominated by the new public management principles as a response to reform initiatives and eventually different private sector management practices have been introduced in public sector. Literature supports that the Australian public sector organizations have changed their structure and operation in line with the private sector to achieve cost-efficiency, budget accountability and an improved customer focus in service delivery. However, this study doesn't intent to generalize any findings rather highlights a summary based on available literature. Though the context of the present research is Australia, it may be equally useful to every policy maker who are engaged in formulating new policies for respective public sector. Moreover, the findings reported in this study would be useful to the public sector managers in their day to day decision-making.

Keywords: Private Sector Management, Public Sector, New Public Management, Australian Public Sector

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Public Budgeting in Bangladesh: An Earnest Quest for Transparency and Accountability

Nikhil Chandra Shil*, Zahirul Hoque and **Anup Chowdhury****

ABSTRACT

In the recent decade, governments worldwide are increasingly focusing on being community-centric and outcomes-based. Consequently, they are starting to move towards outcomes-based approaches to public financial management systems. An outcomes-based approach allows government service agencies and specific program areas to organize and communicate priorities to achieve what matters and makes a difference rather than just going through the motions. Empirical evidence on how government agencies in emerging economies go about this contemporary approach and issues affecting these practices is limited. This edited collection of chapters is aimed at covering public sector reform and performance management in emerging economies with special reference to outcomes-based approaches in practice in government services. Practices from developed economies contained in the first book on the topic have been published by Routledge in February 2021. The insights offered on the topic are written by renowned scholars who have identified important issues pertinent to those interested in public sector governance, accounting, accountability, and performance management effectiveness in emerging economies. The book will be highly accessible to researchers, academics, and students in the fields of accounting, public administration, development studies, and other non-accounting audiences alike.

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Entrepreneurial Marketing for Growth: A Case of Relevance During Pandemic from the Street Food Business in Dhaka

M Sayeed Alam* and **Kohinoor Biswas****

ABSTRACT

This paper is a single case study of a street food vendor, namely Nababi Muri Vorta who got success and expanded into two branches. But on the face of the ongoing pandemic, the micro-business is currently out of the operation. Street food vendors are mostly micro enterprises and operate in the informal sector. Muri Vorta is a kind of snack item made out of spicy puffed rice served with a wide range of add-ons. The word Nababi is of Bangla origin which mean royal. This brand is jointly run by two owners. Primary data collection tool used by the authors was in-depth interview with the owner. These two owners clearly connect their success with the entrepreneurial marketing. They clearly mentioned the role of entrepreneurial marketing to give a competitive advantage to create value for their target customers, form market and initiate growth for business.

Keywords: Entrepreneurial Marketing, Street Food Vendors, Dhaka

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Rethinking or Remaining the Same: The Dilemma of a Young Foodpreneur

M Sayeed Alam* and **Kohinoor Biswas****

ABSTRACT

On September 18, 2017, Anim, a third-semester university undergraduate student, opened a fast-food shop Burger State in a food cart in Genderia Old Dhaka. This occurred in the informal sector. This was a joint venture by quartet university students in their early twenties. Burger State had a humble beginning with just three products (burgers, sub sandwiches, and cold coffee), operated after their class hours and used no assistance from outside. The main motivation for starting a business was to provide tasty burgers at a low cost to the local community, especially young school, and college students. Anim and his partners were prosperous in their venture, making a profit and recouping their initial investment within one month. They are in the informal sector and operate a food cart, so they are increasingly encountering difficulties in continuing the business as smoothly as it was in the beginning. More food carts began to operate, and other local issues compelled them to consider entering the formal sector. Surprisingly in March 2019, they opened a pizza shop Pizza Club Genderia with a large 66-item menu, rather than their main product, the burger. They were once well-known in the area for their delicious burgers, but their latest move surprised the locals. They chose pizza because they believed it would broaden their customer base, and there was no pizza shop in that area at the time. They also believed that getting into the pizza business would be challenging. Dilemma in the case -The early success of Burger State inspired the establishment of Pizza Club Genderia. Due to Covid 19, the adventure came to a halt right at the commencement of Pizza Club Genderia's new beginning. Burger State, a tiny firm with a limited product line (8 products in three categories), was a success, whereas Pizza Club Genderia was a failure (66 items in 8 categories). Due to Covid 19, business costs have increased as a result of the reliance on online platforms and managing a broad menu has become a difficult task. The dilemma in this case study is twofold whether the quartet entrepreneurs should return to his beginnings, where he earned success, or rebrand his current business. Theory: Ideally this case is a very good application of small business branding. Branding helps to identify growth opportunities, generate ideas, and develop new market models. Innovative approaches need to be made even more effective with branding. Small businesses will reap the benefits of branding. Basis of the Case: Teaching case. Types of Case: Applied Decisional. Protagonist: Yes. Findings: The protagonist must decide whether to continue operating in the current mode through rebranding Pizza Club Genderia by changing the menu, focusing more on online sales, or adding new trendy products, or by relocating the shop in the food zone or return to the original burger business where they had earned very quick success and had business experience. Contribution: This teaching case study is an excellent resource for creating branding strategies for new food entrepreneurs. This case study is suitable for the course entrepreneurship under small business category. The new study also contributes to the existing literature, in addition to having practical consequences. This research is one of the best resources for understanding how an entrepreneur's early success can be leveraged to drive radical innovation within the company. This study's holistic analysis adds to previous research by establishing a set of three main factors (financial viability, customer retention, and a feasible business strategy) that should be addressed early in the innovation process.

Keywords: Foodpreneur, Rebranding, Informal Food Business

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Quality of Education and Value for Money in Private Business Schools of Bangladesh: Students' Perception

Muhammad Ziaulhaq Mamun* and Melita Mehjabeen**

ABSTRACT

This research studied the students' perception regarding the quality of education and value for money in private business schools in Bangladesh. A questionnaire including 42 distinct areas of student sensitivity clustered into 6 groups designed in a five-point Likert scale is used. The findings show that broadly the students are more satisfied with general, administrative & registry, and faculty resources. They are found least satisfied with financial offerings. In the areas of placement, career & perceived quality; academic, research & educational services; and facilities their satisfaction level is low and similar. Specifically, the respondents are satisfied with air-conditioning facilities, classroom cleanliness, classroom space, on-time registrations, education & communication skills of the faculty members, class schedules, and make-up classes. But the respondents are not much satisfied with transport, dormitory, recreation, and gym facilities. They are found indifferent to further study from the same university they studied. Overall, the respondents are found not receiving adequate value for their money. This study indicates that the private business schools should focus more on research and development facilities enabling the students to continue further education. The research open scope to investigate quality of education in private business schools in developing necessary skills for employability.

Keywords: Classroom Facilities, Faculty Credentials, Placement, Perceived Quality, Research, Tuition

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Service Quality of Intercity Bus and Rail Transportation in Bangladesh: Two Distinctive Population Study

Muhammad Ziaulhaq Mamun*

ABSTRACT

The study of the commuters' perception about service quality of road and rail transports revealed that buses need to discourage their drivers from speeding and reckless driving. Restroom facilities in stoppages and clean surrounding are ways to improve the bus services. Unaccounted passenger pickups, illegal goods trafficking should be stopped, and security should be ensured for the passengers. Bus companies need to maintain timely departure and arrival. Proper carriage of delicate goods and seats for disadvantaged can improve the bus service. However, the buses are found better in pre-purchase of tickets, tickets availability, service providers' accessibility, information about vehicle time and short waiting time for ticket purchase. On the other hand, areas of improvement in trains are controlling travel of un-ticketed passengers, preventing carriage of smuggled goods, stopping black market of tickets, stopping hijacking/mugging, and arranging seats for disadvantaged. Improving environment, restroom facilities, toilet cleanliness need to be improved for better service delivery. Lack of courtesy and cordial greeting of the passengers are causes of concern for passengers. Maintaining scheduled arrival and departure should be closely monitored. However, the trains are found better in careful driving, information availability, less vehicle breakdown, good ventilation, less accidents, better cooling facility and good lighting.

Keyphrases: Courtesy, Environment, Illegal Activity, Operational Efficiency, Physical Facilities

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Financial Performance of General Insurance Companies in Bangladesh: A 2003-2020 Evaluation

Muhammad Ziaulhaq Mamun* and Fairuz Chowdhury**

ABSTRACT

This paper analyzed the financial performance of the general insurance companies of Bangladesh over the period 2003-2020 by studying 18 general insurance companies out of 46 (including the only government owned company Sadharan Bima Corporation, SBC). In terms of net premium, the study found no definite industry trends; but the only nationalized insurance company (SBC) has around 1200% higher premium earnings than the private average. Also, SBC has the highest figures for both investment and investment income for the studied period. Average investment has increased in the private insurance sector steadily during 2003-2007, then onward there was sharp ups and downs; but SBC's investment growth has been steady all through. In the studied period, the net claims of most private insurance companies have increased significantly with an overall rising trend. SBC has been incurring the most net claims and its average is 2543.18% more than private insurance companies' average. Regarding APBT (annual profit before tax), SBC had a much higher figure than any of the private companies and is almost 1200% of the average of the private general insurance companies. ROTA for most of the companies is consistent throughout the studied years. The companies had their highest ROTA during 2008-2010. The average of the private insurances showed much more fluctuation than SBC. The study found very strong correlation between industry net premium and net claims. But majority of the sample companies depict a negative correlation between profit and share price. The study further noted that older companies were financially better off compared to the newly established companies. Also, among the private general insurance companies there is variability in performance. SBC, being the only public insurance company, has a lot of upper hand. Overall, it can be said that the general insurance sector is doing moderately well.

Keywords: APBT, Investment, Investment Income, Net Claim, Net Income, ROTA

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Technium Social Sciences Journal, Vol. 21, pp. 728-764, July 2021, ISSN: 2668-7798, URL: www.techniumscience.com, DOI: https://doi.org/10.47577/tssj. v21i1.3797, Year of Publication 2021

Slum Dwellers' Perception about Covid-19: A Study in Dhaka Metropolis Slums

Kaniz Fatima* and **Muhammad Ziaulhaq Mamun****

ABSTRACT

This research explored Dhaka slum dwellers' (n=434) using convenience, quota, and judgmental sampling) view about COVID-19, its causes, preventive measures, potential high-risk groups, self-awareness, transmission prevention, orthodox beliefs, and vaccine effectiveness using 56 simple variables grouped in eight complex variables. The slum dwellers viewed COVID-19 as a fatal and chronic disease spread by Chinese. They perceive that direct contact with infected persons, cough and sneeze droplets, and physical proximity cause the disease. Regarding preventive measures, they think that they must wear masks, frequently wash hands, face, and feet, use soap or hand sanitizer to wash hands. They assume that hot water gargle, more lime/lemon intake, sunlight exposure, and physical activities can reduce the risk of infection. They also perceive that people of any age bear the risk of contagion; but asthmatic, heart and diabetic patients fall in the high-risk group. The slum people self-protect covering nose and mouth while sneeze and cough, take precaution if tested positive, and maintain social distance. They take this disease seriously, as such, they wear masks, avoid guests, friends, and mass transports. They subscribed that if affected they will be in self-quarantine and follow prescribed movement and lockdown decisions to prevent transmission. They believe that home quarantine is for the infected persons only. Slum residents are found to recognize preventive mechanism and self-awareness tactics; but they are carried away by some religious beliefs like the disease is Allah's will, a curse from Allah, results of our misdeeds, and Allah will save COVID-affected people. Because of their doubt of vaccine effectiveness, they are not quite confident about taking vaccine. Overall, the respondents do not think that they are risk-free. It is found that some of their views are not factual, like COVID-19 is a chronic disease, spread by Chinese; sunrays, hot water gargle reduces risks; lime/lemon intake prevent the disease; or diabetic, asthmatic, and heart patients are at more risks. It is noted that most of the perceptional differences are observed with family types. Nuclear family respondents believe that cold weather causes it and perceive strongly that asthmatic patients are more susceptible to infection. They perceive similar risk of being affected if exposed to a diseased person; however, infected elderly people with comorbidities are more prone to serious illness. They blindly perceive that COVID-19 is all Allah's will. Education wise, the participants differ in their opinion in almost all the variables. Female slum members firmly believe that Chinese has brought the disease; but males are noted to be more self-aware than females. Married slum residents strongly believe that sunlight exposure and physical activities can prevent the disease and hold the misconception that COVID-19 is a curse from Allah and results of all our misdeeds. Irrespective of their literacy level all respondents believe that Allah will save COVID-affected people. Further, occupation-wise slum dwellers have similar viewpoint about preventing the disease and curbing community transmission. Slum residents' opinion related to causes of the disease and vaccination has no association with age and income. Older slum residents are found to be more self-aware and cautious in limiting disease transmission, although they possess stronger orthodox religious views and more dubious about vaccination. Slum dwellers' perception to several aspects of COVID-19 are noticed to be weakly positively related with income, indicating that even when the relatively higher income groups retain views closer to reality, their tendency to be conscious and abide by protective mechanism to reduce risk and control spread of the disease is less as opposed to insolvent slum inhabitants. The factor analysis has found that the grouping variables and the factor variables are quite consistent. It is noted that "self-awareness" and "risk reduction" are the most important factors followed by perception regarding COVID-19 vaccine. In short, slum dwellers are not observed to have a very clear idea about COVID-19, its causes, prevention mechanism, etc. They are aware of some methods of self-protection and deterrence of transmission. However, it is to be ensured that they strictly follow the methods to protect themselves and avoid community spread of the disease.

Keywords: Chronic, COVID-19, Fatality, Prevention, Risk Reduction, Self-Awareness, Slum, Transmission, Vaccine

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Effectiveness of SMS Advertising in Bangladesh: Drawing on Hierarchy of Effects Model

Muhammad Ziaulhaq Mamun*

ABSTRACT

The study explored the effectiveness of Short Message Service (SMS) advertising on customers' purchase decision focusing awareness, knowledge, liking, preference, conviction, and purchase attributes of Hierarchy of Effects Model. A total of 180 mobile phone subscribers were surveyed adopting non-probability convenience and judgmental sampling techniques through a structured questionnaire. It is found that none of the attributes have positive impact on the subscribers' behavior. Purchase is found to be the most ineffective attribute followed by Conviction and Liking. Awareness, Knowledge, and Preference are least ineffective ones. However, SMS ad which explicitly mentions the company name and offers in the title, somewhat gets subscribers' attention. It is noted that the SMS ads do not provide enough information, accessibility, and convenience. Brand loyalty and brand image of the products advertised have weak positive impact on consumer preference. The respondents view SMS ads mostly unconvincing and ineffective; but call rate packages, internet purchases and product discount purchases fared not so poorly. However, there are situations where SMS can be utilized effectively. As SMS advertising do not really incur much additional cost for the telecom companies, it can provide an avenue for information dissemination, as well as, to generate revenue from offers they promote.

Keywords: Awareness, Conviction, Knowledge, Liking, Preference, Purchase

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Issues of Micro-Insurance in Bangladesh: Policy Holders View

Muhammad Ziaulhaq Mamun*

ABSTRACT

Micro-insurance is mainly destined to risk protection for the low-income people on life, health, livestock, and agricultural products for a very low premium. This paper investigated the micro-insurance subscribers' perception on different issues through a structured questionnaire survey with 48 policy holders using convenience and judgmental sampling. The study showed that the subscribers are not happy about the field workers irregular field visit. The premium paid by the subscribers is found to be quite affordable and without much barrier they pay the premium regularly. But the subscribers believe that the compensation is not sufficient, and the processing time is significantly dissatisfying to them. The field and office workers' activities showed a little insignificant dissatisfaction. The study noted that the insurance companies do not update the policy related issues to the subscribers. Overall, the respondents are a little negative towards company activities. The respondents' education and income noted to be strongly correlated, but no significant relationship is found between the income and premium payment. But moderate negative relationship is observed between education and premium payment justifying that more educated consciously adopt policies that require less premium. This low negative correlation between education and compensation received can be justified as more educated consciously adopt policies that require less premium; hence they receive less compensation. Very strong correlation between office distance and premium and compensation may be due to field agents focus more on distant subscribers. Quite logically very strong significant correlation is observed between premium paid, and compensation received. Regularity of field visit by the agents, regular compensation payment and better awareness program and update can improve the scenario in this respect.

Keywords: Compensation, Customer Satisfaction, Micro-Insurance, Office Distance, Premium, Personnel Efficiency

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Cement Industries at a Flourishing Point: A Comparative Analysis between Selected Cement Companies of Bangladesh

Tanbir Ahmed Chowdhury*

ABSTRACT

The main objective of this paper is to analyze and compare the performance of cement industry in the context of Bangladesh. Six out of seven cement companies have been selected from Dhaka Stock Exchange in order to conduct the performance analysis based on a panel data. The study conducted various statistical measures like growth percentage, trend equation, and square of correlation coefficient over the span of five years. Results show that production, total sales, foreign sales, total assets, net income of selected cement companies achieve a stable growth pattern during the period of 2010-2018. Trend equation and square of correlation coefficient (r2) have been tested for different activities of cement companies where only total assets have a positive trend equation. The r2 of production, total assets, and total sales is more than 0.5 which indicates the bright prospect of cement industries in Bangladesh.

Keywords: Cement Company, Sales, Production, Bangladesh

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COVID-19 Pandemic – Challenges for Management Education in Bangladesh

Tanbir Ahmed Chowdhury*

ABSTRACT

Educational Management is a huge subject with many critical aspects related to management theories; different approach, and communication, different types of management models, which make the subject complicated and difficult to comprehend. Teacher is to teach the student as a whole person and it is here that teacher will find the study of educational management as one of vital significance. If teacher takes seriously their responsibilities even as a public worker, teacher will find their knowledge of educational management constantly in use. At this moment, the Covid-19 pandemic is the prescribed global threat to mankind and a significant difficulty we have faced since World War II (UNDP, 2020). Till 9th August 2020, Covid-19 has affected 188 countries across the world, with about 20 million confirmed cases and more than 700000 people lost their lives (BBC News, 2020). Therefore, this breakout is considered as a Public Health Emergency of international concern and officially proclaimed as a global pandemic by the World Health Organization on March 11, 2020 (WHO, 2020). This pandemic was first confirmed in Bangladesh by The Institute of Epidemiology, Disease Control and Research (IEDCR) on 8 March, 2020 and its first death on March 18, 2020(FE Report, 2020). The present study has been carried out to evaluate the effect of Covid-19 pandemic on the management education in Bangladesh. The analysis has been conducted mainly on data from secondary sources. From the sequence of our analysis, it seems clear that the management education in Bangladesh is in a process of change with the inclusion of new rules, technology over the relative position and strictly delineated functions of various types of educational institutions. Over the years the management education of Bangladesh has grown rapidly. In fact, management education in Bangladesh has widened but depth has to be achieved in true sense. The education must be made students friendly otherwise the depth cannot be achieved. We are quite optimistic that the management education in Bangladesh will get a boost if the suggested measures are implemented.

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Thinking 'Qualitative' Through a Case Study: Homework for a Researcher

Anup Chowdhury* and **Nikhil Chandra Shil****

ABSTRACT

This study portrays the necessary preparation of a qualitative researcher who intends to undertake case study research. Here, it is argued that the case study method identifies the holistic and meaningful characteristics of real-life events. This study has policy implications for the potential case study researchers. This present study raises the awareness of a case study researcher and highlights that a case researcher should be familiar with and follow a rational and effective process before designing the research. At the initial stage, a case study researcher should plan for an appropriate entry through formal and informal gatekeepers at the research site. The case researcher also needs to plan the periods in the fieldwork well in advance. This study also illustrates that the case researcher should know data generation and collection procedures and the techniques to analyzing case study data. As the case study data cannot be generalized the researcher needs to adopt a prior theoretical stance for validity, reliability, and generalizability of the case study data. In this study, it is argued that the case study is based on replication, not sampling logic. Therefore, in the case study, theoretical generalization is possible but not statistical generalization.

Keywords: Qualitative Research, Case Study, Case Study Data, Theoretical Framework, Generalization

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International Journal of Public Administration, Management and Economic Development, Vol. 6, No.2, pp. 3-25, Faculty of Administration and Economic Studies in Uherské Hradiště, Jagiellonian College in Toruń, Města Mayen, Czech Republic

Epitomes of New Public Management: Insights from Illustrative Literature on Worldwide Public Sector Reform Agendas

Anup Chowdhury* and **Nikhil Chandra Shil****

ABSTRACT

Traditional public organisations were run by rational rules and procedures. The structured hierarchies, formal decision-making processes and advancement based on administrative expertise were found in the traditional public organizations. These public organisations were motivated by political considerations than by financial considerations. However, these situations have changed and new mechanisms and approaches have been developed in the public sector for the delivery of public goods and services. To improve efficiency in management in the public sector a renewed interest has developed to implement private sector management practices in the public sector. These improved management practices not only have assisted in locating the inefficiencies of the past and ensuring better performance is achieved in the future, but also to make the public sector management and employees accountable for their actions and decisions. These elements of reforms also created a new orthodoxy in the public sector, namely 'New Public Management' (NPM). The present study is an earnest quest to explore the trends of these new management approaches which were implemented worldwide in different countries.

Keywords: New Public Management, Public Sector Reforms

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Performance Management Systems in Public Sector Under New Public Management Regime: An Australian Case

Anup Chowdhury* and **Nikhil Chandra Shil****

ABSTRACT

Performance management system in public sector has undergone significant changes in new public management regime. Countries adopting new public management have brought changes in styles and modalities of performance management in public sector with the sole purpose of ensuring service quality to the satisfaction of service recipients. This research has adopted a qualitative research methodology under epistemological and ontological paradigm of social inquiry to study the performance management system of a government owned department in Australian Capital Territory. Giddens' Structuration theory has been applied as theoretical framework to develop a thick description of social reality. An in-depth case study method has been used as a predominant research methodology supplemented by observation, interview and review of archival records. The study reveals that new public management ideology has been successful in ensuring performance of the department from multi-facet dimensions.

Keywords: Case Study, New Public Management, Public Sector Organization, Public Sector Organization Rawalpindi and Islamabad

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Determinants of Choosing a Foreign Brand in Emerging Economy: Lessons and Implication for the Local Entrepreneurs

Md. Abdul Momen*, Seyama Sultana**, **Farhana Ferdousi******* and Shamsul Huq Bin Shahriar********

ABSTRACT

Purpose- It is evident that the local small and medium enterprises of Bangladesh suffered in the competition because of the strong presence of foreign brands in the market. The purpose of this study is to figure out the factors influencing consumers to purchase a foreign brand predominantly among young consumers. Design/methodology/approach – It is a quantitative study considering 257 young demographics as respondents. They are drawn randomly. Confirmatory factor analysis, regression analysis and a path model of structural equation model using AMOS graphics software are used in this study to analyze the data. Findings – This study finds two out of three identified variables are influencing the foreign product purchase for the young Bangladeshi consumers. Brand value and product features of the given foreign product are the most dominant factors behind this adoption. However, a significant relationship between product quality and brand choice is not evident in this study. Research limitations/implications – It will give a clue to the small or medium startup of the country that normally target the young customer but face challenges to understand their mind and sometimes lagging because of the strong presence of the international brands. Originality/value – A comprehensive review of the literature suggests that not so many studies took place that determines the respective factors behind the purchase of foreign brands particularly among young demographics of a lower middle income developing nation.

Keywords: Consumer behavior, Foreign brands, Local entrepreneurs, Local brands Paper type Research paper

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Linking Perceived Price Fairness, Customer Satisfaction, Trust, and Loyalty: A Structural Equation Modeling of Facebook-Based E-Commerce in Bangladesh

Fabliha Tasnim Hride, **Farhana Ferdousi*** and Sajjad M. Jasimuddin

ABSTRACT

The data from the current research forms part of a broader study that analyzes the association between perceived price fairness, customer satisfaction, trust, and loyalty among social-commerce users. This study examines their relationship in the context of Facebook-based e-commerce in Bangladesh. Based on data obtained from 171 respondents to a self-administered questionnaire, it uses structural equation modeling and AMOS 21 software to test a research model and seven hypotheses. The study also tests and validates a Western instrument in the Asian context. In line with previous work, it reveals that perceived price fairness is positively related to customer loyalty, customer satisfaction, and trust, and that customer loyalty is also positively related to customer satisfaction and trust. However, it shows that customer satisfaction and trust do not mediate the relationship between perceived price fairness and customer loyalty. It provides practitioners with an understanding of key constructs in various forms that are causing the variation in customer loyalty. The research also provides useful insights for managers who wish to increase customer loyalty and offers guidance to those that intend to attract customers toward shopping, particularly via Facebook.

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A Case Study on the Entrepreneurial Process of Push and Pull Women Entrepreneurs

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ABSTRACT

The study presents two entrepreneurship typologies: necessity-driven and opportunity-driven. 'Opportunity' entrepreneurs start a business to pursue an opportunity, while 'necessity' entrepreneurship is requirement-based and attempts for the best option available in the absence of alternate employment opportunities. Push and pull effects are analogous to necessity-based and opportunity-based entrepreneurship. The study explored success through stages of the entrepreneurial process. The push entrepreneur proved her resilience despite the absence of spousal support. Behind the pull entrepreneur's success was spousal support. The key findings are that success is influenced by the entrepreneur's grit, willpower, and attitude. The objective of the case is to study two typologies of entrepreneurship, based on their motivation to become an entrepreneur—necessity-driven and opportunity-driven. It also examines the various factors that could influence the success of entrepreneurship. Both entrepreneurs discussed in the study had several common factors. The two succeeded in their entrepreneurship due to their sheer grit, determination and a feeling of higher purpose. Multiple pieces of evidences exist to show that grit is a success factor linked to positive outcomes. The phenomenon studied in this case include 'opportunity' and 'necessity' entrepreneurs. It also studied the push and pull effects in entrepreneurship, which are analogous to opportunity-based and necessity-based entrepreneurship. The push entrepreneur was involved in boutique business, and pull entrepreneur was in catering business. The findings are that the push entrepreneur demonstrated resilience despite many drawbacks. The success of the pull entrepreneur's involved spousal support too. In both cases, the critical finding is that success is influenced by the entrepreneur's grit, willpower and attitude. Further, neither of the women entrepreneurs took any loan to fund their business. Both entrepreneurs discussed in the study had a few common factors. Both of them were educated. The two entrepreneurs exhibited grit, determination and a feeling of higher purpose. Grit has been found to be a success factor and linked to positive outcomes.

Keywords: Push Entrepreneur, Pull Entrepreneur, Entrepreneurial Process, Case Study, Dhaka

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Changes in Consumer Purchasing Behavior Due to COVID- 19 Pandemic

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ABSTRACT

Due to the COVID-19 pandemic, the world is facing historical challenges without prior preparation. Because of the unavoidable economic crisis for the shutdown of numerous trade and industrial activities the COVID-19 pandemic has triggered substantial modifications in the habits of consumers all over the world. The pandemic has led to key changes in consumers purchasing and consumption behavior as the result of lockdown, social distancing, and uncertainty about the future due to its infectious nature. This study investigated the impact of the pandemic outbreak on consumers' purchasing and consumption behavior in a developing country such as Bangladesh. An online survey was conducted for collecting data about the changes in buying behavior through a structured questionnaire. The research targeted 200 respondents belonging to different age-gender segments, qualifications & occupations, and household monthly income. The 191 completed responses had received and analyzed among 200 distributed structured questionnaires. The Partial Least Squares (PLS-SEM) method was applied, with the Smart PLS software v.3.3.2 for analyzing the proposed theoretical model and to test the developed hypotheses. The outcomes of the research strongly indicate that the health and safety concern, imposed restrictions, financial condition, surrounding environment-people, and other realities caused a remarkable change in consumer buying behavior. The outcomes of this study provide significant guidance to policy interventions, marketing decisions, and strategies for doing business as usual during and after the pandemic and perhaps add to the understanding of this unprecedented and ongoing phenomenon.

Keywords: COVID-19 Pandemic, Consumer Behavior, TPB Model, Panic Buying, Online Shopping, Risks Perception

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A Critical Assessment of Interrelationship among Corporate Governance, Financial Performance, Refined Economic Value Added to Measure Firm Value and Return on Stock

Leo Vashkor Dewri*

ABSTRACT

The purpose of this study is to measure firm value (FV) and return on stock (RoS) by considering corporate governance (CG), financial performance (FP), and refined economic value added (REVA) combinedly and also identify the convergence among these three parameters. The GMM estimator's method was applied on the dataset of Dhaka Stock Exchange listed firms during the period 2013 to 2018. The sample contains 310 firms with 1860 firm years. The study reveals that CG, FP, and REVA characteristics are significantly conjuncted with FV and RoS. Firms, regardless of size, age, and nature, adopting good CG within business management practice can significantly improve FP and continuously generate positive economic value for both firms and shareholders over the period, thus enhance FV and RoS. Moreover, firms confirming continuous growth of FV are able to provide positive RoS to shareholders. This study ensures necessary guidelines for both firms' manager and investors, as managers will be encouraged to implement good CG within the firms and confirmed to maintain healthy FP and continues REVA growth for the firm. Investors can assess firm performance and future growth opportunities before taking any investment decision.

Keywords: Firm Value, Return on Stock, Corporate Governance , Financial Performance, Refined Economic Value-Added

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Measuring Firms Intrinsic Values in an Emerging Economy: Evidence from Bangladesh

Leo Vashkor Dewri*, Md. Rashidul Islam, Fatema-Tuz-Johra***** and M Mizanur Rahman****

ABSTRACT

This study considered three parameters to measure firms' intrinsic values: corporate governance, paid-up capital size, and dividend payout policy. These were used as independent variables, and market interest rate was used as the control variable. To measure these parameters, daily trade data was observed from both the Dhaka Stock Exchange (DSE) and the Chittagong Stock Exchange (CSE) data repositories and covered a total of 1475 firm years' disclosures from 2013 to 2017 to conclude the analysis. The study revealed that there is a significantly negative correlation with firms' intrinsic values and corporate governance due to the majority of firms failing to adhere to corporate governance guidelines and therefore generate higher intrinsic values. Also, firms in emerging economies are characterized by a high level of family ownership and lack of transparency. Similarly, there is a significant negative relationship with firms' intrinsic values and higher capital-based firms, and there is no significant relationship with the firms' intrinsic values and dividend payout policies in the emerging economy.

Keywords: Intrinsic Value, Corporate Governance, Volume of Capital, Dividend Policy

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Corporate Social Responsibility, Innovation Capability and Firm Performance: Evidence from SME

Md Rashidul Islam*, Dawit Bahta, Jiang Yun and Muhammad Ashfaq

ABSTRACT

Purpose – The purpose of this paper is to examine corporate social responsibility (CSR) and its effect on small and medium enterprises' (SMEs) innovation capability and financial performance from the perspective of a developing country. It also aims to explore the role of innovation capability as a mediating factor in the linkage between CSR and SMEs' financial performance. Design/methodology/approach – A questionnaire was distributed among managers/owners of the sampled companies. Using a data set of 402 Eritrean firms and partial least squares structural equation modeling, direct and mediating effects were tested. Findings – The result reveals that CSR has a positive and significant effect on the financial performance and innovation capability of SEMs. Besides, innovation capability has a positive and significant effect on the business performance of SMEs. The result also supports a partial mediation effect of innovation capability on the association between CSR and firm performance. Practical implications – The findings from this research could enhance the awareness of the entrepreneurs, researchers and policymakers on CSR-SMEs' relationship and help understand the importance of CSR as a crucial driver mechanism for companies to become more innovative and competitive. Originality/value – By empirically examining the relationship between CSR, innovation capability and performance in SMEs, this study contributes to the ongoing scholarly discussion on the linkage between CSR and financial performance. Also, to the best of the authors' knowledge, no other study investigated the mediating role of innovation capability on the link between CSR activities and firms' financial performance in SMEs from a developing country perspective, making substantial contributions to research in terms of theory, practice and policy.

Keywords: Corporate Social Responsibility, Developing Country, Financial Performance, Innovation, Small and Medium-Sized Enterprise

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Family Firm's Propensity to Lean Innovation in the Emerging Economy: A Moderating Role of Executive's Compensation

Md Rashidul Islam*, Muhammad Zulfiqar**, Sadeen Ghafoor*** and Muhammad Usman Yousaf***

ABSTRACT

Purpose – The purpose of this study is to investigate the empirical relationship between family firms and lean innovation (i.e. generating more output with less input) as well as the moderating role of the executive's compensation. Design/methodology/approach – Panel data for ten years (2007–2016) have been collected from the CSMAR database. This study concludes the findings using descriptive statistics, correlation and panel data analysis techniques applying statistical software STATA. Findings – Results show that family firms are not motivated to follow lean innovation strategies until unless the executives are compensated well. We further find that family firms are more likely to pursue a lean innovation strategy, and they demonstrate a superior record of converting R&D inputs as granted patents, and; both input and output innovation are significantly affected by executive compensations. However, this study shows an insignificant negative relationship of propensity to patents with the moderating effects of executive compensation. Research limitations/implications – This research has been conducted on the emerging Chinese market. The study is useful for policymakers and managers to devise such strategies which can make the role of executive's more effective to reduce the agency cost and reap the benefits of innovation input more effectively (Petersen, 2009). Also, family firms are heterogeneous, and the research outcome may be applicable for both advanced and emerging economies. Originality/value – The previous family firm's research paid less attention to the role of the executive's compensation on the relationship of family firms and lean innovation. Moreover, they prioritize insight into how executive's compensation affects different proxies of innovation. This study sheds new light on the paradoxical findings of family firms and lean innovation by analyzing the significant role of executive compensation.

Keywords: Family Firms, Lean Innovation, Executive Compensation, RDI, Stewardship Theory, RBV, Agency Theory

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Private Firm Performance: Do Women Directors Matter?

Mahnoor Sattar*, Pallab Kumar Biswas** and Helen Roberts***

ABSTRACT

Purpose This paper examines the relationship between board gender diversity and private firm performance. Design/methodology/approach We test the association between board gender diversity and private firm performance by estimating pooled multivariate regressions using an unbalanced panel dataset of 115,253 firm-year observations. Findings We find that younger, less busy, and local women directors enhance private firm performance. Firms with 40% or more women directors report triple the economic benefits compared to boards with at least 20% women directors. Considering firm size, women directors significantly increase small firm profitability, and the effect is more pronounced for high risk firms. Greater board gender diversity enhances small firm performance as the monitoring role of women directors benefits the firm even in the presence of busy men directors. Consistent with the agency theory framework, we find that women directors improve small firm profitability in the presence of agency costs. Practical implications Our results point to the need for private firms to increase board gender diversity and consider women director busyness, age, nationality, and firm size when making board director appointments. Originality/value This study adds to the scarce existent literature investigating private firms. The results contribute to the understanding of gender-diverse boards as well as the attributes of women directors that enhance private firm performance.

Keywords: UK Private Firms, Board Gender Diversity, Women Directors, Firm Performance, Women Director Attributes

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Corporate Finance Policies, Subsidies and R&D: Evidence from China

Wei Huang* and **Mahnoor Sattar***

ABSTRACT

This paper develops an agency theory based conceptual framework to investigate the interconnections among corporate finance policies, subsidies and R&D investment. We empirically test our predictions using a sample of listed high-tech firms from China during 2007–2015. Our baseline results support a positive subsidies-R&D relationship. Subsequent tests using non-linear models further point out that this relationship is inverted U-shaped. In line with our conceptual framework, we show that the marginal effect of subsidies is diminishing and turns negative particularly among firms with higher dividend payout, lower investment efficiency, and lesser cashflow constraints. These findings ascertain the importance of internal corporate governance structure in facilitating regulatory policy implementation and effectiveness.

Keywords: China, Market Failure, R&D Intensity, Subsidy

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The Economics of Solid Waste Management and Drainage: A Sustainable Approach for Making South Asian Cities Climate-Resilient

A.K. Enamul Haque* and Mani Nepal

ABSTRACT

Cities in low-income countries are facing increasing threats of waterlogging and water contamination from improperly managed solid waste. Some of the responsible factors include a) rapid growth in urban population which has resulted in city areas expanding into low-lying flood-plains, b) climate change, which is likely to trigger increased intensity in rainfall events that would overwhelm the city drainage systems, and c) indiscriminate dumping of solid waste which might clog the drainage system resulting in water logging. In order to understand the economics of the solid waste management and water logging issue, the South Asian Network for Development and Environmental Economics (SANDEE), in collaboration with the Asian Center for Development (ACD), conducted a study in Bharatpur (Nepal) and Sylhet (Bangladesh) using a variety of methods including hydrodynamic modeling, hedonic price model, randomized controlled trial, and choice experiment between 2017 and 2020.

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A Survey Report on the Garment Workers of Bangladesh

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ABSTRACT

Bangladesh is among the five fastest growing economies in the world with an average growth rate of 7.39% (2015-2019) in its Gross Domestic Product (GDP) (Ministry of Finance, 2020). Its GDP is nearly USD 317 billion and it is the 41st largest economy of the world (World Bank, 2020). Based on this, the Asian Center for Development (ACD) completed the first comprehensive survey on workers of the garment industry in Bangladesh in 2014 (Haque & Bari, 2015) and reported the impact of this sector in terms of workers' welfare, women empowerment, and overall socio-economic changes in the workers' life. Five years later, ACD has conducted this second comprehensive survey on the workers to understand the changes. Against this backdrop, this research is initiated to study the changes in the socio-economic conditions of garment workers in Bangladesh. The broad objective of the study is to assess the current status of employment in garments sector and living conditions of the workers and their family members. The specific issues considered in the survey are to assess: (i) The status of employment in the sector (ii) The status of living standards (iii) The status of environment in the workplace (iv) The status of wages, income, asset, and expenditure (v) The status of women empowerment.

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A Tale of the Financial Inclusion-Growth Nexus and the Degree of Financial Inclusion: A Dynamic Panel Approach on Selected Developing Countries

Biplob Kumar Nandi*, **Gazi Quamrul Hasan**** and **Md. Humayun Kabir*****

ABSTRACT

Purpose: This study aims to examine the impact of financial inclusion on per capita gross domestic product (GDP) at varying degrees of financial inclusion for a sample of 76 developing countries between 2011 and 2017. To evaluate the heterogeneous impact, this paper constructs the multi-dimension index of financial inclusion to classify sample countries into two sub-samples in terms of the value of FIID, taking account of three dimensions of financial inclusion: access, usage and availability. Design/methodology/approach: This study attempts to identify the presence of reverse causality and long-run relationship between financial inclusion and economic growth by using the Granger causality test (Wald test) and three alternative panel cointegration tests (Kao Test, Pedroni Test, Westerlund Test) respectively. Because of the existence of the bi-directional causality between financial inclusion and per capita GDP, this study uses a fixed effect instrumental variable model with lagged dependent variable to get unbiased estimators from the panel regressions for sample countries. Findings: This paper finds a strong positive impact of financial inclusion on per capita GDP growth in sample developing countries, controlling for labor market structure, financial institutions' efficacy, infrastructural and governance issues. This study suggests that economic growth will be high in developing economies with a higher level of financial inclusion; however, the positive impact for two sub-samples countries (low and medium level of inclusion and high level of inclusion) are heterogeneous. The estimated result explains that a 1% increase in the financial inclusion index leads to a 0.0153% point increase in the per capita GDP for the countries with a low and medium level of financial inclusion, while this positive impact is significantly higher, 0.0794% point for countries with the high level of financial inclusion. This study also suggests that the higher concentration in the financial market by few agents and the lower level of governance may have an adverse impact on economic growth for the economies with a low and medium level of financial inclusion. Originality/value: This study is an original study that contributes to the research gap by explaining the heterogeneous impact of financial inclusion on economic growth at varying degrees of inclusion in the two sub-sample countries. Moreover, this study posits greater appeal as it explores the issue using the sample of only developing economies.

Keywords: Financial Inclusion, Financial Inclusion Index, Economic Growth, Panel Granger Causality, Panel Fixed Effect Instrumental Variable (FEIV Method, Degree of Financial Inclusion, Developing Countries, Financial Institutions and Services, Economic Growth and Aggregate. Productivity

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Cancer Related Knowledge, Attitude, and Practice Among Community Health Care Providers and Health Assistants in Rural Bangladesh

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ABSTRACT

Background: Cancer remains one of the primary causes of death in Bangladesh. The success of cancer control in rural areas depends on the ability of the health care system and workforce to identify and manage cases properly at early stages. Community Health Workers (CHW) can play a vital role in this process. The present study aims to assess cancer related Knowledge, Attitude, and Practice (KAP) among 2 categories of CHWs - Community Health Care Providers (CHCP) and Health Assistants (HA) in rural Bangladesh. Methods: A descriptive cross-sectional study was conducted using a self-administered questionnaire from July 2019 to June 2020. Multi-stage sampling technique was used to determine the sample. One Upazilla Health Complex (UHC) from each of the eight administrative divisions of Bangladesh were randomly chosen as study sites, from which 325 CHCPs and HAs were in the final sample. Multivariate logistic regression models were developed to determine the association between KAP scores and demographic variables. Results: Our study shows that a modest number of respondents scored above average in the knowledge (54.15%), attitude (58.15%), and practice (65.54%) sections. Majority CHCPs (90.91%) and HAs (96.06%) did not receive govt. training on cancer. Only 20.71% HAs and 25.2% CHCPs knew about the availability of cancer treatment options in Bangladesh. Uncertainty about the availability of relevant treatments or vaccinations at public facilities was also high. Having cancer in the family, income, duration of employment and workplace locations were important predictors of cancer related KAP scores. Conclusion: Healthcare workforce's knowledge gap and unfavorable attitude towards cancer may result in poor delivery of care at the rural level. For many people in rural areas, CHCPs and HAs are the first point of contact with the healthcare system and thus effective cancer control strategies must consider them as key stakeholders. Targeted training programs must be adopted to address the cancer related KAP gaps among CHCPs and HAs.

Keywords: Healthcare Workforce, Community Health Care Provider, Health Assistant, Cancer, Knowledge, Attitude, Practice, KAP, Rural Health, Community Clinics

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Impact of Commercial Floodplain Aquaculture on Common-Pool Resource Dependent Community

Tanzina Nazia* and **Afia Fahmida Daizy****

ABSTRACT

Aquaculture in pond and floodplain was accelerated in Bangladesh in the 1990s as a means of better production and income which was backed by the donor agencies, NGOs, and the government. Currently, the commercial actors are involved in the aquaculture systems due to the availability of production technologies and inputs. This paper aims to explore how the commercialization and privatization of floodplain aquaculture become the cause of the sufferings of the natural resource-dependent people and biodiversity loss in the floodplains. Now, Influential people hold control of the common pool floodplains and restricted the access of the Small-Scale Fishers (SSF) to manage the aquaculture. Our findings suggest that the SSF, for whom the seasonal floodplains were an important source of livelihood, their livelihood has been destroyed and overall wellbeing have been negatively affected. Besides that, lending enough evidence to the increased inequality, a new group of poor has emerged. Because instead of ensuring the welfare of SSF, Bangladesh government has leased the floodplain lands to the powerful rich people. In addition to growing inequalities, natural resource degradation has welcomed social vulnerabilities. However, no development initiative will ever be sustainable and effective if the existing socio-ecological setting is not considered. Bangladesh government should take robust attempts to revisit fisheries policies to ensure livelihood resilience of fisheries resource-dependent community by managing the access rights of the common pool resources.

Keywords: Blue Revolution, Biodiversity, Small-Scale Fisher, Fisheries Management, Food Security, Gender Relation, Access Rights

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Long-run Impact of Globalization, Agriculture, Industrialization and Electricity Consumption on the Environmental Quality of Bangladesh

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ABSTRACT

This study strives to assess the long-run dynamic relationship between carbon emission, and phenomena such as globalization, industrialization, electricity consumption, and agriculture for Bangladesh by utilizing annual time series data for 1971-2014. To this end, ARDL co-integration approach is utilized in this study to investigate the particularly targeted dynamics. The findings reveal strong positive long-run relation between carbon emission, and globalization, and electricity consumption while exhibiting weak relation between emission, and industrialization. For agriculture, no significant long-run relation could be found. The current economic status of the country is liable for the relation dynamics. Improvement from the existing physical, and governance infrastructure of the country holds the key to mitigating the emission problem generating as a by-product of growth, and globalization in general.

Keywords: Climate Change, Economic Growth, Carbon Emission, Energy Consumption, Co-Integration, Environmental Economics

JEL Classifications: C32, F64, Q56

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The Bangladesh Competition Law – Improving the Efficiency of the Market

A.K. Enamul Haque*

ABSTRACT

The economy of Bangladesh is the 41 st largest economy in the world. This means only 40 countries in the world are bigger than Bangladesh. To put things into perspective, the Malaysian economy is only 18% bigger than Bangladesh's and if the current growth rates persist, the Bangladeshi economy overtake the Malaysian economy by 2025. However, pursuing economic growth requires careful planning. There is a need to ensure continuous economic growth and promotion of justice and equity in the society. In this aspect, a market, which is a source of economic growth, needs to be fair. If it is controlled by a few, it may lead to both inequality and exploitation in society. In this situation, consumers pay a higher price and new and small producers cannot enter the market. As such, there is a need to ensure that the markets remain competitive. In this context, the competition laws are used by governments to ensure that the markets remain fair and so it continues to extract investments, protects young investors and brings prosperity in the society. This article analyzes the Competition Act of Bangladesh with a view to understand its implications for the economy of Bangladesh. Since the law is yet to be fully implemented so this article provides a comparative legal analysis in order to see how it might be implemented through regulations in order to achieve the objectives of the law as stipulated in its preamble.

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An Overview of Global Epidemics and the Challenges Faced

Nizam Uddin* and **Thamina Acter***

ABSTRACT

In this chapter, the global epidemiological events causing infections that ravaged humanity throughout its existence by bringing hardship to rich and poor nations alike are aggregated and presented. Among these, the largest known epidemics including the recent COVID-19 pandemic will be highlighted along with the analysis of the actual and common reason behind the occurring of all the epidemic scenarios. The epidemiological and nonepidemiological impacts of the most fatal pandemics recorded in history are also discussed. The vulnerable countries' readiness for coping with epidemics is assessed in terms of different indices. Furthermore, the current and future challenges in fighting epidemiological events are on the frontline and a number of preparative measures and strategies have been suggested.

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Theoretical Investigation on the Impact of Two HDR Dampers on First Modal Damping Ratio of Stay Cable

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ABSTRACT

Stay cables are one of the vital components of a cable-stayed bridge. Due to their flexible nature, stay cables are vulnerable to external excitation and often vibrate with large amplitude under wind action which leads to the fatigue failure of the cables. To suppress such kind of large amplitude vibration by improving the damping ratio of the cable various dampers such as magnetorheological damper, friction damper; oil damper; or high damping rubber (HDR) damper are utilized and gained popularity over time. This paper focuses on improving the damping ratio of stay cables using a combination of two HDR dampers. First, the theoretical model is formulated considering cable bending stiffness to evaluate the damping effect of cable-HDR dampers system. Then, the impact of various design parameters of HDR dampers on cable damping considering the cable stiffness is performed. The comparative analysis of results shows that the considered parameters such as loss factor, spring factor, and installation location of dampers have much effect on the stay cables damping ratio. Finally, the optimal parameters of the two HDR dampers are proposed for damper design.

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Influence of Planar Irregularities on Seismic Responses of RC Building

Md. Naimul Haque*, Md. Basir Zisan, Md. Golam Kibria and Ayan Kumar Dey

ABSTRACT

Understanding and predicting the behavior of buildings is a prime engineering interest for better seismic design of building system and this becomes even more important for buildings with planar irregularities. In this study, a detailed numerical investigation was carried out to enhance the understanding of seismic responses of buildings with planar irregularity. Four common and widely visible irregular shapes viz. C, L, I, and T shapes were considered. Two ground excitations with different ranges of dominant frequency were utilized to excite the irregular buildings. Both the modal and time history analyses were carried out and important dynamic features such as modal characteristics, base shear, roof displacement, roof acceleration, and drift of the irregular buildings were predicted. Different irregularity parameters in terms of planar geometry of the buildings were defined to find the most appropriate parameter to represent the seismic responses of the irregular buildings. It was found that among the various irregularity parameters defined, the overall aspect ratio i.e., L/B ratio of buildings are highly correlated with the seismic responses of the buildings. However, the seismic responses of the irregular buildings varied a lot from each other depending on the nature of the earthquake and planar irregularity. It was also found that I and T shapes buildings had the highest seismic responses among the considered buildings.

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Reduction of Bias and Uncertainty in Regional Seismic Site Amplification Factors for Seismic Hazard and Risk Analysis

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ABSTRACT

Site amplification factors in National Building Codes are typically specified as a function of the average shear wave velocity over the first 30 m (Vs30) or site class (A, B, C, D and E) for defined ranges of Vs30 and/or ranges of depth to bedrock. However, a single set of amplification factors may not be representative of site conditions across the country, introducing a bias in seismic hazard and seismic risk analyses. This is exemplified by significant differences in geological settings between East and West coast locations in North America. Western sites are typically characterized by lower impedance contrasts between recent surface deposits and bedrock in comparison to Eastern sites. In North America, site amplification factors have been derived from a combination of field data on ground motions recorded during West Coast earthquakes and numerical models of site responses that are meant to be representative of a wide variety of soil profiles and ground motions. The bias on amplifications and their impact on seismic hazards is investigated for the Montreal area, which ranks second for seismic risks in Canada in terms of population and hazard (PGA of 0.25 g for a 2475 years return period). Representative soil profiles at several locations in Montreal are analyzed with 1-D site response models for natural and synthetic ground motions scaled between 0.1 to 0.5 g. Since bedrock depths are typically shallow (<30 m) across the island, bedrock shear wave velocities have a significant influence on the impedance contrast and amplifications. Bedrock shear wave velocity is usually very variable due to the differences in rock formations, level of weathering and fracturing. The level of this uncertainty is shown to be greatly decreased when rock quality designation (RQD) data, common information when bore hole data are logged, is available since it is highly correlated with both shear and compression wave velocities. The results are used to derive region-specific site amplification factors as a function of both Vs30 and site fundamental frequency and compared to those of the National Building Code of Canada (2015). The results of the study indicate that there are large uncertainties associated with these parameters due to variability in soil profiles, soil properties and input seismic ground motions. Average and confidence intervals for the mean and for predictions of amplification factors are calculated for each site class to quantify this uncertainty. Amplifications normalized relative to class C are obtained by accounting for the correlation between site class amplifications for given ground motions. Non-linearity in the analysis of equivalent linear 1-D site response is taken into account by introducing the non-linear G/Gmax and damping ratios curves. In this method, it is assumed that the shear strain compatible shear modulus and damping ratio values remains constant throughout the duration of the seismic excitation. This assumption is not fully applicable to a case when loose saturated soil profile undergo heavy shaking (PGA > 0.3 g). In this study, all simulations with input motion PGA >0.3 g have been performed by using the EL method instead of the NL method considering that cohesive soils (clay and silt) at Montreal sites are stiff and cohesionless soils (sand and gravel) are considerably dense. In addition, the field and laboratory data required to perform NL analyses are not currently available and may be investigated in future works.

Keywords: Site Fundamental Frequency, Rock Quality Designation, Rock Motion, Peak Ground Acceleration, Spectral Acceleration, Structural Period, Shear Wave Velocity Randomization, Probability Density Function, Short Period Site Factor, Long Period Site Factor, Damping Ratio Curves, Shear Modulus Reduction Curves

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An Integrated Machine Learning Model for Indoor Network Optimization to Maximize Coverage

Ahmed Wasif Reza*, Abdullah Al Rifat and Tanvir Ahmed

ABSTRACT

Indoor network optimization is not a simple task due to the obstacles, interference, and attenuation of the signal in an environment. Intense noises can affect the intelligibility of the signal and reduce the coverage strength significantly which results in a poor user experience. Most of the existing works are associated with finding the location of the devices via different mathematical and generic algorithmic approaches, but very few are focused on implying machine learning algorithms. The purpose of this research is to introduce an integrated machine learning model to find maximum indoor coverage with a minimum number of transmitters. The users in the indoor environment also have been allocated based on the most reliable signal strength and the system is also capable of allocating new users. K-means clustering, K-nearest neighbor (KNN), support vector machine (SVM), and Gaussian Naïve Bayes (GNB) have been used to provide an optimized solution. It is found that KNN, SVM, and GNB obtained maximum accuracy of 100% in some cases. However, among all the algorithms, KNN performed the best and provided an average accuracy of 93.33%. K-fold cross-validation (Kf-CV) technique has been added to validate the experimental simulations and re-evaluate the outcomes of the machine learning models.

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ModCOVNN: A Convolutional Neural Network Approach in COVID19 Prognosis

Ahmed Wasif Reza*, Jannatul Ferdous Sorna, Md. Momtaz Uddin Rashel and Mir Moynuddin Ahmed Shibly

ABSTRACT

COVID-19 is a devastating pandemic in the history of humankind. It is a highly contagious flu that can spread from human to human. For being so contagious, detecting patients with it and isolating them has become the primary concern for healthcare professionals. However, identifying COVID-19 patients with a Polymerase chain reaction (PCR) test can sometimes be problematic and time-consuming. Therefore, detecting patients with this virus from X-ray chest images can be a perfect alternative to the de-facto standard PCR test. This article aims at providing such a decision support system that can detect COVID-19 patients with the help of X-ray images. To do that, a novel convolutional neural network (CNN) based architecture, namely ModCOVNN, has been introduced. To determine whether the proposed model works with good efficiency, two CNN-based architectures – VGG16 and VGG19 have been developed for the detection task. The experimental results of this study have proved that the proposed architecture has outperformed the other two models with 98.08% accuracy, 98.14% precision, and 98.4% recall. This result indicates that proper detection of COVID-19 patients with the help of X-ray images of the chest is possible using machine learning methods with high accuracy. This type of data-driven system can help us to overcome the current appalling situation throughout the world.

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Pre-Trained Deep Learning Models in Automatic COVID-19 Diagnosis

Ahmed Wasif Reza*, Jannatul Ferdous Sorna, Md. Momtaz Uddin Rashel and Mir Moynuddin Ahmed Shibly

ABSTRACT

Coronavirus Disease (COVID-19) is a devastating pandemic in the history of mankind. It is a highly contagious flu that can spread from human to human without revealing any symptoms. For being so contagious, detecting patients with it and isolating them has become the primary concern for healthcare professionals. This study presented an alternative way to identify COVID-19 patients by doing an automatic examination of chest X-rays of the patients. To develop such an efficient system, six pre-trained deep learning models were used. Those models were: VGG16, InceptionV3, Xception, DenseNet201, InceptionResNetV2, and EfficientNetB4. Those models were developed on two open-source datasets that have chest X-rays of patients diagnosed with COVID-19. Among the models, EfficientNetB4 achieved better performances on both datasets with 96% and 97% of accuracies. The empirical results were also exemplary. This type of automated system can help us fight this dangerous virus outbreak.

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Network Intrusion Detection: An Analytical Assessment using Deep Learning and State-of-the-Art Machine Learning Models

Md. Al-Imran and **Shamim Ripon***

ABSTRACT

The internet connected devices are prone to cyber threats. Most of the companies are developing devices with built-in cyber threat protection mechanism or recommending prevention measure. But cyber threat is becoming harder to trace due to the availability of various tools and techniques to bypass the normal prevention measures. A data mining-based intrusion detection system can play a key role to handle such cyberattacks. This paper proposes a threefold approach to analyzing intrusion detection system. In the first phase, experiments have been conducted by applying SVM, Decision Tree, and KNN. In the second phase, Random Forest, and XGBoost are applied as lately they have been showing significant improved performance in supervised learning. Finally, deep learning techniques, namely, Feed Forward, LSTM, and Gated Recurrent Unit neural network are applied to conduct the experiment. Kyoto Honeypot Dataset is used for experimental purpose. The results show a significant improvement in IDS outperforming the state of the arts on this dataset. Such improvement strengthens the applicability proposed model in IDS.

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Convolutional Neural Network-based Ensemble Methods to Recognize Bangla Handwritten Character

Md. Al-Imran and **Shamim Ripon***

ABSTRACT

In this era of advancements in deep learning, an autonomous system that recognizes handwritten characters and texts can be eventually integrated with the software to provide better user experience. Like other languages, Bangla handwritten text extraction also has various applications such as post-office automation, signboard recognition, and many more. A large-scale and efficient isolated Bangla handwritten character classifier can be the first building block to create such a system. This study aims to classify the handwritten Bangla characters. The proposed methods of this study are divided into three phases. In the first phase, seven convolutional neural networks i.e., CNN-based architectures are created. After that, the best performing CNN model is identified, and it is used as a feature extractor. Classifiers are then obtained by using shallow machine learning algorithms. In the last phase, five ensemble methods have been used to achieve better performance in the classification task. To systematically assess the outcomes of this study, a comparative analysis of the performances has also been carried out. Among all the methods, the stacked generalization ensemble method has achieved better performance than the other implemented methods. It has obtained accuracy, precision, and recall of 98.68%, 98.69%, and 98.68%, respectively on the Ekush dataset. Moreover, the use of CNN architectures and ensemble methods in large-scale Bangla handwritten character recognition has also been justified by obtaining consistent results on the BanglaLekha-Isolated dataset. Such efficient systems can move the handwritten recognition to the next level so that the handwriting can easily be automated.

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A Biological Data-Driven Mining Technique by using Hybrid Classifiers with Rough Set

Linkon Chowdhury, Md Sarwar Kamal, **Shamim H. Ripon***, Sazia Parvin, Omar Khadeer Hussain, Amira Ashour and Bristy Roy Chowdhury

ABSTRACT

Biological data classification and analysis are significant for living organs. A biological data classification is an approach that classifies the organs into a particular group based on their features and characteristics. The objective of this paper is to establish a hybrid approach with naive Bayes, apriori algorithm, and KNN classifier that generates optimal classification rules for finding biological pattern matching. The authors create combined association rules by using naïve Bayes and apriori approach with a rough set for next sequence prediction. First, the large DNA sequence is reduced by using k-nearest approach. They apply association rules by using naïve Bayes and apriori approach for the next sequence pattern. The hybrid approach provides more accuracy than single classifier for biological sequence prediction. The optimized hybrid process needs less execution time for rule generation for massive biological data analysis. The results established that the hybrid approach generally outperforms the other association rule generation approach.

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Data Mining Approach to Analyzing Intrusion Detection of Wireless Sensor Network

Md Alauddin Rezvi, Sidratul Moontaha, Khadija Akter Trisha, Shamse Tasnim Cynthia and **Shamim Ripon***

ABSTRACT

Wireless sensor network (WSN) is a collection of wireless sensor nodes which are distributed in nature and a base station where the dispersed nodes are used to monitor and the physical conditions of the environment is recorded and then these data are organized into the base. Its application has been reached out from critical military application such as battlefield surveillance to traffic, health, industrial areas, intruder detection, security and surveillance. Due to various features in WSN it is very prone to various types of external attacks. Preventing such attacks, intrusion detection system (IDS) is very important so that attacker cannot steal or manipulate data. Data mining is a technique that can help to discover patterns in large dataset. This paper proposed a data mining technique for different types of classification algorithms to detect denial of service (DoS) attacks which is of four types. They are Grayhole, Blackhole, Flooding and TDMA. A number of data mining techniques, such as KNN, Naïve Bayes, Logistic Regression, support vector machine (SVM) and ANN algorithms are applied on the dataset and analyze their performance in detecting the attacks. The analysis reveals the applicability of these algorithms for detecting and predicting such attacks and can be recommended for network specialist and analysts.

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An Analytical Evaluation of a Deep Learning Model to Detect Network Intrusion

Md Al-Imran, Kazi Jahidur Rahaman, Mohammad Rasel and **Shamim H. Ripon***

ABSTRACT

Widespread use of internet connected devices results in a flow of data among the connected devices. This has led to creating these network systems prone to different type of cyber attacks among which network intrusion is one of a kind. To detect network intrusion, an intrusion detection system (IDS) is placed in the system. The previous works in this field classify the attack mainly with traditional machine learning algorithm based models. This experiment proposes Long Short Term Memory (LSTM) based neural network model along with two other machine learning models i.e. Support Vector Machine (SVM), K-Nearest Neighbor (KNN), which shows significant improved performance in intrusion detection. The performance of the model is proved to be effective comparing to the previous works and also deployable in real life environments which is validated by using explainable AI. For this experiment, Kyoto University Honeypot log dataset has been used to build and evaluate the performances of the IDS model.

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Carrier Transport and Performance Limit of Semi-Transparent Photovoltaics: Cuin1−Xgaxse2 as A Case Study

Eymana Maria*, Ajanta Saha**, **M. Ryyan Khan*****, Md. Abdullah Zubair*****, Md. Zunaid Baten** and Redwan N. Sajjad******

ABSTRACT

Semi-transparent photovoltaic devices for building integrated applications have the potential to provide simultaneous power generation and natural light penetration. CuIn1−xGaxSe2 has been established as a mature technology for thin-film photovoltaics; however, its potential for Semi-Transparent Photovoltaics (STPV) is yet to be explored. In this paper, we present its carrier transport physics explaining the trend seen in recently published experiments. STPV requires deposition of films of only a few hundred nanometers to make them transparent and manifests several unique properties compared to a conventional thin-film solar cell. Our analysis shows that the short-circuit current, Jsc, is dominated by carriers generated in the depletion region, making it nearly independent of bulk and back-surface recombination. The bulk recombination, which limits the open-circuit voltage Voc, appears to be higher than usual and attributable to numerous grain boundaries. When the absorber layer is reduced below 500 nm, grain size reduces, resulting in more grain boundaries and higher resistance. This produces an inverse relationship between series resistance and absorber thickness. We also present a thickness-dependent model of shunt resistance showing its impact in these ultra-thin devices. For various scenarios of bulk and interface recombinations, shunt and series resistances, AVT, and composition of CuIn1−xGaxSe2, we project the efficiency limit, which—for most practical cases—is found to be ≤10% for AVT≥25%.

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A Review of Next Generation Bifacial Solar Farms: Predictive Modeling of Energy Yield, Economics, and Reliability

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ABSTRACT

Photovoltaic (PV) cell technology has made great progress over the past few decades, bringing the PV energy cost down to a point where it is competitive to conventional electricity prices. While monofacial panels have historically dominated the market, recent developments in the manufacturing of bifacial panels (collecting light from both faces) have made them accessible for commercial applications. It is therefore imperative to define the design principles so that the steeply expanding market of bifacial modules and PV farms stays on an efficient path. In this paper, we will discuss physics-based models for these next-generation bifacial PV farms for analyzing yield and costs. Besides the conventional farm configurations, tracking systems are gaining market shares aiming to enhance the yield at a lower cost. Within $ \pm {30^ \circ }$ latitudes, we predict a 20%-30% energy gain for fixed-tilt bifacial over monofacial modules and an additional 20%–40% gain for single-axis bifacial tracking. Compound systems such as agrophotovoltaics and floating PV applications may be the possible future for a sustainable merger of food-water-energy systems. We show a competing relation between active light collection on crops and energy yield in an agrophotovoltaics system vs panel density—the final design will be decided by the crop yield or light usage efficacy constraint. The output reliability in terms of soiling and module degradation is also explained in this paper. Solar farms are expected to see 2%–5% loss in revenue in Asia and the Middle East even after optimal cleaning. Additionally, the bifacial modules degrade ∼0.5%–0.6%/year. While there have been several physics-based degradation analyses, the bifacial technology lacks a large enough data set of long-term degradation studies for accurate predictions. The combined economics of reliability against yield will decide the viability of the next generation bifacial PV industry.

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Global Analysis of Next-Generation Utility-Scale PV: Tracking Bifacial Solar Farms

M. Tahir Patel*, **M. Sojib Ahmed****, Hassan Imran***, Nauman Z. Butt***, **M. Ryyan Khan******** and Muhammad A.Alam*

ABSTRACT

The bifacial gain of East-West vertical and South-facing optimally-tilted bifacial solar farms are well established. One wonders if bifacial gain and the associated levelized cost of energy (LCOE) may be further improved by tracking the sun. Tracking bifacial photovoltaics (PV) system has advantages of improved temperature sensitivity, enhanced diffuse and albedo light collection, flattened energy-output, and reduced soiling. Monofacial tracking already provides many of these advantages, therefore the relative merits of bifacial tracking are not obvious. In this paper, we use a detailed illumination and temperature-dependent bifacial solar farm model to show that bifacial tracking PV delivers up to 45% energy gain when compared to fixed-tilt bifacial PV near the equator, and ~10% bifacial energy gain over tracking monofacial farm with an albedo of 0.5. An optimum pitch further improves the gain of a tracking bifacial farm. Our results will broaden the scope and understanding of bifacial technology by demonstrating global trends in energy gain for worldwide deployment.

Keywords: Solar Energy Farms, Tracking, Photovoltaics, Bifacial PV, Optimum Design, Utility-Scale PV

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Global Analysis of Optimal Cleaning Cycle and Profit of Soiling Affected Solar Panels

Md. Mahamudul Hasan Mithhu*, **Tahmina Ahmed Rima**** and **M. Ryyan Khan*****

ABSTRACT

The photovoltaics (PV) industry is poised to capture most of the energy sector within the next few decades. As the installed PV capacity increases, even the smallest improvements on the system and operations of the solar farms can accumulate to a significant gain in revenue. One such scope is efficient mitigation of dust accumulation on panels or soiling. While installed capacities are two of the highest in Asia and around US deserts, these locations are also dust prone. The Middle East and North Africa (MENA) regions having good insolation are also highly potential candidates for PV farms with the added complexity of soiling losses. Therefore, while soiling may not be an issue in many locations over the globe, it is in fact relevant to the majority of the PV installation sites. The analysis of the effects of soiling losses on energy yield and economics are of great importance for these locations. In this work, we have extended the empirical soiling model found in the literature to include the effects of temporal variation on soiling and insolation. Our study on variation in revenue with unoptimized cleaning intervals estimates the soiling loss, which can particularly interest PV farms with accessibility issues such as agrophotovoltaic systems. We analyze the optimal cleaning cycle and corresponding normalized revenue (cash inflow normalized to the rated clean farm revenue). A numerical model is used to explain the effects under seasonal and sudden (e.g., sand storm or rain) variations in soiling and insolation. Our closed-form analytical expressions can predict the cleaning cycle and normalized revenue within 0.1% of the numerical results by using the soiling and insolation data averaged over the seasons. Finally, we discuss these results in a global scenario using our estimated world-map for soiling rates. This predicts the worldwide revenue loss under location-specific optimal cleaning cycles, assuming one of the lowest cleaning costs seen globally. In Asia and MENA regions, for example, median revenue loss due to soiling is 2.5% even after optimal cleaning every 5–6 days. This loss is 1.5% in the US for 12 days of cleaning interval. Considering region-specific cleaning costs, the revenue loss of optimally cleaned PV farm is 2%–5% for Asia, MENA, North America, and Europe.

Keywords: Soiling on Solar Panels, Cleaning Cycle, Revenue Profit, Global Soiling Rate

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Analysis of Nuclear-Renewable Hybrid Energy System for Marine Ships

Hossam A.Gabbarab*, Md. IbrahimAdham** and **Muhammad R. Abdussami*****

ABSTRACT

While several actions are being taken to reduce Greenhouse Gas (GHG) emissions from land-based transportation, marine transportations are often unnoticed. Ocean-going marine ships are accounted for a large amount of global GHG emissions. Renewable Energy Sources (RESs) are free from GHG emissions and playing an important role in sustainable development by lessening GHG emissions. Integration of RESs in ocean-going marine ships could be an option to make marine transportation free from emissions. Ocean-going marine ships require a large amount of reliable energy to support the propulsive load demand. RESs are intermittent, and a large amount of energy cannot be stored economically by the available energy storage techniques. Additionally, the penetration of RESs in a marine ship is limited by the available area and total weight carrying capacity of that marine ship. Because of these limitations of RESs in marine ships, there is a requirement of integrating other types of energy sources with RESs to support the baseload energy demand and to avoid the variableness of RESs. Conventional fossil fuel-based generators, like diesel generators, can be incorporated with RESs to overcome these shortcomings of RESs. However, as the penetration of RESs is limited to marine ships, most of the energy is supplied by fossil fuel-based generators. Therefore, the integration of RESs with fossil fuel-based generators merely reduces GHG emissions and is not a feasible option to make marine ships free from emissions. Fossil fuel-based generators need to be replaced by emissions-free and reliable energy sources to make the marine ships free from emissions. Small scale nuclear reactors, such as Small Modular Reactors (SMRs) and Microreactors (MRs), are free from GHG emissions and are competitive candidates to replace fossil fuel-based generators. In this paper, four different energy systems have been analyzed for marine ships namely 'Stand-alone Fossil Fuel-based Energy System', 'Stand-alone Nuclear Energy System', 'Renewable and Fossil Fuel-based Hybrid Energy System' and 'Nuclear-Renewable Hybrid Energy System (N-R HES)' in terms of certain Key Performance Indicators (KPIs). The KPIs include the Cost of Energy (COE), Net Present Cost (NPC), and GHG emissions. The results show that the N-R HES could be the best energy system for the marine industry to reduce GHG emissions and improve economic performance. A sensitivity analysis is also carried out by changing certain parameters to reinforce the findings of this study.

Keywords: Nuclear Power Plant. Renewable Energy, Hybrid Energy Systems, Marine Ships

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Optimal Planning of Integrated Nuclear-Renewable Energy System for Marine Ships Using Artificial Intelligence Algorithm

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ABSTRACT

Ocean-going ships are one of the primary sources of Greenhouse Gas (GHG) emissions. Several actions are being taken to reduce the GHG emissions from maritime vessels, and integration of Renewable Energy Sources (RESs) is one of them. Ocean-going marine ships need a large amount of reliable energy to support the propulsive load. Intermittency is one of the drawbacks of RESs, and penetration of RESs in maritime vessels is limited by the cargo carrying capacity and usable area of that ship. Other types of reliable energy sources need to be incorporated in ships to overcome these shortcomings of RESs. Some researchers proposed to integrate fossil fuel-based generators like diesel generators and renewable energy in marine vessels to reduce GHG emissions. As the penetration of RESs in marine ships is limited, fossil fuel-based generators provide most of the energy. Therefore, renewable and fossil fuel-based hybrid energy systems in maritime vessels can not reduce GHG emissions to the desired level. Fossil fuel-based generators need to be replaced by emissions-free energy sources to make marine ships free from emissions. Nuclear energy is emissions-free energy, and small-scale nuclear reactors like Microreactors (MRs) are competent to replace fossil fuel-based generators. In this paper, the technical, environmental, and economic competitiveness of Nuclear-Renewable Hybrid Energy Systems (N-R HES) in marine ships are assessed. The lifecycle cost of MR, reliability of the proposed system, and limitations of integrating renewable energy in maritime vessels are considered in this study. The proposed N-R HES is compared with three different energy systems, namely 'Standalone Fossil Fuel-based Energy Systems', 'Renewable and Fossil Fuel-based Hybrid Energy Systems', and 'Standalone Nuclear Energy System'. The cost modeling of each energy system is carried out in MATLAB simulator. Each energy system is optimized by using the Differential Evolution Algorithm (DEA), an artificial intelligence algorithm, to find out the optimal configuration of the system components in terms of Net Present Cost (NPC). The results determine that N-R HES has the lowest NPC compared to the other three energy systems. The performance of the DE algorithm is compared with another widely accepted artificial intelligence optimization technique called 'Particle Swarm Optimization (PSO)' to validate the findings of the DE algorithm. The impact of control parameters in the DE algorithm is assessed by employing the Adaptive Differential Evolution (ADE) algorithm. A sensitivity analysis is carried out to assess the impact of different system parameters on this study's findings.

Keywords: Microreactors, Renewable Energy, Hybrid Energy Systems, Ships, Lifecycle Cost, Economic Assessment, Differential Evolution (DE), Sensitivity Analysis

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Review of Battery Management Systems (BMS) Development and Industrial Standards

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ABSTRACT

The evolving global landscape for electrical distribution and use created a need area for energy storage systems (ESS), making them among the fastest growing electrical power system products. A key element in any energy storage system is the capability to monitor, control, and optimize performance of an individual or multiple battery modules in an energy storage system and the ability to control the disconnection of the module(s) from the system in the event of abnormal conditions. This management scheme is known as "battery management system (BMS)", which is one of the essential units in electrical equipment. BMS reacts with external events, as well with as an internal event. It is used to improve the battery performance with proper safety measures within a system. Therefore, a safe BMS is the prerequisite for operating an electrical system. This report analyzes the details of BMS for electric transportation and large-scale (stationary) energy storage. The analysis includes different aspects of BMS covering testing, component, functionalities, topology, operation, architecture, and BMS safety aspects. Additionally, current related standards and codes related to BMS are also reviewed. The report investigates BMS safety aspects, battery technology, regulation needs, and offer recommendations. It further studies current gaps in respect to the safety requirements and performance requirements of BMS by focusing mainly on the electric transportation and stationary application. The report further provides a framework for developing a new standard on BMS, especially on BMS safety and operational risk. In conclusion, four main areas of (1) BMS construction, (2) Operation Parameters, (3) BMS Integration, and (4) Installation for improvement of BMS safety and performance are identified, and detailed recommendations were provided for each area. It is recommended that a technical review of the BMS be performed for transportation electrification and large-scale (stationary) applications. A comprehensive evaluation of the components, architectures, and safety risks applicable to BMS operation is also presented.

Keywords: Energy Storage Safety, Control

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Bangla Text Sentiment Analysis Using Supervised Machine Learning with Extended Lexicon Dictionary

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ABSTRACT

With the proliferation of the Internet's social digital content, sentiment analysis (SA) has gained a wide research interest in natural language processing (NLP). A few significant research has been done in Bangla language domain because of having intricate grammatical structure on text. This paper focuses on SA in the context of Bangla language. Firstly, a specific domain-based categorical weighted lexicon data dictionary (LDD) is developed for analyzing sentiments in Bangla. This LDD is developed by applying the concepts of normalization, tokenization, and stemming to two Bangla datasets available in GitHub repository. Secondly, a novel rule–based algorithm termed as Bangla Text Sentiment Score (BTSC) is developed for detecting sentence polarity. This algorithm considers parts of speech tagger words and special characters to generate a score of a word and thus that of a sentence and a blog. The BTSC algorithm along with the LDD is applied to extract sentiments by generating scores of the two Bangla datasets. Thirdly, two feature matrices are developed by applying term frequency-inverse document frequency (tf-idf) to the two datasets, and by using the corresponding BTSC scores. Next, supervised machine learning classifiers are applied to the feature matrices. Results show that for the case of BiGram feature, support vector machine (SVM) achieves the best classification accuracy of 82.21% indicating the effectiveness of BTSC algorithm in Bangla SA.

Keywords: Sentiment Analysis, Bangla NLP, Tf-Idf; SVM, BTSC, N-Grams, Bi-Grams

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Draft Genome Sequences of Multidrug Resistant Shigella Strains Isolated from Diarrheal Patients in Bangladesh

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ABSTRACT

The emergence of multidrug-resistant (MDR) Shigella strains has impaired the efficacy of first-line antimicrobials and exacerbated diarrhea-associated morbidity and mortality worldwide. We report the draft genome sequences of 11 MDR Shigella strains isolated from the stool specimens of diarrheal patients in Bangladesh.

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A Next Generation Sequencing (NGS) Analysis to Reveal Genomic and Proteomic Mutation Landscapes of SARS-Cov-2 in South Asia

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ABSTRACT

Counts for SARS-CoV-2 associated infections and fatalities are on the rise globally even in regions which contained the spread momentarily. The pattern of infections has been found to be controlled by the distinctive selection pressures exerted by fluctuating environmental nature and hosts. A total of 410 whole-genome sequences submitted by the South Asian countries were retrieved from the GISAID database and analyzed to assess the impact and pattern of mutations in this region. Most common and frequent mutations in the South Asian countries are 241C > T, 3037C > T, 14408C > T, and 23403A > G and about 85% SNPs are localized in ORF1ab, spike protein, and nucleocapsid. Among the identified mutations, the proportion of missense type (54.17%) was highest, followed by the synonymous (41.66%) and the non-coding types (4.17%). While analyzing transmission source in terms of geolocation, the largest clustered group from the South Asian countries was based on the G-clade (D614G) (81.7%; 335/410 samples), tracing the inception and transmission of SARS-CoV-2 infections in the South Asian countries from European regions. Phylogenetic analysis also revealed that the South Asian strains are highly related to the South American and European strains. We found that G-clade mutations are more prevalent (96.19%) in the samples of Bangladesh which were also prevalent in the European isolates. Surprisingly, one missense mutation (1163A > T) in ORF1ab gene became dominant only in Bangladesh (78.8%), which led to debates regarding effects on the pathogenicity and transmissibility of the virus. Overall, the findings of this study highlight the frequently mutated SARS-CoV-2 variants among the COVID-19 patients in the South Asian countries which might ease containment of the disease in this region through investigating the virulence reducing factors as the identified mutations are strongly correlated with low infection and mortality rate.

Keywords: SARS-CoV-2, South Asian Country, Single Nucleotide Polymorphisms, NSP2 Protein, Transmission Linkage

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Factors Affecting the Outcome of the Usage of High-Flow Nasal Cannula on Severe or Critically Ill COVID-19 Patients: A Multicentric Study from a Developing Nation

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ABSTRACT

In resource-constrained settings, High-Flow Nasal Cannula (HFNC) can reduce the burden on mechanical ventilation in COVID-19 induced Acute Hypoxemic Respiratory Failure (AHRF). The aim was to observe the factors those might affect the outcome of the usage of HFNC on severe/critically ill COVID-19 patients. This is a multicentric prospective observational study. We observed rRT-PCR positive severe/critically ill ICU patients requiring HFNC for more than six hours. Statistical analysis was done to correlate between factors and outcome. Weaning from HFNC was successful in 47.5% of patients. The death rate was higher in ≥ 50 years older (56.50%), and patients with asthma (60.57%), COPD (60.00%), and CKD (68.42%). Fever (91.67%), cough (72.5%), and dyspnea (67.5%) were the most common symptoms. Mortality rates were higher for patients with raised blood sugar, creatinine levels. Severely systemic inflammatory response was seen very high for the expired patients. On HFNC, percent saturation of oxygen (SpO2) and partial pressure of oxygen (PaO2) progression was significantly high for the surviving patients requiring less inspired fraction of oxygen (FiO2%). The survival rate was higher for the patients using both HFNC and non-rebreather mask (NRM) concomitantly. While after HFNC- SpO2% and FiO2% were significantly related with outcome of the HFNC only treated patients, duration of hospital stay and on HFNC- FiO2% affected the HFNC + NRM treated patients' outcome. HFNC could save more lives of critically ill AHRF patients who otherwise might need invasive or noninvasive ventilation. Some biochemical tests were observed to have association with the prognosis of the disease though HFNC was given to all. Survival benefit of dual HFNC and NRM therapy needs future study.

Keywords: HFNC, COVID-19, ICU, NRM, SpO2

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Characteristics, Management and Outcomes of Critically Ill COVID-19 Patients Admitted to ICU in Hospitals in Bangladesh: A Retrospective Study

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ABSTRACT

Objectives: This study aimed to analyze the epidemiological and clinical characteristics of COVID-19 cases and investigate risk factors including comorbidities and age in relation with the clinical aftermath of COVID-19 in ICU admitted cases in Bangladesh. Methods: In this retrospective study, epidemiological and clinical characteristics, complications, laboratory results, and clinical management of the patients were studied from data obtained from 168 individuals diagnosed with an advanced prognosis of COVID-19 admitted in two hospitals in Bangladesh. Results: Individuals in the study sample contracted COVID-19 through community transmission. 56.5% (n = 95) cases died in intensive care units (ICU) during the study period. The median age was 56 years and 79.2% (n = 134) were male. Typical clinical manifestation included Acute respiratory distress syndrome (ARDS) related complications (79.2%), fever (54.2%) and cough (25.6%) while diabetes mellitus (52.4%), hypertension (41.1%) and heart diseases (16.7%) were the conventional comorbidities. Clinical outcomes were detrimental due to comorbidities rather than age and comorbid individuals over 50 were at more risk. In the sample, oxygen saturation was low (< 95% SpO2) in 135 patients (80.4%) and 158 (93.4%) patients received supplemental oxygen. Identical biochemical parameters were found in both deceased and surviving cases. Administration of antiviral drug Remdesivir and the glucocorticoid, Dexamethasone increased the proportion of surviving patients slightly. Conclusions: Susceptibility to developing critical illness due to COVID-19 was found more in comorbid males. These atypical patients require more clinical attention from the prospect of controlling mortality rate in Bangladesh.

Keywords: Bangladesh, COVID-19, Critical Care, Epidemiology, Clinical Characteristics, Comorbidities, Managements

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Robust Normality Test in the Presence of Outliers

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ABSTRACT

In classical statistics, detecting the normality of the data is one of the essential assumptions. However, if the selected random samples have some outliers, this assumption is violated. It is now evident that the Jarque-Bera (JB) test is one of the most powerful tests of normality. The study shows that in the presence of outliers, the JB test does not perform well in many situations. Thus, they proposed a robust Jarque-Bera (RJB) test as an alternative. In this article, we incorporate the idea of Gel and Gastwirth and proposed also a modified Jarque-Bera (MJB) test which has more power than the RJB. The results of the real-life example and simulation study shows that the power of MJB is higher in detecting normality of data compared to the JB and RJB test

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Formulation of Rice Based Low Cost Balanced, Nutritious and Safe Diet for the Malnourished Street Children in Capital City Dhaka

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ABSTRACT

A total of 384 street children were subjected to study a baseline survey aged from 4 to 12 years old in Capital City, Dhaka. The sample size was fixed by addressing Cochran equation. Among the respondents 63% were male and 37% were female from street children population of 384. Survey took place at 20 different hot spots covering both Dhaka city north and south. We have observed the recommended dietary intake per day from 4 years to 12 years old male boys and found 27 to 59% deficiency in our male population samples of 243. Similarly, we also observed the recommended dietary intake per day from 4 years to 12 years old female girls and found 28 to 56% deficiency in our female population samples of 141. Since our Energy Dense Rice Cake (EDRC) has a potential of providing 500 kcal energy per 100g serving so, we could predict that incorporating our improved rice-based product once a day along with their daily regular intake, it will be able to mitigate nutritional gap by 64 to 100% for street boys and noticeably 70 to 100% for girls. We have prepared Energy Dense Rice Biscuit (EDRB, 3.6% moisture, 515 kcal per 100g of serving) and EDRC (5.0% moisture, 500 kcal per 100g of serving). EDRC was found prepared than EDRB in impact study when the respondents were given choice of rice-based bakery items intake for four months long period. Finally, a total of 32 respondents were took part in a four months period impact study on EDRC from street children population. All anthropometric and biochemical data such as CBC (Complete Blood Count), Hemoglobin, CRP, Prealbumin etc. were collected at both the starting (Day 0) and the end time (Day 120) of the impact survey of selected 32 respondents. Respondents were given 100g serving of EDRC every day (rice cake) to 32 street children samples for 4 months period along with their normal food intake. Our data revealed that malnutrition related parameters specially CRP (decreased) and Prealbumin (Increased) are significantly improved for four months supplementary intake of extra 500 kcal per 100 g serving of EDRC in tested street children's samples which resembles the possible impact of EDRC on street children. Rice-based bakery products specially EDRB and EDRC can potentially be used in school feeding nutritional program and disaster management in Bangladesh.

Keywords: Energy Dense Rice Biscuit, Impact Study, Baseline Survey, Prealbumin, Formulated Food

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Gel Point Determination of Gellan Biopolymer Gel from DC Electrical Conductivity

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ABSTRACT

Gellan is an anionic bacterial polysaccharide, which in aqueous solution dissociates into a charged gellan polymer molecule containing carboxyl ions and counter ions and forms thermoreversible gel under appropriate conditions. In this study, we investigated the effect of polymer concentration, the concentration of added monovalent metallic ion, and temperature on the DC electrical conductivity of the gellan. Results suggest that the DC conductivity decreases with the increasing polymer concentrations and the added monovalent metallic ions. Such a decrease in DC conductivity can be attributed to the reduction of the mobility of counter ions due to the increase in the crosslinking density of the gellan network. DC conductivity of gellan gels was increased with temperature, which is interpreted as the dissolution of physically cross-linked networks, thus increasing the mobility of counter ions. The behavior of temperature variation of DC electrical conductivity reveals an abrupt change at a specific temperature, which can be considered a way to determine the gel point or sol–gel transition temperature T c of this thermoreversible biopolymer gel. This result agrees with that of rheological measurements where the viscosity showed a similar trend with temperature and diverges to infinity at the temperature close to T c.

Keywords: Gellan Gum, Biopolymer Gel, Sol–Gel Transition, DC Conductivity, Monovalent Ions

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Nonlinear Propagation of Dust-Acoustic Waves in An Unmagnetized Collisional Dusty Plasma with Both Nonthermal Electron and Ion Distribution for Damped Korteweg-De Vries Equation

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ABSTRACT

The nonlinear propagation of dust-acoustic (DA) waves in an unmagnetized dusty plasma consisting of nonthermal electrons, vortex-like (trapped) distributed ions and mobile negative dust have been investigated by employing the reductive perturbation technique. The effects of nonthermal electrons and trapped ions are found to modify the properties of the DA solitary waves

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Dilaton-Axion Black Hole under the Solar System Tests

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ABSTRACT

In the present paper we study the static and spherically symmetric dilaton-axion black hole in the testing ground of the Solar system. We constrain the parameters of the string motivated dilaton-axion form of the classical tests of general relativity, viz., the perihelion precession of the planet Mercury and the deflection of light by the Sun. In this case we have two free parameters: the dilaton strength and the point of curvature singularity of black hole. We obtain the permissible range of these two parameters from theoretical analysis based on the model and later compare them with the observations.

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An Overtime Production Inventory Model for Deteriorating Items with Nonlinear Price and Stock Dependent Demand

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ABSTRACT

The goal of this work is to discuss a production inventory model for deteriorating items with nonlinear price and linear stock dependent market demand along with an overtime production opportunity. The corresponding optimization problem is articulated mathematically and hence solved by using lingo software. To examine the proposed nonlinear optimization problem's significance, one numerical example is deliberated. A sensitivity analysis is accomplished on the basis of the systematic changes of the system parameters. As a final point, based on the accomplished analysis an effectual conclusion is reflected.

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New Solitonic and Rogue Wave Solutions of Klein-Gordon Equation using Quadratic Nonlinearity

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ABSTRACT

An analytical investigation has been performed on soliton and linked rogue wave in the Klein-Gordon through the extended tanh approaches, which possess complicated wave propagation arises in the field of nonlinear optics, theory of quantum field and solid state physics. As a result, advanced form of interacting analytical solutions has been achieved with some unrestricted parameters. Different conditions on the existing parameters of these solutions are found after analyzed its dynamic behavior. Based on the conditions, different type of rogue wave, bright bell and dark bell shape nature of the solutions are considered. The dynamics nonlinear wave solutions are demonstrated in 3-D plots with specific values of the existing parameters. Moreover, it is shown that nonlinear wave packets are localized in two dimensions with characteristics rogue wave profiles.

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Numerical Analysis of Thermofluids Inside a Porous Enclosure with Partially Active Thermal Wall

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ABSTRACT

In this study, heat transfer in a tall, rectangular permeable cavity with active thermal walls is investigated. Inside the enclosure, the two side walls' central portions are partially cooled at a fixed temperature. The cen- tral portion of the footwall is heated. Additionally, the top wall, the remaining portion of the footwall, and the side walls are insulated. The controlling equations are obtained from the Brinkman—Forchheimer- extended Darcy prototypical model using Boussinesq calculations. The leading equations are explained numerically by the finite element Galerkin method of weighted residuals. The computations are executed for some governing and physical parameters. The isotherms, streamlines and average heat transfer rate along with the partially active hot wall are shown for different groupings of governing parameters with respect to dimensionless time (t). The outcomes indicated that the stream and thermal fields are strongly dependent on the considered parameters. It is also established that the average heat transfer rate is a function of these governing parameters.

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Simulation of Tsunami along North Sumatra and Peninsular Malaysia allied with the Indonesian Tsunami of 2004 using a Shallow Water Model

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ABSTRACT

The linear polar coordinate shallow water model of Ismail et al. (2006) is used to simulate Tsunami effect along North Sumatra and Penang Islands allied with Indonesian tsunami of 2004. The study of Ismail et al (2006) was based on the assumption that the primary displacement of the water surface at the source zone in the form of sea level rise and fall is equal to the stationary move of the sea floor deformation in the rupture region, which is not completely precise. The dynamics of seafloor displacement over a short period of time was ignored in that study. The major factor, which determines the initial amount of a tsunami, is the amount of vertical sea floor deformation (Iguchi, 2011). The properties of Indonesian tsunami 2004 are related to the scale of the bottom displacement (Kowalik et al. 2005). In this paper, a reassessment of the initial tsunami source of 2004 Indonesian tsunami taking the amount of vertical sea floor deformation and the dynamics of seafloor displacement over a short period is considered as the initial condition of tsunami generation. The computed maximum water levels along the coastal belts of Sumatra and Penang in Peninsular Malaysia compare well with the observed water level data obtained through post tsunami surveys. The results of this study suggest that a linear cylindrical polar coordinate shallow water model can be applied to simulate different aspects of tsunami.

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Heavy Metals Contamination of River Water and Sediments in the Mangrove Forest Ecosystems in Bangladesh: A Consequence of Oil Spill Incident

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ABSTRACT

Oil spillage is one of the common pollution events of global water-soil ecosystems. A comprehensive investigation on heavy metals pollution of surface water and sediments was conducted after oil spill incident in Sela River and its tributaries of the Sundarbans mangrove forest ecosystems, Bangladesh. Water and sediment samples were collected from the preselected sampling points in Sela River, and the elemental (Pb, Cd, Cr, Co, Cu, Ni, Fe, As, Hg, Mn, Zn, Ca, Mg, Na, and K) analysis was done using atomic absorption spectrometer (AAS). This study revealed that the descending order for the average concentration of the studied elements were found to be Mg > Co > Na > Ni > K > Ca > Pb > Fe > Mn > Cr > Cd > Zn > Cu respectively, while As and Hg in water samples were found to be below detection limit (BDL). However, some of the toxic elements in the Sela River water samples were exceeded the permissible limit set by the World Health Organization (WHO) with a descending order of Co > Cd > Pb > Ni respectively. Based on the water quality index (WQI), metal pollution index (MPI), and metal quality index (MI), the Sela River water is not suitable for drinking but may be used for irrigating agricultural and vegetable crops. On the other hand, elemental concentration in the sediment samples were found to be the following descending order of Fe > Mg > Na > K > Ca > Mn > Zn > Cr > Cu > Pb > As > Cd respectively. Several pollution assessment indices: contamination factor (Cf), degree of contamination (Cd), modified degree of contamination (mCd), pollution load (PLI), enrichment factor (EF), geo-accumulation (Igeo) indices were followed to assess the sediment systems pollution in the study area. Considering sediment quality indices, this study revealed that the river sediment had higher contamination factor (Cf) values for Cd, moderate values for Pb, Cr, Cu, Zn, Mg, and As, and low values for Mn, Fe, Ca, Na, and K. Among the studied heavy metals, Cd content was highest in both water and sediment samples, which confirming that Cd, insoluble or suspended form, was more likely to be strongly deposited and bound in sediments from water. Principal component and correlation analyses suggested that the sources of heavy metals pollution were mainly anthropogenic along with the geogenic sources in the study area.

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Heavy Metal Pollution in the Soil-Vegetable System of Tannery Estate

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ABSTRACT

The heavy metal toxicity has the connection with the numerous deadly diseases in human body that includes but is not limited to the diseases related to DNA damage, cancer, hemolysis, gastrointestinal hemorrhage, and pulmonary edema. The metals, Cr, Cu, Ni, Cd and Pb, widely used in the Tannery industries have the potential to show similar toxicity. Therefore, we studied the environmental pollution caused by a recently relocated Hemayetpur Tannery Estate, Dhaka, Bangladesh. A comparative study has been carried out between Tannery Estate soil and nearby non-industrial agricultural area soil. To accomplish this study, laboratory based analytical tools to statistical analysis were used for the assessment of extent of pollution and its health risks indices. The results revealed that the Tannery Estate soil and vegetables contain a very high concentration of heavy metals (20.15, 19.67, 12.93, 10573.02 and 4.02 mg/kg in soil; 18.13, 12.17, 7.63, 201.63 and 1.60 for B. alba; 15.67, 9.87, 8.03, 16.00 and 1.20 for A. gangeticus of Ni, Pb, Cu, Cr and Cd, respectively) compared to the samples collected from non-industrial agricultural area. The order of all the studied metals posing cancer risk is Cr > Pb > Ni > Cd and non-cancer risks is Pb > Cd > Ni > Cu > Cr which were supported by the statistical analysis (ANOVA, PEARSON Correlation and Principal Component Analysis). The tanning agents and inefficient treatment of the effluent could play the crucial role to contaminate the soil-vegetable system in the Tannery Estate areas. Therefore, this study indicates that the metals pollution in soils can be minimized by translocating the studied metals in non-edible plants (as of Plant Transfer Factors) followed by effective and careful monitoring of the disposal of solid and liquid wastes during the processing of leather and leather products after appropriate treatments.

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Application of Laser-Desorption Silver-Ionization Ultrahigh-Resolution Mass Spectrometry for Analysis of Petroleum Samples Subjected to Hydrotreating

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ABSTRACT

In this study, silver ion (Ag+)-aided laser-desorption ionization coupled to Fourier transform ion cyclotron resonance mass spectrometry was applied to investigate the effects on sulfur-containing compounds after the hydrodesulphurization (HDS) process. For this purpose, three sets of atmospheric residue (AR) and treated atmospheric residue (tAR) samples were analyzed by adding silver nitrate (AgNO3) solution at an optimized concentration ratio of 1:1. Two high-sulfur samples (5.51 and 4.68% each) and one low-sulfur (0.47%) AR sample were studied. The results presented in this study showed that significant changes in the sulfur (S1 and S2) and hydrocarbon (HC) class were observed after treatment of the high-sulfur AR samples. The removal of S1 species with lower double-bond equivalent values (DBE) (DBE < 9), presumably thiophenes and benzothiophenes, was more effective than the removal of S1 species with higher DBE (DBE > 9) values. In addition, the abundance of the aromatic HC class was significantly increased, but the abundance of the nonaromatic HC class was not. In the case of a low-sulfur AR sample, no significant change in HC class was observed after treatment. Therefore, it was concluded that the transformation of benzo- and dibenzothiophene-type compounds to aromatic HCs is the major reaction occurring in the HDS process. The reaction pathways for the transformation were suggested based on the results obtained in this study and previous literature. This study confirms that laser-desorption silver ionization can efficiently ionize the hydrocarbons and nonpolar sulfur-containing compounds present in crude oil.

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Comparison of Filter Banks of DWT in Recovery of Image using One Dimensional Signal Vector

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ABSTRACT

Digital filter bank of DWT (discrete wavelet transform) provides the approximate and detail components of a signal, whereas the perfection of the filter bank depends on recovery of the signal. In this paper, we convert an image into a one dimensional signal vector then the perfection of the filter bank is observed on recovery of signal vector hence the image. Here orthogonal FIR (finite impulse response), FIR under window method, IIR (infinite impulse response) Butterworth, Chebyshev type-I, type-II and synchrosqueezed transform are compared in context of image recovery under statistical parameters: mean error, variance of error, difference of skewness and kurtosis, cross-correlation coefficient, PSNR (peak signal to noise ratio) and histogram. The orthogonal FIR combination gives the best results and synchrosqueezed transform is the worst case for reconstruction of image.

Keywords: FIR Filter, Phase Error Of DWT, Mean Error, Butterworth Filter, Chebyshev Type-I And Type-II Filter

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Ethanolic Extract of Coccinia Grandis Prevented Glucose Intolerance, Hyperlipidemia and Oxidative Stress in High Fat Diet Fed Rats

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ABSTRACT

Background-Coccinia grandis (L.) Voigt (Cucurbitaceae) is well known as ivy gourd/little gourd in English, found to be beneficial in the management of diabetes. Purpose-This project was conducted to evaluate the beneficial effects of chemically characterized C. grandis ethanol extract in high fat (HF) diet fed rats. Methods-Antidiabetic test was performed by oral glucose tolerance test, antioxidant evaluation was done by the assessment of the antioxidants, anti-oxidant enzyme activity as well as liver marker enzymes activities in the plasma and tissues collected from the rats. Cholesterol level was also quantified in rats used in different groups. To monitor the fibrosis in the liver and infiltration of inflammatory cells, histological staining was performed. Results-C. grandis treatment significantly reduced cholesterol level, liver wet weight and peritoneal as well as epididymal fat accumulation in HF diet fed rats. Furthermore, C. grandis treatment significantly prevented the rise of liver enzymes and MPO activities in rats fed with HF diet. C. grandis treatment also successfully restored the activities of antioxidant enzymes in rats fed with HF diet. The outcomes for antioxidant potential specify that at both doses of C. grandis extracts (100 and 200 mg/kg) significantly prevented the oxidative stress parameters which are comparable to the standard metformin. Moreover, ethanolic extracts of C. grandis prevented inflammation or fibrosis in liver of HF diet fed rats. HPLC-DAD analysis of the extract identified and quantified significant number of phenolic compounds such as gallic acid, kaempferol and quercetin hydrate. Conclusion-This study suggests that, ethanolic extract of C. grandis can prevent fat deposition, hyperlipidemia, glucose intolerance and oxidative stress in rats fed with HF diet.

Keywords: C. grandis, Glucose Intolerance, Dyslipidemia, Obesity, Inflammation, Fibrosis

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Association between Insomnia and Mucormycosis Fear Among the Bangladeshi Healthcare Workers: A Cross-Sectional Study

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ABSTRACT

Background- The emergence of mucormycosis cases amid the COVID-19 pandemic; fear associated with mucormycosis may turn out to be a terrifying public health issue. This study aimed to assess the association between fear and insomnia status and other predictors of mucormycosis among Bangladeshi healthcare workers. Methods- From May 25, 2021 to June 5, 2021, a cross-sectional study was carried out among healthcare workers. A total of 422 healthcare workers participated in this study. A semi-structured online questionnaire was used for data collection during the COVID-19 pandemic, followed by convenient and snowball sampling methods. A multivariable linear regression model was fitted to assess the association between fear and insomnia status and other predictors of mucormycosis. Results- The results indicated that the respondents with insomnia status had a higher score of mucormycosis fear than not having insomnia, significantly ($\beta = 3.91$, 95% CI: 2.49, 5.33, $p < 0.001$). Alongside, with the increase knowledge score of mucormycosis, the average fear score increased, significantly ($\beta = 0.35$, 95% CI: 0.20, 0.50, $p < 0.001$). The gender, profession, and death of friends and family members due to COVID-19 significantly affected mucormycosis fear increment. Conclusion- This is the first study that focused on assessing the association between mucormycosis fear and insomnia status among the healthcare workers so far. The study findings recommend emphasizing on the mental health aspects and ensuring support to the healthcare workers so that they can tackle the ongoing public health crisis smoothly.

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Clinical Features of Pneumonia in Severely Malnourished Children with Diarrhoea Compared to those without Diarrhoea

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ABSTRACT

Introduction: Pneumonia and diarrhoea are amongst the most common causes for hospital admission for children in low- and middle-income countries such as Bangladesh. Undernourished children often have more severe infections and a higher morbidity and mortality. Objective: The objective of this study was to determine the clinical features and outcomes of pneumonia in severely malnourished children with and without diarrhoea. Methodology: A retrospective chart analysis was carried out on children under 5 years of age who were admitted in intensive care unit of the Dhaka hospital of International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b). A total of 245 severe acute malnourished children with pneumonia and diarrhoea (PD group) were compared with 89 children with pneumonia only (PO group). Results: A significantly higher number of children from the PD group had some/severe dehydration (16.3% vs. 1.1%; $p < 0.005$) when compared with children from the PO group. The PD group showed less cough (83.3% vs. 100%; $p < 0.001$), lower chest wall indrawing (40.4% vs. 60.7%; $p = 0.001$), and crackles (62.4% vs. 87.6%; $p < 0.001$) compared to the PO group at the time of admission. Conclusion: Early diagnosis and treatment of some/severe dehydration in addition to WHO recommended other routine treatment of diarrhoea, pneumonia and severe acute malnutrition in children may help to reduce childhood morbidity and mortality especially in low- and middle-income countries.

Keywords: Bangladesh, Children, Diarrhoea, Malnutrition, Pneumonia

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Sensitivity Patterns of Bacterial Pathogens Isolated from Blood Cultures of Under-Five Children with Pneumonia and Clinical Sepsis

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ABSTRACT

Treatment options for pneumonia and sepsis by antibiotics are limited due to the development of multidrug-resistant bacterial strains. This unmatched case-control study determined the antibiotic sensitivity against bacterial isolates obtained from septic and nonseptic children with pneumonia. Children of either sex aged 0–59 months with a history of cough or shortness of breath and radiologically confirmed pneumonia were enrolled in this study. Cases with clinical signs of sepsis at admission (n = 151) were compared to cases without sepsis as controls (n = 107). A total of 205 children had a performance of blood culture, with 123 children suffering from clinical sepsis. Blood cultures showed bacterial growth in 19% of the septic samples, with 8% coagulase-negative staphylococci and 2.4% Acinetobacter species. Only 1.6% of the cases were infected by Streptococcus pneumonia, Haemophilus influenzae, Salmonella typhi and Klebsiella. In contrast, children without sepsis presented positive blood cultures with growth of Salmonella typhi in 2.4% of the cases and growth of Klebsiella in 1.2%. Bacteria were sensitive to imipenem in 100% of the cases (86% for meropenem, 83% for ceftazidime and 76% for ciprofloxacin). The mortality rate was significantly higher in children with pneumonia complicated by sepsis (odds ratio (OR) = 3.02, 95% confidence interval (CI), 1.11–8.64, $p < 0.027$). Knowledge about specific laboratory characteristics in children with pneumonia will facilitate an early diagnosis and treatment of sepsis and reduce mortality. Keywords: bacterial resistance, children, mortality, pneumonia, sepsis.

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In vitro Assessment of Acetylcholinesterase Inhibitory Activity using Combination of Synthetic Drugs

Rafid Hasan Dipto, Akhi Alal, Sagor Roy, Ahmed Mostafiz Rufsun Zani, **Kushal Biswas*** and **Sufia Islam****

ABSTRACT

Cholinesterase inhibitors (Donepezil) and N-methyl D-aspartate (NMDA) receptor antagonists (Memantine) are the most widespread medication that use to control Alzheimer's disease. Donepezil suppresses the activity of acetylcholinesterase (AchE) that increases the activity of acetylcholine, which leads to improved cognitive function. In addition to that, NMDA receptor antagonists control glutamatergic receptors of the neurons, which are involved in synaptic plasticity, neuronal growth, and neuronal differentiation. By doing so, it enhances patients' cognition, learning, and memory. In this study, Donepezil and Memantine are used in combination to observe acetylcholinesterase inhibitory activity compared to Donepezil monotherapy. Modified Ellman's method was incorporated in this experiment to determine the activity of these medications. The maximum inhibitory activity is obtained 92.59% for Donepezil, a dose of 100 µg/ml. A maximum of 71.25% inhibition is accepted in combination therapy (Donepezil: 75 µg + Memantine: 25 µg) of the total 100 µg/ml dose. It is the first study where we used Memantine in combination with Donepezil to observe the acetylcholinesterase inhibitory effect. Further studies at different doses will help to establish whether combinations of these drugs are beneficial for the patients or not.

Keywords: Acetylcholinesterase inhibitor, Donepezil, Memantine, Combination Therapy

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Le Carbone Prevents Liver Damage in Non-Alcoholic Steatohepatitis-Hepatocellular Carcinoma Mouse Model Via Ampkα-SIRT1 Signaling Pathway Activation

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ABSTRACT

Le Carbone (LC), a fiber-enriched activated charcoal dietary supplement, claimed to be effective against inflammation associated with colitis, trimethylaminuria, and sclerosis. The study aimed to investigate the underlying mechanisms of LC to protect liver damage and its progression in non-alcoholic steatohepatitis-hepatocellular carcinoma (NASH-HCC) mice. To induce this model, C57BL/6J male baby mice were injected with a low-dose of streptozotocin and fed with a high-fat diet (HFD) 32 during 4 weeks–16 weeks of age. The LC suspension was administered orally at a dose of 5 mg/mouse/day started at the age of 6 weeks and continued until 16 weeks of age along with HFD32 feeding. At the end of the experiment, serum and liver tissues were collected for the biochemical, histological, and molecular analysis. We found that LC suspension improved the histopathological changes, serum aminotransferases in NASH mice. The hepatic expression of metabolic proteins, p-AMPKα and sirtuin 1, and proteins responsible for β-oxidation of fatty acids, peroxisome proliferator-activated receptor (PPAR) γ coactivator-α, PPARα were significantly repressed in NASH mice. LC treatment markedly restored these expressions. LC treatment significantly reduced the hepatic proteins expressions of PPARγ, tissue inhibitor of metalloproteinases 4, p47phox, p-JNK, p-ERK1/2, glypican-3, and prothrombin in NASH mice. Our findings demonstrate that LC prevents the liver damage and progression of NASH, possibly by enhancing the AMPK-SIRT1 signaling pathway.

Keywords: Ampkα, Le Carbone, Non-Alcoholic, Steatohepatitis, Pparα, Sirt1

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Acetylcholinesterase Inhibitory and Antioxidant Activity of the Compounds Isolated from Vanda roxburghii

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ABSTRACT

Vanda roxburghii has been used in traditional medicine to treat nervous system disorders including Alzheimer's disease (AD). We reported earlier a high acetylcholinesterase inhibitory and antioxidant activity in the chloroform fraction of this plant. Therefore, this study was designed to explore the compounds with acetylcholinesterase inhibitory and antioxidant activities from the chloroform fraction of Vanda roxburghii. Phytochemical investigation led to the isolation for the first time of a fatty acid ester: methyl linoleate (1), and three phenolics: syringaldehyde (2), vanillin (3), and dihydroconiferyl dihydro-p-coumarate (4) along with the previously reported compound gigantol (5). Among the isolates, vanillin (3) and dihydroconiferyl dihydro-p-coumarate (4) were found to significantly inhibit the activity of acetylcholinesterase, scavenge the free radicals, exhibit the reducing power and total antioxidant activity, and effectively reduce the peroxidation of lipid. Gigantol (5) and syringaldehyde (2), despite lacking the activity against acetylcholinesterase, exhibited antioxidant activity. Among the compounds, gigantol (5) appeared to be the most potent antioxidant. These findings revealed that V. roxburghii contained compounds with potential acetylcholinesterase inhibitory and antioxidant activity, which support its traditional use in the treatment of AD.

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Solvent Contribution to Ferrocene Conformation: Theory and Experiment

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ABSTRACT

Solvent impacts on ferrocene configuration and the nature of its component energies. The measured infrared (IR) spectra of ferrocene (Fc) in the region 400-500 cm−1 exhibit very different profiles in gas phase and in solutions. The present study further explores such the differences in gas phase and in solutions using combined theoretical calculations and experimental measurements. It concentrates on the IR spectra in the region of 400–1200 cm−1 using non-polar (tetrachloromethane (CCl4) and n-hexane (Hex)) and polar (acetonitrile (ACN), dichloromethane (DCM), tetrahydrofuran (THF) and 1,4-dioxane (DOX)) solvents. Six relatively intense normal modes in this region (ν7, ν8,9, ν18, ν22,23, ν30,31 and ν37 at approximately 482, 495, 815, 840, 1006, 1110 cm−1) were obtained. The dependence of the relative energies of the eclipsed and staggered rotamers of Fc on the polarity of the solvent is small. Analysis of the band profile for the vibrational modes in the 480-500 cm−1 region (ν7, ν8,9) using the reaction coordinate model suggests that the energy difference between the eclipsed and staggered rotamers (ΔEe-s solv) may be underestimated by implicit solvent model in the calculations. Further investigation in this direction is warranted. The impact of solvation on Fc configuration is further investigated using energy decomposition analysis (EDA) in a non-polar (tetrachloromethane (CCl4)) and a polar (acetonitrile (ACN)) solvent. These calculations suggest that solvation substantially changes the electrostatic and quantum mechanical Pauli energy contributions to the interaction energy of Fc conformers, which result in a large steric energy in solvents to enhance the dominance of the eclipsed Fc, an observation consistent with the analysis of the bands due to the ν7 and ν8,9 vibrational modes.

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Prescription Patterns for Empagliflozin among Adults with Diabetes Mellitus in Dhaka, Bangladesh

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ABSTRACT

Objective: To evaluate the prescribing pattern of empagliflozin with respect to other concomitant prescribed drugs in a diabetic patient. Methods: The present research study was conducted in Dhaka from May 2021 to July 2021 at National Healthcare Network (NHN), Dhaka (Jurain, Uttara and Mirpur Branch). A total of 139 were included in this study by following a simple random procedure. Results: According to the research criterion, 198 prescriptions were collected and 139 were assessed for the study. 78 (56.12%) were male and 72 (51.8%) belonged to the age group 30-64 years, and 67 (48.2%) were in the age group of 65-79 years. 57 (41%) had normal weight, followed by 33 (23.74%) who were overweight, and 49 (35.25%) patients were obese. Approximately 73 (52.52%) of prescriptions prescribed empagliflozin alone, whereas 76 (54.68%) of prescriptions prescribed the combination of empagliflozin and metformin. Among 202 co-prescribed anti-diabetic preparations other than empagliflozin (either monotherapy or combination therapy), 142 (70.30%) were oral hypoglycemic and 60 (29.70%) were insulin preparations. Apart from anti-diabetics, 396 medications were prescribed in this study, including anti-hypertensives (n=47;11.87%) and lipidlowering drugs (n=43;10.86%). The number of protein pump inhibitors (PPIs) and nutritional supplements were 106 (26.77%) and 84 (21.21%) prescriptions respectively. Conclusion: Empagliflozin is one of the most often recommended anti-diabetic medications in Bangladesh to treat diabetes with or without cardiovascular and obesity-related complications. Other drug classes are prescribed as well, with no apparent contradictions.

Keywords: Empagliflozin, Anti-Diabetic Agents, Diabetes Mellitus, Prescription Pattern

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Pro12Ala polymorphism in PPAR-γ gene of impaired glucose tolerance subjects in Bangladeshi population

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ABSTRACT

Pro12Ala polymorphism in PPAR-gamma (PPAR-γ) gene is associated obesity and hyperglycemia in some races, but controversy exists for other races. In this study, 113 impaired glucose tolerance (IGT) and 113 healthy control subjects were recruited. Wild type (CC), heterozygous (CG), and homozygous (GG) variants of Pro16Ala polymorphism of PPAR-γ (rs1801282) were analyzed using Chi-square test, and the polymorphism was found significantly (p=0.05, X2=5.875) associated with IGT subjects. Allele frequency also shows significant association with IGT subjects in the Chi-square test (p=0.026, X2=2.248). When the waist-hip ratio was reanalyzed according to genotype variation, the waist-hip ratio was found significantly higher among subjects with heterozygous and homozygous variants of pro16Ala polymorphism. Therefore, our study concluded that PPAR-γ P12A variants might be associated with impaired glucose tolerance. It is also documented that higher waist to hip ratio in IGT subjects may associate with heterozygous (CG) and homozygous (GG) variants of Pro12Ala mutation in the PPAR-γ gene.

Keywords: PPAR-γ gene polymorphism, Impaired glucose tolerance, Lipid profile

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Phytochemical Analysis, Antioxidant and Cytotoxic Activities of Mucuna pruriens Leaves

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ABSTRACT

Mucuna pruriens is a tropical legume native to Africa, India and Bangladesh and is widely cultivated in tropical countries. In this study, a crude methanolic extract of the leaves of M. pruriens was investigated for its chemical constituents and to explore the phenolic and flavonoid content, antioxidant, cytotoxic and antimicrobial activities using established protocols. From the ethyl acetate soluble fraction of the crude methanol extract, three known compounds namely ferulic acid (1), 2-(5-methoxy-1-benzofuran-3-yl)-N-ethylethanamine (2) and stizolamine (3) were isolated and their structures were elucidated by the analysis of NMR spectral data. The crude extract was found to possess phenolic content of 216.16 µg/g whereas the concentration of flavonoid was found to 214.8 µg/g expressed in quercetin standard. Free radicals generated through DPPH were neutralized by crude methanolic extract and the IC50 value was obtained as 19.63 µg/ml. Regression analysis during brine shrimp lethality test enumerated LC50 value of crude methanolic extract at 10.72 µg/ml and was significant compared to the positive standard. The crude methanolic extract of leaf of M. pruriens did not show any significant antimicrobial activity against the organisms used in our test.

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K-Cosine-Medoids Clustering Algorithm

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ABSTRACT

Clustering is a data mining method that aims to partition data into multiple clusters by minimizing inter-cluster similarity and maximizing intra-cluster similarity. K-medoids is one of the most simple and well-known clustering algorithms. However, due to the presence of local outliers and randomly selecting initial medoids, the performance of the algorithm sometimes deteriorates. In this paper, we propose K-cosine-medoids algorithm that extends the idea of K-medoids algorithm and works on minimizing the aforementioned shortcomings. By implementing a systematic approach of selecting initial medoids similar to K-means++ algorithm and using cosine similarity for assigning data points to different clusters and updating medoids, we have observed a significant improvement in terms of accuracy compared to the standard K-medoids algorithm and a number of its variants.

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K-Cosine-Means Clustering Algorithm

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ABSTRACT

K-means algorithm is a clustering algorithm that is one of the most widely used unsupervised techniques in data mining. This paper presents an extension of K-means algorithms named K-cosine-means algorithm. While the K-means algorithm initializes the centroids randomly and uses the Euclidean distance measure to assign data points to clusters, our proposed algorithm inherits a systematic approach from K-means++ to initialize the centroids and utilizes Cosine similarity to assign data points to clusters. We have performed experiments on both homogeneous datasets (Iris and Seeds datasets) and heterogeneous dataset (Hepatitis dataset). From experimental results, we have observed better clustering accuracy on homogeneous datasets compared to other variants of the K-means algorithm, namely, K-means, IK-means, K-means++, WK-means, MWK-means, iWK-means, and iMWK-means. However, for heterogeneous dataset, we have observed better clustering accuracy compared to standard Kmeans, K-means++, and iK-means algorithms.

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An Improved Diabetic Retinopathy Image Classification by Using Deep Learning Models

Jannatul Naim; Zahid Hasan, Md. Niajul Haque Pradhan and **Shamim Ripon***

ABSTRACT

Diabetic Retinopathy (DR) is a kind of diabetes complication that damages the light-sensitive tissues of the blood vessels at the back of the eyes. Early detection of such problems along with controlling diabetes can prevent severe damages from the disease. Detection of DR is time-consuming, and manual detection is error-prone. Hence, in the majority of the cases, it is detected at a severe stage making it difficult to treat properly. To handle this problem, this paper presents a deep learning model consisting of AlexNet, VGGNet, and modified VGGNet, and ResNet, to detect DR from images. A detailed comparison among the adopted models and the state-of-the-art reveals that the modified VGGNet outperforms other applied models with 87.69% accuracy, 87.93% precision, and 87.81% recall. The model accuracy increases to 95.77% after performing hyperparameter tuning. The experimental results are promising and make the model a suitable candidate for automated DR detection from fundus images.

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A Deep Convolutional Generative Adversarial Network Based Model to Analyze Histopathological Breast Cancer Images

Tanzina Tani, Mir Moynuddin Ahmed Shibly and **Shamim Ripon***

ABSTRACT

Breast cancer is one of the severe cancers, and early detection is needed to remedy the severity. With the advancement of AI technology, machine learning and deep learning are performing a very important role by automatically finding the types of tumors. A machine learning model needs many data to learn the features of the dataset more precisely. Data scarcity can lead to weak accuracy and can introduce bias toward the higher class. In this study, the BreakHis dataset has been used which contains histopathological images of breast tissues of different magnification factors. The datasets have two classes, but the distribution of images is quite imbalanced. The dataset is balanced by adding generated images to the minority class by using a deep convolutional generative adversarial network (DCGAN). For the classification, four pre-trained deep convolutional neural networks (deep CNN), namely DenseNet, MobileNet, ResNetV2 and Xception, have been applied. After applying DCGAN, the performance has been improved with a maximum increase of 2.92%. As for the classification, the DenseNet model with DCGAN has given the overall top performance in this study. Moreover, the result of this study has outperformed most of the state-of-the-art works in identifying malignancy of breast tissue from histopathological images.

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Deep Learning Approach for Electricity Load Forecasting Using Multivariate Time Series Data

Shishir Zaman, Md. Nayeem, Rifah Tatrapi and **Shamim Ripon***

ABSTRACT

Electricity load forecasting plays a vital role in planning power systems in any region. A reliable forecast model is essential to implement an affordable and sustainable energy system. Several studies reveal that weather conditions in a region have a strong relation with energy generation. This paper presents deep learning models to forecast electricity demand considering both energy generation and weather factors in a region. The deep learning models consist of LSTM, stacked LSTM, and CNN-LSTM. In addition, ARIMAX forecasting is applied to compare the effectiveness of the deep learning models. With RRMSE of 1.528%, the CNN-LSTM model outperforms not only the other LSTM models but also ARIMAX confirming the usability of the proposed model.

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An Efficient Breast Cancer Analysis Technique by Using a Combination of HOG and Canny Edge Detection Techniques

Ramisha Anjum, Rubaiya Rahman Dipti, Harun Or Rashid and **Shamim Ripon***

ABSTRACT

Breast cancer is a common and frequent cancer among women all over the world and one of the major causes of cancer related deaths. Early and timely detection of breast cancer plays a key role for the proper treatment of the disease. Pathological diagnosis of such cancer is a very important part and if applied in an effective manner would save a lot of lives. The diagnosis includes the analysis of histopathological images of the cancer cells and it is a tedious task and requires a certain level of expertise. This paper proposes a machine learning approach to analyse the histopathological images of breast tissues and shows an improved technique for the detection of malignant (cancerous) cells. Feature extraction from images plays the central role in image processing. A combination of Histograms of oriented gradient (HOG) and Canny Edge detection technique is applied for extracting features which are then reduced by applying Principal component analysis. Classification algorithms like Support Vector Machine (SVM), Logistic Regression (LR) and Adaboost are used to train the proposed model. The experiment shows 94% correct detection of malignant or cancerous cases. Different types of comparisons are shown to identify the suitable method that can help pathologists in the process of breast cancer detection.

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Analyzing and Evaluating Boosting-Based CNN Algorithms for Image Classification

Masrafi Rahman, Raiyan Prodhan, Yeasir Shishir and **Shamim Ripon***

ABSTRACT

CNN is the most widely used method for image classification. In many occasions, its accuracy is improved by combining it with several boosting techniques. Determining such an efficient boosting model can be very time conserving and benevolent for many image classification applications. This study aims at analyzing and evaluating the performance of CNN added with various boosting techniques, namely XGBoost, Gradient Boost and AdaBoost. At first, CNN mode is trained, and image features are extracted by using convolutional layers, then for training the boosting algorithms intermediate data is extracted from three different layers of the CNN model. After comparing the performance of each individual techniques, it is revealed that boosted CNNs overperforms the others. While comparing the performances of the three CNN-Boosting algorithms, using data extracted from the flatten layer and the first dense layer, CNN-Gradient Boost performs better with an average of approximately 0.1921% more test accuracy and 0.2455% more F1 score for the flatten layer and 0.0505% more test accuracy and 0.0479% more F1 score for the first dense layer. For the third dense layer, CNN-XGBoost achieves better result with 0.0505% more test accuracy and 0.0479% more F1 score than the others. This finding is beneficial to improve performance of any application requiring image classification.

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An Efficient Approach to Software Fault Prediction

Md Anuvob Pradan, Mahia Binte Mizan, Moon Howlader and **Shamim Ripon***

ABSTRACT

The use of machine learning concepts in the software engineering field is now ubiquitous to predict software defects. Most of the Software Defect Prediction (SDP) datasets are highly imbalanced and filled with multiple irrelevant features that cause negative effects on the results. The goal of this paper is to create an approach to predict the software faults efficiently from imbalanced and multi-featured SDP datasets. Two highly imbalanced and multi-featured NASA MDP datasets have been used in this experiment. Initially, data cleaning has been performed with the help of Z-score technique to eliminate noisy instances. To balance the datasets, Synthetic Minority Oversampling Technique (SMOTE) oversampling technique has been used. Furthermore, to select the relevant features, three well-known feature selection techniques, as well as their ensembles, have been applied. Finally, to measure the performance, four well-known classification algorithms are implemented and evaluated the results by their accuracy, TPR and TNR.

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Design of I-V Scanner to Analyze the Effects of Partial Shading Due to Soiling and Bird-Dropping on PV Panels

Mohammad Didarul Islam*, Md Aminul Islam** and **M. Ryyan Khan*****

ABSTRACT

In-field photovoltaic (PV) panel's performance degrades with time due to soiling. Although this degradation is expected to be revered after cleaning, many cleaning techniques are inefficient close to the panel edges creating non-uniform shading. Partial or non-uniform shading on the PV module non-linearly decreases output power, degrades panel lifetimes, and therefore can be detrimental to the PV farm economics. In this paper, we have designed a simple I-V scanner to analyze the changes in the I-V and P-V characteristics curves of the PV panel. We use the I-V scanner to study and analyze partial shading conditions which emulate bird-droppings and non-uniformly distributed soiling accumulation on the surface of PV module or panel. Finally, we summarize the results through the maximum power point (MPP) of the PV panels under different shading conditions. We explain how panel-edge soiling bands (after cleaning) or bird droppings suppress panel-array output—these should therefore be carefully addressed in solar farms for optimal operation.

Keywords: Photovoltaic Systems, Economics, Degradation, Correlation, Soil Measurements, Photovoltaic Cells, Soil

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Microwave Head Imaging System for Detection of Blood Clots inside the Brain

Farhana Parveen* and Parveen Wahid

ABSTRACT

Microwave head imaging can be a cost-effective alternative to MRI or CT scan for detection of any strong scattering object such as- a tumor or blood clot inside the brain. In this paper, a microwave head imaging system is proposed for detection and localization of a blood clot inside the brain by dividing the head imaging plane into four quarters and scanning over one quarter at a time. A miniaturized wideband antipodal Vivaldi antenna design is incorporated to scan the head using a monostatic approach. An image of the head is reconstructed by scanning each quarter of the head. Finally, the images obtained from four quarters are compared for detection and approximate localization of the blood clot inside the brain.

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The Emergence Threat of Phishing Attack and The Detection Techniques Using Machine Learning Models

Sadia Parvin Ripa, Fahmida Islam and **Mohammad Arifuzzaman***

ABSTRACT

With the increasing number of the internet users, cybercrime is increasing at a high rate. Among all the cyber- attack, phishing has now confirmed so successful and the number one attack vector. Throughout our investigation of phishing attack, we find that it is the most uses attack and used many ways to attack the targeted user. Attacks by phishing URL, phishing email and phishing websites are very popular way of phishing attack. But now-a-days with the increasing popularity of social media and online gaming, attackers are targeting this media for the phishing attack. Machine learning is giving a new era for both the attackers and the users who want to prevent this attack. In our work we build a twitter spear phishing bot using machine learning. We did experiment on the detection of phishing url, phishing email and phishing website. For the detection of phishing url we used various classifier and with the higher accuracy we focus on the timing to train the dataset. We found that XGBoost classifier gives the higher accuracy 94.44% and took less time. For the detection of phishing email, we used naïve bayes classifier and got the accuracy of 95.15%. In our website detection techniques, we used different classifier and found that Random Forest Classifier gives the higher accuracy of 96.80%.

Keywords: Uniform Resource Locators, Mechatronics, Social Networking (Online), Phishing, Blogs, Media, Electronic Mail

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An Analysis of Supervised Machine Learning Algorithms for Spam Email Detection

Tasnia Toma, Samia Hassan and **Mohammad Arifuzzaman***

ABSTRACT

Email users are increasing at a high rate and a huge number of people's privacy is getting risked by spam email and it also kills valuable time of people most often. Spam email can be malicious as well as it can be of commercial use as in for marketing which are not desirable to us. Hence, detecting and filtering spam emails from several emails is a must work to do. There are enormous machine learning (ML) algorithms and some of them can be used to detect and analyze spam and unwanted emails. In this paper, we use the supervised ML technique on an existing email classification dataset where we explore Naïve Bayes, Support Vector Machine, Random Forest Classifier. Along with observing the accuracy from these algorithms, we showed other performance metric like precision, recall and F1 score etc. We got a high rate of accuracy in each algorithm such as we got 98.8%, 97.6%, 91.5%, 97.8%, 98.5% accuracy in Multinomial Naïve Bayes, Bernoulli Naïve Bayes, Gaussian Naïve Bayes, Random forest classifier, Support vector machine (SVM) respectively.

Keywords: Support Vector Machines, Training, Privacy, Machine Learning Algorithms, Mechatronics, Unsolicited E-Mail, Distributed Databases

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Negotiating the Politics of Power: Tahmima Anam's the Good Muslim and Women's Role in War and Nation Building

Farzana Akhter*

ABSTRACT

In the grand narratives of the history of Bangladesh's birth, women's wartime experiences and their contributions have been pushed to the periphery to institutionalise male monopoly on the annals of war. Even the voices of those who had been sexually violated have been silenced. Only a line or two can be found in the official stereotypical grand narrative of the Liberation War about their sacrifice. In this paper, analysing the personal narratives of Maya and Piya, the two central characters in Tahmima Anam's The Good Muslim (2011), I argue that although war mobilises women to be politically active, in the aftermath of war they are relegated to a subordinate status. Additionally, analysing Maya's reversal of roles from an active participant to a reproductive agent, I reiterate that female and male participation in nation-building is regulated by socially constructed ideas of masculinity and femininity.

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Epiphany of Woolf: Close Reading of the Last Four Paragraphs of a Room of One's Own

Chowdhury Omar Sharif*

ABSTRACT

Virginia Woolf's most iconic writing A Room of One's Own not only suggests women to follow the path of creative faculty but also puts light on the necessity of having the required needs essential for the physiological and psychological development of a woman as an artist. Woolf's style of demonstrating the proper growth of an artist gets its finality in the last four paragraphs of A Room of One's Own where the rhetoric, very interestingly, follows the pattern of American psychologist, Abraham Maslow's 'Hierarchy of Needs'.

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EFL Students' and Teachers' Perceptions of Sources of Students' Demotivation: A Comparative Study

Moriam Quadir*

ABSTRACT

EFL (English as a foreign language) learners' demotivation has not yet recived adequate research attention in the third world countries. This paper reports on a study that was carried out to explore students' and teachers' perceptions of the sources of learners' demotivation to study English as a school subject at higher secondary (HS) level (grade 11 and 12) in Bangladesh. To collect qualitative data from HS students and teachers two interview guides were developed based on the identified EFL demotivation factors in a study (Quadir, 2017) conducted in the educational context of Bangladesh. 30 HS level students and 17 English teachers of five different institutions were interviewed to understand their perspectives of sources of learners' demotivation. The collected data was analyzed following Miles and Huberman's (1994) procedure of qualitative data analysis. A number of discrepancies between HS students' and English teachers' perceptions were identified. Acute gaps were identified in their perceptions of (a) English teachers' instructional style and behavior, (b) private tutoring, and (c) attitude towards English, and (d) students' past experiences. The other perceptions appeared to be less divergent. These insights have implications for education policy makers, curriculum developers, EFL students, and most importantly for EFL teachers' pedagogical preparations.

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Teaching Factors that Affect Students' Learning Motivation: Bangladeshi EFL Students' Perceptions

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ABSTRACT

Research literature consistently suggests that EFL (English as a foreign language) students' motivation is affected by some teaching factors (Falout et al., 2009; Kim et al., 2018; Lamb, 2017). The main purpose of this study is to identify exactly which teaching factors adversely affect students' motivation to study English at higher secondary (HS) level (grade 11 and 12) in Bangladeshi EFL context. To collect qualitative data an interview protocol was developed based on the teaching factors identified in some selected studies conducted in Asian EFL contexts (Kikuchi, 2009; Sakai & Kikuchi, 2009; Trang & Baldauf, 2007; Quadir, 2017). A total number of 40 grade 12 completers were interviewed to collect students' perceptions. Miles and Huberman's (1994) qualitative data analysis procedure was applied to analyze the data. From the analysis five distinct factors, which adversely affect students' motivation, are identified in descending order: teachers' instructional styles and teaching method, private tutoring, teachers' personality and behavior, teachers' competence and classroom management, and teachers' attitude and commitment. Most of these factors comprise further sub-components which detect the underlying sources of students' disinterest. For amelioration of the situations some feasible implications are discussed addressing the identified factors.

Keywords: Bangladesh, Efl Context, English Teachers, Students' De/Motivation, Students' Perceptions

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Decoding the Sundarbans: "Other" Space in Amitav Ghosh's the Hungry Tide

Khadijatul Kaminy*

ABSTRACT

This paper explores the spatial dynamics presented in Amitav Ghosh's The Hungry Tide through analysis of the Sundarbans with the concept of Michel Foucault's "heterotopia" and Edward Soja's "third space." Since the inception of the ideas of heterotopia and third space, they have never been out of relevance, mostly because Foucault provided us with limited information which shows immense possibilities of the notion. Also, Soja hinted at such an amalgamation of reality and imagination in third space which has only amplified the curiosity for the concept. The paper, basically, focuses on spatial dimension of the Sundarbans which makes it a place that exists in a continuous flux. It improves upon both Foucault's hypothesis that claims heterotopia as a counter site allowing transgressive practices in a space and Soja's view of a space where real and imagined come together. This radical novel can be analysed for numerous reasons; however, the present study is fixed on investigating the spatial aspect of the novel which is set in the Sundarbans. The practical and imaginary quality of the Sundarbans, the topography of the Sundarbans, the "otherness" of the place, and the subversive quality invoked by the place will be of utmost importance in this paper. My study will show how the Sundarbans depicted by Ghosh naturally fits into the theories defined by Foucault and Soja. Using this theoretical framework, I expect to unravel diverse spatial aspects of the Sundarbans as presented in the novel.

Keywords: The Hungry Tide, Sundarbans, Heterotopia, Third Space

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Translating Humayun Ahmed: Exploring the Strategies

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ABSTRACT

The current study attempts to investigate the most frequently used translation strategies in translation of selected short stories by Humayun Ahmed from Bengali to English and identify if two translators investigated in this study differ in the application of these strategies. The researcher selected translations done by Mohammad Shafiqul Islam and Arunava Sinha as two popular translators of Humayun Ahmed. To this end, the list of eight strategies proposed by Mona Baker (1992) is adopted as the framework. The materials of this research are sentences, phrases and single words from Bangla texts of stories under consideration. Selected materials are compared and contrasted against the translations while the strategies are identified and extracted. Then the frequency and percentage of the most used translation strategies are calculated. Research findings showed that the mostly used strategy by both translators is "translation by paraphrasing using a related word" which indicates the translator's intention to be loyal to the original.

Keywords: Humayun Ahmed, Short Stories, Mona Baker, Translation Strategies, Translator's Intention

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A National Assessment of Elective Cesarean Sections in Bangladesh and the Need for Health Literacy and Accessibility

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ABSTRACT

There has been a gradual rise in the number of cesarean sections (CSs) in Bangladesh. The present study identified the cohort of women, who were more likely to opt for an elective CS using the Bangladesh Multiple Indicator Cluster Survey-2019. The survey stratification adjusted logistic regression model and interpretable machine learning method of building classification trees were utilized to analyze a sample of 9202 women, alongside district-wise heat maps. One-in-five births (20%) were elective CSs in the 2 years prior to the survey. Women residing in affluent households with educated house-heads, who accessed antenatal care prior to delivery (AOR 4.12; 95% CI 3.06, 5.54) with regular access to media (AOR 1.31; 95% CI 1.10, 1.56) and who owned a mobile phone (AOR 1.25; 95% CI 1.04, 1.50) were more likely to opt for elective CSs, which suggests that health access and health literacy were crucial factors in women's mode of delivery. Spatial analyses revealed that women living in larger cities had more elective CS deliveries, pointing towards the availability of better health and access to multiple safe delivery options in peripheral areas.

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Public Libraries' Responses to a Global Pandemic: Bangladesh Perspectives

Dilara Begum*, **Md Roknuzzaman**** and Mahbub E. Shobhanee***

ABSTRACT

The whole world is experiencing a new reality – the global outbreak of COVID-19, which has forced every institution into lockdown. This study aims to explore the responses of the government public libraries of Bangladesh. An online questionnaire was used to gather primary data from all of the 71 public libraries, which was followed by semi-structured interviews with eight librarians. The analysis suggests that more than 50% of the libraries had a low level of preparedness to face any crisis, and none of the libraries were fully prepared to manage this pandemic. All of the libraries were open for administrative functions without physical access to users. The study found that 52% of the libraries created public awareness through social media, while 46% supported local government organizations and 40% provided counselling services. Considering the existing challenges, the study recommends some measures for the public libraries of Bangladesh to cope with this situation.

Keywords: Bangladesh, Public Library, Pandemic, COVID-19, Virtual Services

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Evolving Roles of East West University Library During the COVID-19 Pandemic

Shaharima Parvin*, **Dilara Begum****, **Mahbub E. Shobhanee***** and Md. Nazmul Hasan*****

ABSTRACT

COVID-19 is a global pandemic disease that was first identified in Wuhan, China. The global reaction to the COVID-19 is varied, but on the whole, the world economy has been seriously deteriorating. COVID-19 has impeded the world's democratic, social-economic, cultural, and religious systems. Globally, educational institutions have been shut down, but their learning activities are being shifted online. Therefore, libraries have been providing diversified resources and services that are important to the needs of users during this pandemic situation. This study aims to comprehensively discuss the ways East West University Library (EWUL), Bangladesh transformed its role during COVID-19 pandemic situation as well as delineate the challenges faced in this quest. This study is basically exploratory in nature. A systematic literature review and document analysis has been conducted, and the author's viewpoints and experiences have also been incorporated in this chapter.

Keywords: Disinformation, Misinformation, Remote Access, Interlibrary Loan, Information Literacy, Infodemic, Chatbot, Bibliotherapy

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Stages of the Rohingya Genocide: A Theoretical and Empirical Study

Mohammad Pizuar Hossain*

ABSTRACT

This article delineates processes of the ongoing Rohingya genocide by analyzing victim narratives through the lens of Gregory H. Stanton's model of ten stages of genocide. Addressing the issues from theoretical and empirical perspectives offers a structured—if refracted—view of the plans, policies, and actions of the perpetrators. While bringing in historical origins and socio-political factors, the article rests primarily on victims' accounts, along with evidence gathered by human rights organizations and the international press. The leaders of Myanmar seem intent on limiting international understandings of their program to simple ethnic cleansing—not prosecutable under the 1948 Convention on the Prevention and Punishment of the Crime of Genocide. But while internal documents would be required to reveal the regime's intentions and so validate Stanton's model, testimonies and witness accounts afford ample grounds to assess the evolution of events as genocide. The following privileges the experiences and narratives of grassroots Rohingya victims.

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Bangladesh-India Water Sharing Cooperation: An analysis from the Perspective of the International Environmental Law Principles

Mohammad Pizuar Hossain*

ABSTRACT

Bangladesh and India have signed bilateral agreements and took several initiatives on transboundary water cooperation. Environmental critics have for many years questioned the overall management of water cooperation efforts between these two countries, considering especially water pollution and degradation. However, it is not clear the extent to which these countries comply with international environmental law principles in creating and implementing water sharing agreements. This article, therefore, aims to assess the issues of compliance with the 'no harm' principle, the 'precautionary' principle and the 'polluter pays' principle, all of which assist the states to achieve sustainable development and are purportedly applicable to water sharing management agreements between Bangladesh and India. This article mainly focuses on the management of water sharing of the Ganges, the Teesta and the proposed Tipaimukh dam projects through a consideration of existing studies on transboundary water cooperation between Bangladesh and India.

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Manchester Journal of Transnational Islamic Law and Practice, Volume 17, Issue 1, ISSN Number: 2633-6626, Page Numbers: 245 – 263, Year of Publication: 2021

Justice Delayed is Justice Denied: Post-Conflict Experiences of the Bangladesh War of Independence

Mohammad Pizuar Hossain*

ABSTRACT

The Pakistani military operations of the Bangladesh war of independence led to killing of civilian Bengali people, including Bengali intellectuals, raping of Bengali women, destroying its cultural property, and forcible deportation of millions of people to India. The Pakistani military officials, who were the main planners and executors of the operations, and their local collaborators were accused of committing, inter alia, crimes against humanity, genocide, and war crimes during the war. Bangladesh began prosecuting the local collaborators after almost forty years to ensure justice to the victims. However, neither Pakistan nor Bangladesh could ensure justice to the victims by prosecuting the Pakistani military officials. As a result, the country is still suffering from the wounds. This article explores how justice for the victims has been delayed and also denied analysisng the hostile plans and policies that Pakistani military officials undertook during the 1971 war and the post-conflict experiences of the Bangali people.

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Risk factors for Early Childhood Disability in Bangladesh: Evidence from Multiple Indicator Cluster Survey 2019

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ABSTRACT

Introduction: Early childhood is a vital part of human life because most of the brain developments occur in this particular period. Early childhood disability is a significant global public health burden, which can negatively impact the children's quality of life and their overall productivity. It is also a major social and economic problem in Bangladesh. Therefore, it is very important to understand the associated factors for early childhood disability, which may help disability prevention, better management and policy formulation. The main objective of this study is to investigate the child, family, and community-level factors associated with early childhood disability in Bangladesh. Methods: A cross sectional nationally representative data was derived from Multiple Indicator Cluster Survey (MICS), 2019. A total of 14,072 Bangladeshi children under five years of age were selected for this study. Various types of statistical analysis (simple, bivariate, multivariable) were performed. To assess the bivariate relationship between chosen categorical variables (independent) and early childhood disability (dependent), a chi-square test was used. The multivariable ordinal logistic regression was used to find out the association of disability with child, family, and community-level factors. Results: The results show that 2.0% of the children have at least one disability and 0.8% have more disabilities. Several factors namely not attending in early childhood education [Odds Ratio (OR) = 0.65; 95% confidence interval (CI) = 0.13–1.17 P = 0.01], having mother's functional difficulty (OR = 1.23; 95% (CI) = 0.58–1.88 P <0.001), unhappy mother's life (OR = 0.85; 95% CI = 0.30–1.39 P <0.001), parents without internet access (OR = 0.68; 95% CI = 0.06–1.29 P = 0.03) and parents using mobile phone (OR = 0.52; 95% CI = 0.09–0.95 P = 0.02) were found to be important for early childhood disability in Bangladesh. Conclusion: Early childhood disability is still neglected in Bangladesh and further epidemiological studies are recommended. The findings of this study may help policy makers and relevant stakeholders to develop interventions for reducing the overall burden of early childhood disability.

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A Systematic Review on Knowledge-Attitude-Practice on diabetes: Assessment Process and Outcome Levels

Bilkis Banu*, Farzana Yasmin*, **Mobarak Hossain Khan****, Liaquat Ali***, Rainer Sauerborn*, Aurélia Souares*

ABSTRACT

This systematic review aimed to gather scientific evidence regarding the methods and indicators used to measure Knowledge Attitude and Practices (KAP) related to their disease among patient with diabetes and the level of KAP measured as outcome. 65 studies were included in this review following the defined inclusion and exclusion criteria and using the 7 electronic databases. Reviewed papers were categorized according to the assessment process of KAP in the studies. Articles were described and analyzed according to a list of criteria defined: the publication year; research location; study design; age of study subjects; addressed issues, process to measure and level of KAP in the article. Assessment of KAP on diabetes was expressed by mean, categories, percentage or in combined process. Majority of the reviewed studies were cross sectional (n=46, 71%), performed among adult patients (n=59, 91%), conducted in Asia (n=39, 60%) and used non- standardized questionnaire (65%). In most of the studies, level of knowledge and attitude on diabetes was found to be average (n=39, 60% & n=7, 11% respectively) and practices were found poor (n=12, 19%). The findings showed different types of indicators produced to measure KAP and the different dimensions being used either independently or together. There is a need for a standard validated questionnaire to be able to produce a measure of knowledge and behaviors of patients with diabetes that will be valid and comparable.

Keywords: Knowledge, Attitude, Practice, Diabetes, Assessment Process, Outcome Levels

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COVID-19: Marking the Gaps in Migrant and Refugee Health in Some Massive Migration Areas

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ABSTRACT

The health of migrants and refugees, which has long been a cause for concern, has come under greatly increased pressure in the last decade. Against a background where the world has witnessed the largest numbers of migrants in history, the advent of the COVID-19 pandemic has stretched the capacities of countries and of aid, health and relief organizations, from global to local levels, to meet the human rights and pressing needs of migrants and refugees for access to health care and to public health measures needed to protect them from the pandemic. The overview in this article of the situation in examples of middle-income countries that have hosted mass migration in recent years has drawn on information from summaries presented in an M8 Alliance Expert Meeting, from peer-reviewed literature and from reports from international agencies concerned with the status and health of migrants and refugees. The multi-factor approach developed here draws on perspectives from structural factors (including rights, governance, policies and practices), health determinants (including economic, environmental, social and political, as well as migration itself as a determinant) and the human security framework (defined as "freedom from want and fear and freedom to live in dignity" and incorporating the interactive dimensions of health, food, environmental, economic, personal, community and political security). These integrate as a multi-component 'ecological perspective' to examine the legal status, health rights and access to health care and other services of migrants and refugees, to mark gap areas and to consider the implications for improving health security both for them and for the communities in countries in which they reside or through which they transit.

Keywords: COVID-19, Migrant and Refugee Health, Massive Migration, Health Framework, Structural Factors, Health Determinants, Human Security, Health Gaps, Sustainable Development Goals

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Female Leadership in the Local Governments: Reconstruction of Traditional Gender Identity of Women in Rural Bangladesh

Mumita Tanjeela*

ABSTRACT

The local government bodies of Bangladesh have always been dominated and controlled by men--the traditional power holders. Bangladeshi rural women are mostly confined to household chores and engaged in subsistence agricultural activities due to the patriarchal social system and a rigid gender division of labour. Moreover, women's lives are controlled by cultural and religious gender norms which limit their mobility in public spaces and political participation. Hence, women's participation in local government has always been a symbol of tokenism up until the introduction of a direct election system for women. Given this context, this study explores how Bangladeshi rural women have proved themselves to be the change-makers in the rural society and what influencing factors supported them in reconstructing their traditional gender identities despite social and structural constraints. The study was conducted through a qualitative inquiry by adopting a case study approach. Data and information for the study were collected through 12 in-depth (IDI) interviews of elected female Union Parishads (lowest local administrative unit) (UP) chairpersons, UP members and Upazila (subdistrict local administration council) female vice chairpersons along with four focus group discussions and five key informant interviews from four selected districts of Bangladesh. This study concluded that these female leaders are enormously motivated and committed to reshaping their traditional gender identity and altering unequal gender power relations that predominantly factor in the rural social fabric of Bangladesh.

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Suicidal Behaviour and the Coronavirus (COVID-19) Pandemic: Insights from Durkheim's Sociology of Suicide

Anisur Rahman Khan*, **S.M. Anowarul Kayes Shimul**** and Najuwa Arendse

ABSTRACT

Whilst suicide is well established as a critical global public health burden causing around 800,000 deaths annually along with many more attempts, there is a concern that the impact of the coronavirus (COVID-19) pandemic might intensify suicidality. The purpose of this study is to draw attention to the budding correlation between the COVID-19 pandemic and suicidality from the theoretical perspective of Emile Durkheim's sociology of suicide. A review of online newspaper databases (1 January to 30 April 2020) that reported suicide cases and attempts triggered as a result of the disruptions caused by the COVID-19 pandemic were included and analysed. Out of the 28 identified cases, there were three suicide attempts, one homicide-suicide/pact-suicide, and 24 suicides spanning 10 countries. Durkheim explained the social causation of suicide and provided a four-fold suicide typology. The cases were analysed according to their appropriate typology, and classified as egoistic (9), altruistic (3), anomic (8), and fatalistic (8). Durkheim suggests that the rise and fall of suicide rates will depend on the nature of social change. As society is undergoing massive social disruption resulting from the COVID-19 pandemic, suicide rates may increase unless suicide prevention measures align with the current social reconstruction process.

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Demographic Risk Factors and Motives of Male Suicide in Bangladesh: A Retrospective Content Analysis

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ABSTRACT

Suicide is a serious but under-attended public health issue in Bangladesh. There is no national suicide surveillance mechanism or central data/information repository. At this backdrop, a data repository is being developed by the researchers on male suicide extricating reports published in the leading Bangladeshi newspapers. Being the maiden reporting, this analysis presents risk factors and motives of male suicide for one year (January to December 2018). For this specific analysis, key variables on risk factors and motives of suicide presented and analysed through descriptive statistical techniques and corroborated by the relevant literature. The final reporting was made on 113 cases identified during the period. Students, unmarried, young adults (19-30 years), and persons with an undergraduate level education demonstrate a higher prevalence of suicidality. Hanging is the most frequently used method, and the night is the most preferred time for suicide. As per Emile Durkheim's sociological typology of suicide, predominant motives of suicide are embedded in the egoistic category, followed by anomic category. It is suggested to undertake large scale statistical surveys on male suicide in Bangladesh. Moreover, a multisectoral suicide prevention intervention is strongly recommended.

Keywords: Male Suicide, Risk Factor, Motive, News Papers, Content Analysis, Bangladesh

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Open Access Repositories in Bangladesh and India: A Comparative Analysis

Md. Hasinul Elahi *, **Dilara Begum **** and M. Nasiruddin Munshi ***

ABSTRACT

The objective of this study is to compare the present status of open access repositories in Bangladesh and India based on certain predetermined characteristics. Open Directory of Open Access Repositories (OpenDOAR) as a data-gathering instrument had been accessed for extracting the data from the period of 01-06 August, 2020. The results reveal that a total number of 108 repositories were registered in the OpenDOAR from Bangladesh and India in which India has more repositories than Bangladesh. The comparison between the repositories clearly indicates that Bangladesh is lagging behind in terms of developing OAR with only 14 repositories whereas India is leading the chart with 94. It is also evident that the repositories from India are more diversified in terms of content language which includes more than ten languages in comparison with only two in Bangladesh. In using software to manage the resources, the repositories from Bangladesh are using DSpace and Greenstone whereas diversified forms of software are being used in India. India is also far ahead in terms of the nature of content type and subject of the content in comparison to Bangladesh. The main drawback of the present research is that the findings are solely based on the data collected through the repositories indexed in OpenDOAR. The analysis of OAR of these two countries will help the library and information professionals to benchmarks their quality and also help in identifying issues to be addressed for fostering the growth of OAR.

Keywords: Open Access, Open Access Repositories, Bangladesh, India, Open Access System, Opendoar, Comparative Study

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Rapid migration from traditional or hybrid to fully virtual education in the age of the coronavirus pandemic: challenges, experiences and views of college and university students

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ABSTRACT

The abrupt outbreak of the coronavirus pandemic throughut the world in March 2020 resulted in the sudden closure of all schools, colleges and universities, institutions, and an unprecedented pivot to remote learning. Students and teachers were confronted with the overwhelming challenge of migrating from the traditional face-toface or hybrid mode of education to fully virtual learning and assessment environments within an extremely short amount of time. This migration was exceptionally difficult, as it took place halfway through the academic or school year in most countries. While pandemic restrictions currently vary across different regions, the 2020-2021 academic session continues to pose challenges despite the experience gained. In addition to a review of the current state-of-theart in relation to the effects of COVID-19 on teaching and learning, this paper reports on an empirical study carried out in 26 countries (from Asia, Europe, Africa, and America), by 36 academics from 29 academic institutions. Through an extensive global survey of college and university students, information was collected about the challenges (technological, economic, psychological) faced by them, as a result of the pandemic. We also asked the students to offer their ideas and suggestions for further improvements in teaching and learning, as we look toward a post-COVID-19 world. In this paper, we address issues relating to the availability of, and accessibility to, necessary digital technologies (e.g., learning and communication platforms), isolation, disconnection, and loneliness among students, the overall impact of the pandemic on learning and academic performance, and the reliability of assessment methods, cybercrime dangers and fake information. A total of 1005 responses to the survey were received and analysed. The results are presented in this paper together with reflections of the authors. The paper concludes with a summary of suggestions for process improvements in distance education, and the need for preventive preparedness in the post-COVID period.

Keywords: Distance mode education, e-learning, cyber-protection, rapid migration, socio-digital divide, inequalities, Covid-19 pandemic

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The Need for Understanding Disaster Risk for Resilient City Development

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ABSTRACT

Rapid urbanization has been a common phenomenon in most developing countries. Asia is no exception. Many major Asian cities are fast-growing but without proper physical planning guidelines. For instance, development is taking place in areas that are prone to risk from natural hazards and could be seen as a serious concern. With a view to reduce damage and encourage resilient development, the Sendai Framework on Disaster Risk Reduction (SFDRR) has emphasized on understanding disaster risk. This paper has tried to understand the current situation in Asian cities with regard to resilient development. Publicly available data and information published, are used to understand the development patterns of the major cities in Bangladesh, Myanmar, and Thailand. This research finds that Asian cities are at a very early stage in understanding disaster risk and climate change effects ahead of city planning and physical expansion. As a result of unplanned development without considering potential risks, citizens are becoming vulnerable to natural hazards. Therefore, it is important to understand the potential disaster risks and climate change impacts for resilient city development and for effective urban planning. The outcome of the paper will help in formulating policy guidelines for the respective cases.

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