THE ATHENS INSTITUTE FOR EDUCATION AND RESEARCH

Abstract Book

19th Annual International Symposium on Economic Theory, Policy & Application
1-4 July 2024 Athens, Greece

Edited by
Gregory T. Papanikos & Olga Gkounta

2024

Abstracts
19th Annual International Symposium on Economic Theory, Policy & Application

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TABLE OF CONTENTS

(In Alphabetical Order by Author's Family Name)

Preface		11
Editors' Note		13
Organizing & Scientific Committee		14
Conference Program		15
1.	**Pedagogical Innovation to Enhance Mathematical Learning and Cross-Disciplinary Skills in Incoming Mathematics Faculty Students** *Mahsa Allahbakhshi*	24
2.	**Outperformance versus Due Diligence: Which Produces Investment Winners?** *Medhat Alsafadi & Apostolos Xanthopoulos*	26
3.	**Critical Comparison of Social Media Marketing Technologies in HE of Saudia Arabia and Scotland for International Student Recruitment** *Abdulelah Abed Althagafi*	27
4.	**Using Statistical and Econometric Modeling to Enhance Predictive Machine Learning in Transportation Safety Research: A Theoretical Framework** *Panagiotis Anastasopoulos*	28
5.	**Selected Facts** *Nemanja Antic*	29
6.	**The Role of Interprofessional Education on Positive Attitude Development: An Experimental Study on Nursing and Medical Students** *Gulem Atabay, Burcu Güneri Çangarlı & Burcu Peslikan*	30
7.	**Service Encounter Toxicity and Role Maintenance: A Moderated Mediation Model of Perfectionistic Self-Presentation and Difficulty to Maintain Display Rules** *Ahmed Khalil Ben Ayed & Marc Alexandre Tomiuk*	31
8.	**FazBoard: An AI-Educational Hybrid Intelligent Teaching & Learning System** *Fawzi Benmessaoud & Mohamed Habib Agrebi*	33
9.	**Pointwise Symmetry of Birkhoff-James Orthogonality and Geometry of $\mathbb{B}(\ell_n^\infty, \ell_m^1)$** *Babhrubahan Bose*	34
10.	**Assessing the Economic Benefits of Biotechnology in Canada** *Derek Brewin & Stavroula Malla*	35
11.	**Using Human-Friendly Scheffé Comparisons to Explore Group Differences in One-way ANOVA** *Gordon Brooks & Nina Adjanin*	37
12.	**Labor Market Slack and Monetary Policy in an Emerging Economy: A Gender Approach** *Elizabeth Bucacos*	39

13.	**The Bioeconomy as an Option for Economic Development** *Jorge Ivan Bula-Escobar & Giovany Armando Astroz-Marin*	40
14.	**An Analytical Study of Diophantine Equations of Pythagorean Form** *Carmelo Raffaele Cartiere*	42
15.	**Marketing Strategies for Digital Games in the Globalized Market** *YuPei Chang*	43
16.	**The Threshold Effect of Digital Service Trade on Carbon Emissions in RCEP Countries** *Xiaowen Chen*	45
17.	**Euclid Absent from the Standard Model of Particle Physics** *Dimitris Christodoulou*	46
18.	**Wage Productivity Gap and Labour Market Flexibility: A Study based on Indian Manufacturing Industries during 1973-2020** *Byasdeb Dasgupta*	47
19.	**Marketing Development in Finland and Ukraine: Comparative Analysis** *Oksana Domina*	49
20.	**Tropical Cryptography – The State of The Art and Future Prospects** *Mariana Durcheva*	50
21.	**How to Teach Literacy to Artificial Neural Networks** *Thomas Fehlmann & Eberhard Kranich*	52
22.	**Unicorn Valuation Post IPO: An Empirical Analysis** *Bruno Fiesenig*	53
23.	**Impact of Institutional Barriers on International Marketing of Healthcare Services: Elekta in the Emerging Market of South Africa** *Maria Fregidou-Malama, Vannie Naidoo, Michele Rydback & Akmal Hyder*	54
24.	**Improving Text Survey Response Rates by Timing** *Lance Gentry*	56
25.	**The Effects of the Extended Market Size of Regional Trade Blocs on FDI Inflows: A Dynamic Panel Analysis** *Pascal Ghazalian*	57
26.	**An Early-Warning System Against Violence for Woman: Türkiye Example** *Sahika Gokmen, Sibel Atan, Rukiye Dagalp & Murat Atan*	59
27.	**Fast Multivariate Newton Interpolation for Downward Closed Polynomial Spaces** *Michael Hecht*	60
28.	**Bargaining in the Labor Market** *Joerg Heining, Sydnee Caldwell & Ingrid Haegele*	61
29.	**The Time-varying Impact of Monetary Policy Shocks on the Cryptocurrency Uncertainty Indices** *Mohamad Husam Helmi, Abdurrahman Nazif Çatık, Coşkun Akdeniz*	62

	& Arya Akdeniz	
30.	**Causal Theories Explaining Erosion in South African State and Public Services: A Theoretical Overview** *Rozenda Hendrickse*	63
31.	**The Inequality Effect of Industrial Robots: Evidence from Working Hours** *Lingyun Huang & Yanjun Zou*	64
32.	**Gendering [Female] Entrepreneurship Conversations – Leadership, Power and Culture Conundrum** *Chux Gervase Iwu*	65
33.	**Symbolic Brand Positioning on the Music Streaming Market: An Axiological Framework** *Frederic Jallat*	67
34.	**Update on a+b=c** *Karl Javorszky*	69
35.	**The Effectiveness and Efficiency of the New Public Policies** *John Kallianiotis*	71
36.	**Improving Variational Characterization Interval Bounds to Gyroscopic Problems** *Aleksandra Kostic, Valentina Timotic & Izet Horman*	72
37.	**A Case Study of Rural Teachers Developing Bilingual Mathematics Teaching through a Teacher Professional Learning Community** *Yenting Lai & Erh-Tsung Chin*	73
38.	**Measuring Current Regional Disparities in The European Union and the Future of EU Cohesion Policy** *Peter Lesko*	75
39.	**Sustainability Assessment and the Importance of Environmental Indexes for Companies Operating in Slovakia** *Radka Leskova*	76
40.	**Contributing and Constraining Factors Regarding the Implementation of Human Resource Management on Boarding during the COVID-19 Pandemic at the City of Tshwane Metropolitan Municipality in South Africa** *Karel Lessing, Jean Oberholzer & Cecile Schultz*	78
41.	**Sustainable Energy Development Strategy for Poland** *Magdalena Ligus & Piotr Peternek*	80
42.	**LIMOS – LightGBM Interval Merton's One-period-portfolio Selection** *Liang-Ching Lin*	81
43.	**The Optimal Replenishment and Packaging Policies for Deteriorating Items with Logistics Loss** *Tien-Yu Lin*	82
44.	**Re-Thinking Strategy Formulation** *Michael MacColl*	83
45.	**Analysis and Construction of Indicators for Public Investment in Colombia**	84

	Karina Manrique Lopez & Nicolas Marciales Parra	
46.	**Implementing Image Analysis with Azure AI Vision and Open AI for Predictive Analysis** *Mihail Mateev*	85
47.	**A Novel Approach in Multivariate Outlier Detection** *Nemanja Milenković, Aleksandar Doković & Zoran Radojičić*	86
48.	**Exploring Motivations and Preferences in Digital Influencer Engagement among American and Portuguese Higher School Students** *Sandra Miranda, Sandra Pereira, Tatiana Nunes, Zélia Raposo Santos & Ana Teresa Machado*	87
49.	**Developmental Graphs Comparison Strategy for Analysis of Pattern Formation and Phylogeny** *Nadya Morozova*	89
50.	**Do Insiders Follow their Competitors' Trades?** *Jason Moschella*	90
51.	**Decrypting Evolutionary Fractals using Intelligence Models based on the CSN Matrix** *Catalin Silviu Nutu*	91
52.	**Estimating Labour Market Matching Efficiency at Different Educational Levels** *Alka Obadic & Viktor Viljevac*	93
53.	**Some Thoughts on Teaching Set Theory** *Ivonne Pallares-Vega*	95
54.	**Labor Market, Gender Differences and Family Policy** *Merita Pelaj & Avdullah Hoti*	96
55.	**Learning to Export like China: From Processing Trade to Ordinary Trade** *Larry Qiu, Qing Liu & Stephen Yeaple*	97
56.	**Transforming a Commodity into a Premium Brand: Avocados from Mexico Case** *Martha Rivera Pesquera*	98
57.	**Inner Management and a Possible New Type of Human Intelligence** *Irina Rodriguez De La Flor*	99
58.	**The Academic Portfolio as an Assessment Purpose-Driven Tool in the Training of Primary School Teachers in Mathematics** *Carlos Rojas*	101
59.	**How Close are Macro-Economics/Macro-Thermodynamics? The Knowledge & Energy Pair Economies in the Net Zero Era** *Hemmat Safwat*	103
60.	**Structural Change, Growth and the Increasing Service Trade in Low- and Middle-Income Countries** *Joydeb Sasmal*	104
61.	**The Future of Work Study in the South African Context** *Cecile Schultz, Kelebogile Madiba, Leigh-Anne Paul Dachapalli & Francisca du Plessis*	106

62.	**Interest Rate and Inflation Relationship-Fisher Hypothesis: Definition of the Inflation Basket** *Nurhan Hande Sevgi*	108
63.	**Innovation or Imitation? Effects of Public Health Insurance on Pharmaceutical Development in China** *C. Matthew Shi & Shuangda Wang*	110
64.	**Green Human Resource Management and Firm Performance** *Parbudyal Singh*	111
65.	**If you Can't Beat It, Join It! Teaching and Learning Mathematics with ChatGPT and Key Prompts to Stimulate Self-Learning** *Philip Slobodsky, Mariana Durcheva & Leonid Kugel*	112
66.	**Perceived Factors of the Performance Management and Development System of a South African State-Owned Company** *Pieter Smit, Cecile Schultz & Ofhani Tshila*	114
67.	**Application of Statistics in Evaluation of State of Health and Lifetime of Electrical and Electronic Components** *Jian Song*	116
68.	**On Evolution Cocycles Associated to Control Systems** *Codruta Stoica*	117
69.	**The Impact of Social Transfers on the Consumption of Cultural Goods – The Evidence from Poland** *Adam Suchecki*	118
70.	**The Development of Ethno-mathematics Teaching Activity Design Based on Bunun (a Taiwan Indigenous Tribe) Traditional Weaving** *Weng Sung-Huan, Erh-Tsung Chin & Bo-Han Wu*	119
71.	**Centering Community Voices in Design: Project PEER** *Jeremy Swanston*	120
72.	**Using an Online Dynamic Geometry Curriculum to Gain Insights into Preservice Elementary Teachers' Learning of the Properties of Quadrilaterals** *Viktoria Taroudaki, Michael Winer & Michael Battista*	121
73.	**Development of a Machine Learning Approach to Identify Veterans Carrying the V142I Variant in the US Veterans Administration Healthcare Network** *Craig Teerlink, Anthony Gao, Jeffrey Ferraro, Tyler Nelson, Fatai Agiri, Steven Roblin, Lelund Hull, Scott DuVall, Jacob Joseph, Daniel Berlowitz, Josef Stehlik, Scott Damrauer, Kyong-Mi Chang, Catherine Tcheandjieu & Julie Lynch*	123
74.	**Building Sustainable Business Models through a Hierarchical Ethical Approach and S-D Logic** *Ricardo Teixeira Veiga, Márcio Augusto Gonçalves, André Torres Urdan, Celso Augusto de Matos & Francis Marcean Resende Barros*	126
75.	**Adjusting the Balance between Alpha and Beta Risks in NN Classifiers** *Philippe Thomas, Hind Bril El Haouzi & Marie-Christine Suhner*	127

76.	**Redistributive Consequences of a Global Carbon Tax with Global Distribution of the Revenue** *Nicolaus Tideman*	129
77.	**COVID-19 Asymmetry – Hardly an Ill Wind** *Peter Tingling, Kamal Masri & Stephen Spector*	130
78.	**A Study on the Feasibility of Establishing a Teacher Professional Learning Network through the Implementation of On-line Public Lesson Mode** *Chia-Hao Tsai & Erh-Tsung Chin*	131
79.	**Long-term Benefits of Blood Pressure Management on Memory Complaint Reduction: A Time Series Analysis in a 4-year Prospective Cohort in Hong Kong** *Kelvin Tsoi, Karen Yiu, Ziyu Hao & Ezreal Chen*	132
80.	**Business Startups: Gaining Intelligence from Open-Access Business Qualitative Datasets** *Francine Vachon & Meet Masrani*	134
81.	**The Impact of Leadership on the Grit of International Migrated Teachers** *Lize van Hoek & Shalane Otto*	136
82.	**Between the Central and the Peripheral Route: Investigating the Effectiveness of Communicative Nudging as a Third Advertising Strategy** *Patrick Vyncke*	138
83.	**Income Inequality, Energy Poverty, and Carbon Emissions: A Cross-Country Analysis** *Feng Wang & Mengdie Qu*	140
84.	**The Role of Rumors in the Domestic Sovereign Debt Market: Evidence from Prewar China** *Yajie Wang & Dan Li*	141
85.	**Identifying Sustainability Efforts in Company's Reports using Text Mining and Machine Learning** *Evangelos Xevelonakis*	142
86.	**Impact of ICT on Business Continuity and Sustainable Performance: Mediating Role of Digital Transformation Culture** *Manal Yunis & Michael Mikhael*	143
87.	**The Rise of the Educated Class** *Joseph Zeira*	144
88.	**Ranking by Pairwise Comparison with Preference of Orders** *Shunpu Zhang*	145
89.	**CycleTTA: Continuous Cyclical Test Time Domain Adaptation** *Yun Zhou, Hao Yang, Cheng Zhu & Weiming Zhang*	146
References		148

Preface

This book includes the abstracts of all the papers presented at the *19th Annual International Symposium on Economic Theory, Policy & Application* (1-4 July 2024), organized by the Athens Institute for Education and Research (ATINER).

A full conference program can be found before the relevant abstracts. In accordance with ATINER's Publication Policy, the papers presented during this conference will be considered for inclusion in one of ATINER's many publications only after a blind peer review process.

The purpose of this abstract book is to provide members of ATINER and other academics around the world with a resource through which they can discover colleagues and additional research relevant to their own work. This purpose is in congruence with the overall mission of the association. ATINER was established in 1995 as an independent academic organization with the mission to become a forum where academics and researchers from all over the world can meet to exchange ideas on their research and consider the future developments of their fields of study.

To facilitate the communication, a new references section includes all the abstract books published as part of this conference (Table 1). I invite the readers to access these abstract books –these are available for free– and compare how the themes of the conference have evolved over the years. According to ATINER's mission, the presenters in these conferences are coming from many different countries, presenting various topics.

Table 1. *Publication of Books of Abtracts of Proceedings, 2010-2024*

Year	Papers	Countries	References
2024	89	34	Papanikos and Gkounta (2024)
2023	73	26	Thompson and Gkounta (2023)
2022	55	30	Thompson and Gkounta (2022)
2021	38	19	Papanikos (2021)
2020	44	25	Papanikos (2020)
2019	93	33	Papanikos (2019)
2018	83	33	Papanikos (2018)
2017	18	17	Papanikos (2017)
2016	22	17	Papanikos (2016)
2015	30	18	Papanikos (2015)
2014	25	16	Papanikos (2014)
2013	54	33	Papanikos (2013)
2012	52	29	Papanikos (2012)
2011	84	30	Papanikos (2011)
2010	82	30	Papanikos (2010)

It is our hope that through ATINER's conferences and publications, Athens will become a place where academics and researchers from all over the world can regularly meet to discuss the developments of their disciplines and present their work. Since 1995, ATINER has organized more than 400 international conferences and has published over 200 books. Academically, the institute is organized into 6 divisions and 37 units. Each unit organizes at least one annual conference and undertakes various small and large research projects.

For each of these events, the involvement of multiple parties is crucial. I would like to thank all the participants, the members of the organizing and academic committees, and most importantly the administration staff of ATINER for putting this conference and its subsequent publications together.

Gregory T. Papanikos
President

Editors' Note

These abstracts provide a vital means to the dissemination of scholarly inquiry in the field of Economics. The breadth and depth of research approaches and topics represented in this book underscores the diversity of the symposium.

ATINER's mission is to bring together academics from all corners of the world in order to engage with each other, brainstorm, exchange ideas, be inspired by one another, and once they are back in their institutions and countries to implement what they have acquired. The *19th Annual International Symposium on Economic Theory, Policy & Application* accomplished this goal by bringing together academics and scholars from 34 different countries (Austria, Belgium, Bosnia and Herzegovina, Brazil, Bulgaria, Canada, Chile, China, Colombia, Croatia, Finland, France, Germany, Hong Kong, India, Israel, Kosovo, Lebanon, Mexico, Poland, Portugal, Romania, Saudi Arabia, Serbia, Slovakia, South Africa, Spain, Sweden, Switzerland, Taiwan, Uruguay, UAE, UK, USA), which brought in the symposium the perspectives of many different country approaches and realities in the field.

Publishing this book can help that spirit of engaged scholarship continue into the future. With our joint efforts, the next editions of this symposium will be even better. We hope that this abstract book as a whole will be both of interest and of value to the reading audience. May it be a stimulus for further research and the progress of the discipline.

Gregory T. Papanikos & Olga Gkounta
Editors

19th Annual International Symposium on Economic Theory, Policy & Application, 1-4 July 2024, Athens, Greece

Organizing & Scientific Committee

All ATINER's conferences are organized by the Academic Council. This conference has been organized with the assistance of the following academic members of ATINER, who contributed by reviewing the submitted abstracts and papers.

1. Gregory T. Papanikos, President, The Athens Institute & Honorary Professor, University of Stirling, U.K.
2. Christos Sakellariou, Vice President of Finance, The Athens Institute & Associate Professor of Economics, Nanyang Technological University, Singapore.
3. Henry Thompson, Head, Economics Unit, The Athens Institute & Emeritus Professor, Auburn University, USA.

FINAL CONFERENCE PROGRAM

19th Annual International Symposium on Economic Theory, Policy & Application, 1-4 July 2024, Athens, Greece

PROGRAM

Monday 1 July 2024		
08.30-09.30 **Registration** **09:30-10:00** **Opening and Welcoming Remarks:** o **Gregory T. Papanikos**, President, The Athens Institute.		
10:00-11:30 Session 1		
Session 1a **Moderator: John Kallianiotis**, Professor, University of Scranton, USA.	**Session 1b** **Moderator: Maria Fregidou-Malama**, Professor, University of Gävle, Sweden.	**Session 1c** **Moderator: Timothy M. Young**, Director, Center for Data Science (CDS), Emeritus Professor, The University of Tennessee, USA & CEO and President, T.M. Young Institute, LLC, USA.
1. **Alka Obadic**, Full Professor, University of Zagreb, Croatia. **Viktor Viljevac**, Assistant Professor, University of Zagreb, Croatia. ***Title**: Estimating Labour Market Matching Efficiency at Different Educational Levels.* 2. **Joerg Heining**, Senior Researcher, Institute for Employment Research (IAB), Germany. **Sydnee Caldwell**, Assistant Professor, University of California, Berkeley, USA. **Ingrid Haegele**, Professor, Ludwig-Maximilians-Universität Muenchen (LMU), Germany. ***Title**: Bargaining in the Labor Market.* 3. **Elizabeth Bucacos**, Researcher, Central Bank of Uruguay, Uruguay.	1. **Cecile Schultz**, Professor, Tshwane University of Technology, South Africa. **Kelebogile Madiba**, Lecturer, Tshwane University of Technology, South Africa. **Leigh-Anne Paul Dachapalli**, Senior Lecturer, Tshwane University of Technology, South Africa. **Francisca du Plessis**, Retired Lecturer, Tshwane University of Technology, South Africa. ***Title**: The Future of Work Study in the South African Context.* 2. **Tien-Yu Lin**, Professor, Sanming University, China. ***Title**: The Optimal Replenishment and Packaging Policies for Deteriorating Items with Logistics Loss.* 3. **Michael Mikhael**, MBA Student, Lebanese American University, Lebanon. **Manal Yunis**, Associate Professor, Chair, Department of Information	1. **Shunpu Zhang**, Chair, Department of Statistics and Data Science and Professor, University of Central Florida, USA. ***Title**: Ranking by Pairwise Comparison with Preference of Orders.* 2. **Liang-Ching Lin**, Professor, National Cheng Kung University, Taiwan. ***Title**: LIMOS – LightGBM Interval Merton's One-period-portfolio Selection.* 3. **Philippe Thomas**, Associate Professor, University of Lorraine / CRAN, France. ***Title**: Adjusting the Balance between Alpha and Beta Risks in NN Classifiers.* 4. **Mihail Mateev**, Chief Assistant Professor, UACEG – Sofia, Bulgaria.

***Title**: Labor Market Slack and Monetary Policy in An Emerging Economy: A Gender Approach.* 4. **Medhat Alsafadi**, Assistant Professor, Lewis University, USA. **Apostolos Xanthopoulos**, Assistant Professor, Lewis University, USA. ***Title**: Outperformance versus Due Diligence: Which Produces Investment Winners?*	Technology and Operations Management, Lebanese American University, Lebanon. ***Title**: Impact of ICT on Business Continuity and Sustainable Performance: Mediating Role of Digital Transformation Culture.* 4. **Francine Vachon**, Associate Professor, Goodman School of Business, Brock University, Canada. **Meet Masrani**, Researcher, Goodman School of Business, Brock University, Canada. ***Title**: Business Startups: Gaining Intelligence from Open-Access Business Qualitative Datasets.*	***Title**: Implementing Image Analysis with Azure AI Vision and Open AI for Predictive Analysis.*
11:30-13:00 Session 2		
Session 2a **Moderator: Pascal Ghazalian**, Professor, University of Lethbridge, Canada.	**Session 2b** **Moderator: Francine Vachon**, Associate Professor, Goodman School of Business, Brock University, Canada.	**Session 2c** **Moderator: Shunpu Zhang**, Chair, Department of Statistics and Data Science and Professor, University of Central Florida, USA.
1. **Magdalena Ligus**, Professor, Wrocław University of Economics and Business, Poland. **Piotr Peternek**, Associate Professor, Wrocław University of Economics and Business, Poland. ***Title**: Sustainable Energy Development Strategy for Poland.* 2. **Mengdie Qu**, PhD Student, Chongqing University, China. **Feng Wang**, Professor, Chongqing University, China. ***Title**: Income Inequality, Energy Poverty, and Carbon Emissions: A Cross-Country Analysis.* 3. **Nicolaus Tideman**, Professor, Virginia Tech University, USA.	1. **Martha Rivera Pesquera**, Professor, IPADE Business School, Mexico. ***Title**: Transforming a Commodity into a Premium Brand: Avocados from Mexico Case.* 2. **Frederic Jallat**, Professor, ESCP Business School, France. ***Title**: Symbolic Brand Positioning on the Music Streaming Market: An Axiological Framework.* 3. **Maria Fregidou-Malama**, Researcher, University of Gävle, Sweden. ***Title**: Impact of Institutional Barriers on International Marketing of Healthcare Services: Elekta in the Emerging Market of South Africa.* 4. **Oksana Domina**, Postdoctoral Researcher, University of Helsinki,	1. **Codruta Stoica**, Professor, Aurel Vlaicu University of Arad, Romania. ***Title**: On Evolution Cocycles Associated to Control Systems.* 2. **Dimitris Christodoulou**, Teaching Professor (Retired), University of Massachusetts Lowell, USA. ***Title**: Euclid Absent from the Standard Model of Particle Physics.* 3. **Nadya Morozova**, Researcher, CNRS, Institute Gustave-Roussy, France. ***Title**: Developmental Graphs Comparison Strategy for Analysis of Pattern Formation and Phylogeny.*

***Title**: Redistributive Consequences of a Global Carbon Tax with Global Distribution of the Revenue.* 4. **Xiaowen Chen**, PhD Candidate, Chongqing University, China. ***Title**: The Threshold Effect of Digital Service Trade on Carbon Emissions in RCEP Countries.*	Finland. ***Title**: Marketing Development in Finland and Ukraine: Comparative Analysis.*	
13:00-14:30 Session 3		
Session 3a **Moderator: Elizabeth Bucacos**, Researcher, Central Bank of Uruguay, Uruguay.	**Session 3b** **Moderator: Martha Rivera Pesquera**, Professor, IPADE Business School, Mexico.	**Session 3c** **Moderator: Codruta Simona Stoica**, Head, Mathematics & Statistics Unit, The Athens Institute & Professor and Vice-Rector, Aurel Vlaicu University of Arad, Romania.
1. **John Kallianiotis**, Professor, University of Scranton, USA. ***Title**: The Effectiveness and Efficiency of the New Public Policies.* 2. **Nemanja Antic**, Associate Professor, Northwestern University, USA. ***Title**: Selected Facts.* 3. **Mohamad Husam Helmi**, Assistant Professor, Rabdan Academy, UAE. ***Title**: The Time-varying Impact of Monetary Policy Shocks on the Cryptocurrency Uncertainty Indices.* 4. **Peter Lesko**, Assistant Professor, University of Economics in Bratislava, Slovakia. ***Title**: Measuring Current Regional Disparities in The European Union and*	1. **Karel Lessing**, Senior Lecturer, Tshwane University of Technology, South Africa. **Jean Oberholzer**, Student, Tshwane University of Technology, South Africa. **Cecile Schultz**, Professor, Tshwane University of Technology, South Africa. ***Title**: Contributing and Constraining Factors Regarding the Implementation of Human Resource Management on Boarding during the COVID-19 Pandemic at the City of Tshwane Metropolitan Municipality in South Africa.* 2. **Pieter Smit**, Head, Department People Management and Development, Tshwane University of Technology, South Africa. **Cecile Schultz**, Professor, Tshwane University of Technology, South Africa. **Ofhani Tshila**, Student, Tshwane University of Technology, South Africa. ***Title**: Perceived Factors of the Performance Management and Development System of a South*	1. **Gordon Brooks**, Professor, Ohio University, USA. **Nina Adjanin**, Assistant Professor, Northwest Missouri State University, USA. ***Title**: Using Human-Friendly Scheffé Comparisons to Explore Group Differences in One-way ANOVA.* 2. **Jian Song**, Professor, OWL University of Applied Sciences and Arts, Germany. ***Title**: Application of Statistics in Evaluation of State of Health and Lifetime of Electrical and Electronic Components.* 3. **Kelvin Tsoi**, Associate Professor, The Chinese University of Hong Kong, Hong Kong. ***Title**: Long-term*

the Future of EU Cohesion Policy. 5. **Merita Pelaj**, Master Student, University of Prishtina, Kosovo. **Avdullah Hoti**, Professor, University of Prishtina, Kosovo. ***Title**: Labor Market, Gender Differences and Family Policy.*	*African State-Owned Company.* 3. **Lize van Hoek**, Senior Lecturer, Tshwane University of Technology, South Africa. **Shalane Otto**, Student, Tshwane University of Technology, South Africa. ***Title**: The Impact of Leadership on the Grit of International Migrated Teachers.*	*Benefits of Blood Pressure Management on Memory Complaint Reduction: A Time Series Analysis in a 4-year Prospective Cohort in Hong Kong.*

14:30-15:30 Lunch

15:30-17:00 Session 4

Session 4a **Moderator: Paul Contoyannis**, Head, Health Economics & Management Unit, the Athens Institute & Associate Professor, McMaster University, Canada.	**Session 4b** **Moderator: Gordon Brooks**, Professor, Ohio University, USA.
1. **Joseph Zeira**, Emeritus Professor, The Hebrew University of Jerusalem, Israel. ***Title**: The Rise of the Educated Class.* 2. **Adam Suchecki**, Assistant Professor, University of Lodz, Poland. ***Title**: The Impact of Social Transfers on the Consumption of Cultural Goods – The Evidence from Poland.* 3. **Rozenda Hendrickse**, Senior Lecturer, University of Pretoria, South Africa. ***Title**: Causal Theories Explaining Erosion in South African State and Public Services: A Theoretical Overview.* 4. **Yajie Wang**, PhD Student, Fudan University, China. **Dan Li**, Professor, Fudan University, China. ***Title**: The Role of Rumors in the Domestic Sovereign Debt Market: Evidence from Prewar China.*	1. **Viktoria Taroudaki**, Associate Professor, Eastern Washington University, USA. **Michael Winer**, Associate Professor, Eastern Washington University, USA. **Michael Battista**, EHE Distinguished Professor of Mathematics Education, Ohio State University, USA. ***Title**: Using an Online Dynamic Geometry Curriculum to Gain Insights into Preservice Elementary Teachers' Learning of the Properties of Quadrilaterals.* 2. **Mahsa Allahbakhshi**, Assistant Professor, Pontificia Universidad Católica de Chile, Chile. ***Title**: Pedagogical Innovation to Enhance Mathematical Learning and Cross-Disciplinary Skills in Incoming Mathematics Faculty Students.* 3. **Carlos Rojas**, Assistant Professor, Pontificia Universidad Católica de Chile, Chile. ***Title**: The Academic Portfolio as an Assessment Purpose-Driven Tool in the Training of Primary School Teachers in Mathematics.* 4. **Ivonne Pallares-Vega**, Professor, Autonomous University of the State of Morelos, Mexico. ***Title**: Some Thoughts on Teaching Set Theory.*

20:30-22:30
Athenian Early Evening Symposium (includes in order of appearance: continuous academic discussions, dinner, wine/water, music)

Tuesday 2 July 2024

09:00-10:30 Session 5		
Session 5a **Moderator: Matthew Shi**, Assistant Professor, Chinese University of Hong Kong, Hong Kong.	**Session 5b** **Moderator: Joseph Zeira**, Emeritus Professor, The Hebrew University of Jerusalem, Israel.	**Session 5c** **Moderator: Mahsa Allahbakhshi**, Assistant Professor, Pontificia Universidad Católica de Chile, Chile.
1. **Pascal Ghazalian**, Professor, University of Lethbridge, Canada. ***Title**: The Effects of the Extended Market Size of Regional Trade Blocs on FDI Inflows: A Dynamic Panel Analysis.* 2. **Larry Qiu**, Professor, Lingnan University, Hong Kong. **Qing Liu**, Professor, Renmin University of China, China. **Stephen Yeaple**, Professor, Pennsylvania State University, USA. ***Title**: Learning to Export like China: From Processing Trade to Ordinary Trade.* 3. **Joydeb Sasmal**, Professor (Retired), Vidyasagar University, India. ***Title**: Structural Change, Growth and the Increasing Service Trade in Low- and Middle-Income Countries.* 4. **Karina Manrique Lopez**, Assistant Teacher, Francisco José de Caldas District University, Colombia. **Nicolas Marciales Parra**, Assistant Professor, University of Santo Tomas, Colombia. ***Title**: Analysis and*	1. **Michael MacColl**, Professor, Vancouver Island University, Canada. ***Title**: Re-Thinking Strategy Formulation.* 2. **Jason Moschella**, Assistant Professor, HEC Montreal, Canada. ***Title**: Do Insiders Follow their Competitors' Trades?* 3. **Peter Tingling**, Associate Professor, Beedie School of Business – Simon Fraser University, Canada. **Kamal Masri**, Senior Lecturer, Beedie School of Business – Simon Fraser University, Canada. **Stephen Spector**, PhD Student, Beedie School of Business – Simon Fraser University, Canada. ***Title**: Covid Asymmetry – Hardly an Ill Wind.* 4. **Chux Gervase Iwu**, Professor, University of the Western Cape, South Africa. ***Title**: Gendering [Female] Entrepreneurship Conversations –*	1. **Fawzi Benmessaoud**, AI Program Director, Indiana University – Purdue University Indianapolis, USA. **Mohamed Habib Agrebi**, Researcher, Indiana University – Purdue University Indianapolis, USA. ***Title**: FazBoard: An AI-Educational Hybrid Intelligent Teaching & Learning System.* 2. **Evangelos Xevelonakis**, Head of Center for Data Science & Technology, HWZ University of Applied Science, Switzerland. ***Title**: Identifying Sustainability Efforts in Company's Reports Using Text Mining and Machine Learning.* 3. **Yun Zhou**, Associate Professor, National University of Defense Technology, China. ***Title:** CycleTTA: Continuous Cyclical Test Time Domain Adaptation.* 4. **Craig Teerlink**, Assistant Professor, VA Informatics and Computing Infrastructure, USA. ***Title**: Development of a Machine Learning Approach to Identify Veterans Carrying the V142I Variant in the US Veterans Administration Healthcare Network.* 5. **Thomas Fehlmann**, Senior Researcher, Euro Project Office AG, Switzerland. **Eberhard Kranich**, Senior Researcher, Euro Project Office AG, Switzerland. ***Title**: How to Teach Literacy to Artificial Neural Networks.*

Construction of Indicators for Public Investment in Colombia.	*Leadership, Power and Culture Conundrum.* 5. **Parbudyal Singh**, Professor, York University, Canada. ***Title**: Green Human Resource Management and Firm Performance.*	
10:30-12:00 Session 6		
Session 6a **Moderator: Byasdeb Dasgupta**, Professor, University of Kalyani, India.	**Session 6b** **Moderator: Jason Moschella**, Assistant Professor, HEC Montreal, Canada.	**Session 6c** **Moderator: Viktoria Taroudaki**, Associate Professor, Eastern Washington University, USA.
1. **Derek Brewin**, Professor and Head, Department of Agribusiness and Agricultural Economics, University of Manitoba, Canada. **Stavroula Malla**, Professor, University of Lethbridge, Canada. ***Title**: Assessing the Economic Benefits of Biotechnology in Canada.* 2. **Jorge Ivan Bula-Escobar**, Professor, National University of Colombia, Colombia. **Giovany Armando Astroz-Marin**, Master Student, Higher School of Public Administration, Colombia. ***Title**: The Bioeconomy as an Option for Economic Development.* 3. **Matthew Shi**, Assistant Professor, Chinese University of Hong Kong, Hong Kong. **Shuangda Wang**, PhD Student, Chinese University of Hong Kong, Hong Kong. ***Title**: Innovation or Imitation? Effects of Public Health Insurance on Pharmaceutical Development in China.* 4. **Lingyun Huang**, Professor, Chongqing University, China.	1. **Patrick Vyncke**, Full Professor, Ghent University, Belgium. ***Title**: Between the Central and the Peripheral Route: Investigating the Effectiveness of Communicative Nudging as a Third Advertising Strategy.* 2. **Lance Gentry**, Professor, University of Mary Washington, USA. ***Title**: Improving Text Survey Response Rates by Timing.* 3. **Ahmed Khalil Ben Ayed**, Assistant Professor, University of Ottawa, Canada. **Marc Alexandre Tomiuk**, Associate Professor, HEC Montréal, Canada. ***Title**: Service Encounter Toxicity and Role Maintenance: A Moderated Mediation Model of Perfectionistic Self-Presentation and Difficulty to Maintain Display Rules.*	1. **Aleksandra Kostic**, Full Professor, University of Sarajevo, Bosnia and Herzegovina. **Valentina Timotic**, Assistant Professor, University of Sarajevo, Bosnia and Herzegovina. **Izet Horman**, Full Professor, University of Sarajevo, Bosnia and Herzegovina. ***Title**: Improving Variational Characterization Interval Bounds to Gyroscopic Problems.* 2. **Carmelo Raffaele Cartiere**, Head of Research and Development, Division of Quantitative Physics and Systems Engineering, Kellogg College, University of Oxford, UK. ***Title**: An Analytical Study of Diophantine Equations of Pythagorean Form.* 3. **Michael Hecht**, Visiting Professor / Research Group Leader, CASUS / HZDR, Germany. ***Title**: Fast Multivariate Newton Interpolation for Downward Closed Polynomial Spaces.* 4. **Karl Javorszky**, Retired, Austria. ***Title**: Update on a+b=c.*

Yanjun Zou, PhD Student, Chongqing University, China. ***Title**: The Inequality Effect of Industrial Robots: Evidence from Working Hours.*		
12:00-13:30 Session 7		
Session 7a **Moderator: Larry Qiu**, Professor, Lingnan University, Hong Kong.	**Session 7b** **Moderator: Cleopatra Veloutsou**, Head, Marketing Unit, The Athens Institute & Professor of Brand Management, University of Glasgow, UK.	**Session 7c** **Moderator: Karl Javorszky**, Retired, Austria.
1. **Byasdeb Dasgupta**, Professor, University of Kalyani, India. ***Title**: Wage Productivity Gap and Labour Market Flexibility: A Study based on Indian Manufacturing Industries during 1973-2020.* 2. **Nurhan Hande Sevgi**, Assistant Professor, Ufuk University, Türkiye. ***Title**: Interest Rate and Inflation Relationship-Fisher Hypothesis: Definition of The Inflation Basket.* 3. **Hemmat Safwat**, Director, Energy Consultant, Greece. ***Title**: How Close are Macro-Economics/Macro-Thermodynamics? The Knowledge & Energy Pair Economies in the Net Zero Era.* 4. **Bruno Fiesenig**, PhD Student and Research Assistant, Technical University of	1. **YuPei Chang**, Professor, National Yang Ming Chiao Tung University, Taiwan. ***Title**: Marketing Strategies for Digital Games in the Globalized Market.* 2. **Abdulelah Abed Althagafi**, Assistant Professor, The University of Business and Technology, Saudi Arabia. ***Title**: Critical Comparison of Social Media Marketing Technologies in HE of Saudia Arabia and Scotland for International Student Recruitment.* 3. **Sandra Miranda**, Lecturer, Lisbon College of Communication, Polytechnic Institute of Lisbon, Portugal. ***Title**: Exploring Motivations and Preferences in Digital Influencer Engagement among American and Portuguese Higher School Students.*	1. **Philip Slobodsky**, Director, Halomda Educational Software, Israel. **Mariana Durcheva**, Lecturer, Sami Shamoon College of Engineering, Israel. **Leonid Kugel**, Lecturer, Kaye College of Education, Israel. ***Title**: If you Can't Beat It, Join It! Teaching and Learning Mathematics with ChatGPT and Key Prompts to Stimulate Self-Learning.* 2. **Yenting Lai**, PhD Student, Chung Hua University, Taiwan. **Erh-Tsung Chin**, Professor, Chung Hua University, Taiwan. ***Title**: A Case Study of Rural Teachers Developing Bilingual Mathematics Teaching through a Teacher Professional Learning Community.* 3. **Weng Sung-Huan**, PhD Candidate, Chung Hua University, Taiwan. **Erh-Tsung Chin**, Professor, Chung Hua University, Taiwan. ***Title**: The Development of Ethno-mathematics Teaching Activity Design Based on Bunun (a Taiwan Indigenous Tribe) Traditional Weaving.* 4. **Chia-Hao Tsai**, PhD Candidate, Chung Hua University, Taiwan. **Erh-Tsung Chin**, Professor, Chung Hua University, Taiwan. ***Title**: A Study on the Feasibility of Establishing a Teacher Professional Learning Network through the Implementation of On-line Public*

Darmstadt, Germany. ***Title**: Unicorn Valuation Post IPO: An Empirical Analysis.*		*Lesson Mode.*

13:30-14:30 Lunch

14:30-16:30 Session 8

Session 8a **Moderator: Hemmat Safwat**, Director, Energy Consultant, Greece.	**Session 8b** **Moderator: Seren Yashar**, AI Governance Lead, Independent, Greece.
1. **Gulem Atabay**, Full Professor, Izmir University of Economics, Türkiye. ***Title**: The Role of Interprofessional Education on Positive Attitude Development: An Experimental Study on Nursing and Medical Students.* 2. **Jeremy Swanston**, Associate Professor, University of Iowa, USA. ***Title**: Centering Community Voices in Design: Project PEER.* 3. **Radka Leskova**, Assistant Professor and Researcher, University of Economics in Bratislava, Slovakia. ***Title**: Sustainability Assessment and the Importance of Environmental Indexes for Companies Operating in Slovakia.* 4. **Ricardo Teixeira Veiga**, Full Professor, Federal University of Minas Gerais, Brazil. **Márcio Augusto Gonçalves**, Full Professor, Federal University of Minas Gerais, Brazil. **André Torres Urdan**, Full Professor, UNINOVE, Brazil. **Celso Augusto de Matos**, Assistant Professor, University of Lisbon, Portugal. ***Title**: Building Sustainable Business Models through a Hierarchical Ethical Approach and S-D Logic.* 5. **Panagiotis Anastasopoulos**, Associate Professor, University at Buffalo, USA. ***Title**: Using Statistical and Econometric Modeling to Enhance Predictive Machine Learning in Transportation Safety Research: A Theoretical Framework.* 6. **Irina Rodriguez De La Flor**, Researcher and CEO IMI, University of Alcalá, Spain. ***Title**: Inner Management and a Possible New Type of Human Intelligence.*	1. **Catalin Silviu Nutu**, Associate Professor, Constanta Maritime University, Romania. ***Title**: Decrypting Evolutionary Fractals using Intelligence Models based on the CSN Matrix.* 2. **Sahika Gokmen**, Associate Professor, Ankara Hacı Bayram Veli University, Türkiye. ***Title**: An Early-Warning System Against Violence for Woman: Türkiye Example.* 3. **Mariana Durcheva**, Lecturer, Sami Shamoon College of Engineering, Israel. ***Title**: Tropical Cryptography – The State of The Art and Future Prospects.* 4. **Nemanja Milenkovic**, Assistant Professor, University of Belgrade, Serbia. ***Title**: A Novel Approach in Multivariate Outlier Detection.* 5. **Babhrubahan Bose**, Research Assistant, Indian Institute of Science, Bengaluru, India. ***Title**: Pointwise Symmetry of Birkhoff-James Orthogonality and Geometry*

	of $\mathbb{B}(\ell_n^\infty, \ell_m^1)$

17:00-20:00 Session 9
Old and New-An Educational Urban Walk

The urban walk ticket is not included as part of your registration fee. It includes transportation costs and the cost to enter the Parthenon and the other monuments on the Acropolis Hill. The urban walk tour includes the broader area of Athens. Among other sites, it includes: Zappion, Syntagma Square, Temple of Olympian Zeus, Ancient Roman Agora and on Acropolis Hill: the Propylaea, the Temple of Athena Nike, the Erechtheion, and the Parthenon. The program of the tour may be adjusted, if there is a need beyond our control. This is a private event organized by ATINER exclusively for the conference participants.

20:30-22:00
Dinner

Wednesday 3 July 2024
An Educational Visit to Selected Islands
or Mycenae Visit

Thursday 4 July 2024
Visiting the Oracle of Delphi

Friday 5 July 2024
Visiting the Ancient Corinth and Cape Sounion

Mahsa Allahbakhshi
Assistant Professor, Pontificia Universidad Católica de Chile, Chile

Pedagogical Innovation to Enhance Mathematical Learning and Cross-Disciplinary Skills in Incoming Mathematics Faculty Students

This paper explores the implementation of active and self-regulated learning strategies within a workshop-course designed for first semester Bachelor of Mathematics students and those in Secondary education math teacher students at the Pontificia Universidad Católica de Chile. The course integrates three mandatory theoretical courses, with the aim of equipping university students with essential academic and interpersonal skills. The paper details various active learning strategies identified in literature and discusses the integration of selected approaches that collectively create a conducive learning environment. These strategies are focused on enhancing mathematical knowledge, as well as fostering communication and collaboration skills among students.

A significant aspect of this educational approach is the emphasis on high-quality and rigorous pedagogical standards. Such standards have been instrumental in increasing student motivation and their capacity to address complex mathematical challenges. This approach not only facilitates a seamless transition into university academics but also ensures the development of critical skills like communication and mathematical reasoning. Additionally, the course design pays particular attention to deepening the students' understanding of the cognitive, emotional, and social factors that influence their learning, interactions, and teamwork abilities in mathematical contexts.

To realize these educational objectives, the paper describes a comprehensive framework used in both the design and implementation of the course's strategies. This includes the development of instructional guides for students and teaching-assistants, the creation of collaborative pedagogical activities, and the production of multimedia content for asynchronous learning. The evaluation of this educational model involved a range of methods, including individual interviews, focus groups, and self-assessment questionnaires. A notable feature of the evaluation was the analysis of video recordings from classroom sessions, which provided insights into the active collaboration and dynamic interactions among student groups.

The paper emphasizes that the adoption of an integrated approach has been crucial in meeting the course objectives. This methodology has

not only helped in achieving the desired learning outcomes but also contributed to the ongoing improvement and refinement of the educational process. The results and insights from this study offer valuable contributions to the field of mathematics education, particularly in the context of transition to higher education, and highlight the effectiveness of active learning strategies in enhancing student engagement and learning outcomes.

Medhat Alsafadi
Assistant Professor, Lewis University, USA
&
Apostolos Xanthopoulos
Assistant Professor, Lewis University, USA

Outperformance versus Due Diligence: Which Produces Investment Winners?

J48, is a machine learning algorithm that can produce rules based on the changes in estimated entropy. Investment consultants, on the other hand, are seasoned professionals, who perform due diligence on portfolio managers and their strategy of allocating institutional investor funds among asset classes. Their official ratings or recommendations, issued on tens of thousands of universes of strategies, imply 'rules' for retiree funds' sloshing around among investment management firms. In this sort of 'chess game' can pure outperformance result in better recommendations than the human advisor? If true, what does that imply for the symbiotic functioning of investment managers with the consulting industry, its regulation, and its effect on financial markets? Fiduciary responsibility is not strictly imposed by the U.S. regulatory authorities. I collect five years of monthly returns for about a thousand known investment strategies, as well as their Morningstar ratings. With the first three years of data, together with the ratings assigned by Morningstar, I estimate the probability of outperformance and the coefficients of strategies to eight less-correlated benchmarks. J48 and maximum entropy based on these coefficients implies one set of rules based on outperformance, and another set based on the ratings assigned through due diligence. For the last two years of data, I apply each set of rules and then measure the value of the final portfolio of strategies. Based on a conjecture that investment advisor activity mainly aims at increasing their own wealth, I expect the outperformance rules should beat the due-diligence based rules. The difference in the values of the two portfolios in two years, should provide an estimate of rent-seeking by consultants.

Abdulelah Abed Althagafi
Assistant Professor, The University of Business and Technology, Saudi Arabia

Critical Comparison of Social Media Marketing Technologies in HE of Saudia Arabia and Scotland for International Student Recruitment

This research aims to explore the extent to which social media is used in Higher Education to formulate and implement social media marketing strategies. The research undertakes a structured comparison of the social media use for international student recruitment of Saudi Arabian universities versus universities in Scotland to discover the extent to which social media is deployed for international student recruitment. A review is conducted of published work on digital marketing frameworks in Higher Education. This is followed by an online content analysis of social media marketing content on digital platforms such as Instagram, Twitter, and Facebook. The outcome of the research proposes a comparison of social media marketing strategies used by Saudi Arabian vs Scottish universities.

Panagiotis Anastasopoulos
Associate Professor, University at Buffalo, USA

Using Statistical and Econometric Modeling to Enhance Predictive Machine Learning in Transportation Safety Research: A Theoretical Framework

Deep learning, a subset of machine learning utilizing multi-layered artificial neural networks, extracts patterns from large datasets by hierarchically learning data representations, akin to the human brain. While demonstrating significant potential across various domains, its efficacy in transportation safety research remains inconclusive due to challenges posed by its black-box nature and by underlying unobserved heterogeneity. Conversely, statistical and econometric modeling offers robust techniques for managing uncertainty, by identifying influential factors associated with forecasting accuracy. This study presents the framework of a novel approach that fuses statistical modeling with deep learning in transportation safety. Three experiments are designed to investigate the efficacy of this joint application: evaluating deep learning predictions through statistical modeling; exploring whether significant safety factors can inform the training of the neural network; and assessing performance enhancement through their combined application. This integration aims to empower machine learning in transportation safety research, shedding light on the complementary strengths of statistical/econometric and deep learning techniques, and offering insights for accident prediction improvement and safety research advancement.

Nemanja Antic
Associate Professor, Northwestern University, USA

Selected Facts

NOT AVAILABLE

Gulem Atabay
Full Professor, Izmir University of Economics, Türkiye
Burcu Peslikan
Graduate Student, Izmir University of Economics, Türkiye
&
Burcu Güneri Çangarlı
Full Professor, Izmir University of Economics, Türkiye

The Role of Interprofessional Education on Positive Attitude Development: An Experimental Study on Nursing and Medical Students

There is a growing awareness and initiative focused on enhancing collaboration and relationships among health professions, recognizing their pivotal role in improving healthcare services in terms of quality, workforce efficiency, and cost-effectiveness (Ateah et al., 2011; Lockeman et al., 2017). The establishment of positive interprofessional relationships and collaboration among health professions is significantly influenced by interactive experiences (Cruess et al., 2015). Among these interactive encounters, interprofessional education emerges as a notable initiative directed at nurturing collaboration and cultivating positive relationships within the realm of health professions. This paper explores how interprofessional education contributes to improving the collaborative relationship between nurses and physicians by cultivating positive attitudes. The study employed a pretest-posttest design involving 44 nursing and medical students. Data were gathered through both quantitative and qualitative methods. Students were organized into interprofessional teams and engaged in a six-week study involving visits to the homes of elderly individuals living alone. At the outset, participants completed a questionnaire covering demographic information and assessments of their attitudes towards each other's professions. The same questionnaire, with identical measures, was administered after the six-week study. The results revealed a significant increase in scores after the interprofessional education experience. Subsequent focus group interviews were conducted to gain deeper insights. The study highlights that interprofessional education can bring about a positive change in the attitudes of nursing and medical students towards each other's professions.

Ahmed Khalil Ben Ayed
Assistant Professor, University of Ottawa, Canada
&
Marc Alexandre Tomiuk
Associate Professor, HEC Montréal, Canada

Service Encounter Toxicity and Role Maintenance: A Moderated Mediation Model of Perfectionistic Self-Presentation and Difficulty to Maintain Display Rules

The societal mutations brought about by recent events such as the pandemic, inflation, and the advent of artificial intelligence have altered the relationships between companies and customers who no longer hold the same expectations. Specifically, service providers face increasingly demanding customers and front-line employees sometimes find themselves in the crosshairs of dissatisfied customers. This causes service interactions to become increasingly unpleasant, deviant, threatening and even harmful to service agents. In turn, this impairs service delivery and results in unscripted and unpleasant service experiences for both customers and service agents. Herein, we challenge the widespread assumption that compelling service agents to maintain their role at any cost, as long as the service encounter lasts, will improve service delivery. In fact, we posit that drawing solely on customer expectations to prescribe organizational norms and guidelines for service agents may not lead to satisfactory customer experiences. Moreover, doing so may prove toxic to service agents and lead to service failures. In Study 1, we fall back on appraisal theories of emotion to propose a multidimensional measure of service encounter toxicity which is subsequently tested and validated via exploratory and confirmatory factor analysis. Next, we draw on Conservation of Resources, Social Identity and Role Identity theories to delve into the mechanisms through which toxicity debilitates the ability of service agents to engage in emotional labor and to maintain their work-role identity as service agents. To do so, we examine the mediating effect of difficulty to maintain display rules on the relationship between service encounter toxicity and role maintenance via a structural equation model. In Study 2, we examine the moderating role of service agents' perfectionistic self-promotion (i.e., service agents' self-presentational efforts to create an image of being flawless during service encounters) in the mediated relationship between service encounter toxicity and role maintenance. Estimation of the moderated mediation model revealed that service agents characterized by higher levels of

perfectionistic self-promotion were more vulnerable to negative feedback and were more likely to sense difficulty to maintain display rules which, in turn, proved to be more disruptive for role maintenance. Furthermore, the negative indirect relationship between service encounter toxicity and role maintenance through difficulty to maintain display rules was stronger for employees with higher levels of perfectionistic self-promotion. This suggested that service agents characterized by higher levels of perfectionistic self-promotion were more vulnerable to psychological stress induced by service encounter toxicity. Finally, we conclude that a customer's experience is not solely shaped by the implementation of rules and quality standards which aim to satisfy customer expectations but that it also depends on the employee's experience. This implies a form of co-creation which is inherent to services marketing because services are actually produced and consumed simultaneously. In sum, we contend that service organizations should ground value creation on the quality of the social exchanges between customers and the service agents rather than exclusively focusing on customer expectations.

Fawzi Benmessaoud
AI Program Director, Indiana University - Purdue University Indianapolis, USA
&
Mohamed Habib Agrebi
Researcher, Indiana University - Purdue University Indianapolis, USA

FazBoard: An AI-Educational Hybrid Intelligent Teaching & Learning System

FazBoard, an avant-garde educational platform, seamlessly integrates artificial intelligence with contemporary educational methodologies to foster a dynamic, adaptive, and collaborative learning ecosystem. The platform's linchpin comprises two components: an agile digital canvas that simulates interactive teaching and learning spaces, and an AI Assistant, incarnated as a digital humanoid, available round-the-clock for responsive academic support. The digital canvas is designed to cultivate an immersive and versatile environment, emulating the interactions of traditional classrooms without the constraints of time or location. The AI Assistant excels in providing instantaneous responses to queries, aggregating valuable learning analytics, and streamlining administrative tasks - all of which contribute to curriculum refinement and enhanced pedagogical efficacy. Furthermore, FazBoard is aimed at bolstering student engagement by creating an inclusive learning milieu, through adaptive learning strategies that cater to the diverse educational needs of its users. This paper delves into the architecture, functionalities, and far-reaching applications of FazBoard, heralding it as a quintessential model of integrating AI into education, thereby shaping the trajectory of 21st-century educational practices.

Babhrubahan Bose
Research Assistant, Indian Institute of Science, Bengaluru, India

Pointwise Symmetry of Birkhoff-James Orthogonality and Geometry of $\mathbb{B}(\boldsymbol{\ell_n^\infty}, \boldsymbol{\ell_m^1})$

We study the relationship between the point-wise symmetry of Birkhoff-James orthogonality and the geometry of the space of operators $\mathbb{B}(\ell_n^\infty, \ell_m^1)$. We show that any non-zero left-symmetric point in this space is a smooth point. We also show that for $n \geq 4$, any unit norm right-symmetric point of this space is an extreme point of the closed unit ball. This marks the first step towards characterizing the extreme points of these unit balls and finding the Grothendieck constants $G(m, n)$ using Birkhoff-James orthogonality techniques.

Derek Brewin
Professor and Head, Department of Agribusiness and Agricultural Economics, University of Manitoba, Canada
&
Stavroula Malla
Professor, University of Lethbridge, Canada

Assessing the Economic Benefits of Biotechnology in Canada

Investment in research has been a key determinant of economic growth at the national level with high rate of returns. During the 20th century, most crop research was undertaken by public institutions and the products of that research were held in the public domain. The introduction of modern biotechnology and improved Intellectual Property Rights (IPRs) has conferred monopolistic rights to the inventor, leading to increased private investment in agricultural research, which in turn resulted in a concentrated privatized industry. These changes are particularly apparent in the Canadian canola sector that has been transformed from a minor to a major crop over the last four decades and the canola industry has experienced significant growth. It is imperative to keep improving productivity and economic growth through innovation in all economic sectors, especially agriculture.

The agriculture sector around the world faces some major challenges regarding food security, how to sustainably balance future supply and demand at a time of constrained research budgets, increasing pressures from population growth, changing consumption patterns and dietary preferences, post-harvest losses, climate change, loss in ecosystem biodiversity, and demands for the use of biomass to provide additional renewables. While the global population is expected to grow significantly in the next few decades, it has been shown that agricultural productivity growth has slowed, especially in the world's richest countries attribute the global productivity slowdown to underinvestment in certain types of productivity-enhancing agricultural R&D (Research & Development). It is vital that the policies and regulations in place be assessed to ensure further growth in the sector. There is compelling evidence that investment in agricultural research, biotechnology in particular, could contribute to sustainable development, with benefits to producers, consumers, the environment, and the economy. However, policies and regulations must be designed to foster the investment needed.

The goal of this study is to examine the returns to agricultural research in a privatized biotech canola industry in Canada considering health and production externalities, climate change, and food security. The study is very timely given the climate change and food security concerns. Additionally, the study will estimate the distributional impact of changing intellectual property rights and funding sources of agricultural research, as well as the spillovers and externalities in agricultural research. Lastly, it will examine the implications of the results for the formulation of research policy and how alternative policies could enhance overall research productivity and economic growth.

Gordon Brooks
Professor, Ohio University, USA
&
Nina Adjanin
Assistant Professor, Northwest Missouri State University, USA

Using Human-Friendly Scheffé Comparisons to Explore Group Differences in One-way ANOVA

Applied researchers are familiar with multiple comparison procedures (MCPs) used to explore group mean comparisons following a statistically significant one-way ANOVA or main effect in factorial ANOVA. Commonly used MCPs include pairwise comparison techniques like Tukey-Kramer and Games-Howell. Relatively few researchers use the Scheffé method because it is well-known to lack the statistical power of other MCPs for the pairwise post hoc comparisons that most researchers use—and most statistics programs provide.

The Scheffé MCP has lower power because it adjusts for all possible comparisons: all pairwise and non-pairwise comparisons. However, only Scheffé MCP guarantees the congruence to find a statistically significant comparison whenever the omnibus or main-effect ANOVA is statistically significant—and conversely, not find one when ANOVA is not significant. That is, a maximum Scheffé comparison can be calculated that provides the set of contrast coefficients for the means that maximally differentiates some combination of groups on the dependent variable. This maximum comparison has the same statistical significance as the omnibus Fisher *F* ANOVA and is usually a non-pairwise (also called complex) comparison.

Unfortunately, coefficient weights from this maximum Scheffé comparison are often uninterpretable or meaningless from a practical or theoretical perspective. Therefore, Barcikowski (personal communication, 2000) suggested a method by which a researcher can identify the maximum "human-friendly" comparison that serves to approximate the Scheffé maximum comparison with coefficients that are reasonably interpretable. That is, Barcikowski's approach identifies and tests all possible comparisons that use "reasonable" ways to compare complex combinations of groups. For example, one acceptable reasonable comparison would be the Helmert-type contrast that compares a control group with the average of multiple treatment groups. Similarly, another example would be the comparison of the average of two control groups with the average of two treatment groups. Barcikowski's method will identify the maximum comparison from among all

possible reasonable Scheffé-like comparisons and will also identify all statistically significant complex comparisons that have interpretable coefficients.

We believe researchers may be missing potentially useful exploratory information by not examining the maximum Scheffé or Barcikowski comparisons. Our primary purpose in the presentation is to demonstrate the use of the new R Shiny web app to obtain (a) the Scheffé maximum comparison, (b) the maximum Barcikowski "human-friendly" comparison, as well as all the statistically significant Barcikowski comparisons, and (c) the relatively unknown Brown-Forsythe adjustment to the Scheffé MCP for when the equal variances assumption is not met. We will also share some of our research that supports the use of Barcikowski contrasts, especially examples from a review of recent education literature that might have benefited from use of the Scheffé maximum comparisons and Barcikowski comparisons.

Elizabeth Bucacos
Researcher, Central Bank of Uruguay, Uruguay

Labor Market Slack and Monetary Policy in an Emerging Economy: A Gender Approach

The purpose of this article is to assess the interrelationship between the monetary policy and the labor market in an emerging economy. While pursuing price stability, unemployment rises and women are hurt more. Efficient coordination with other economic policies – e.g., fiscal policy, employment strategies – is needed when contractionary monetary policy is at work. However, dollarization, by weakening monetary policy power, ameliorates those negative drawbacks.

Jorge Ivan Bula-Escobar
Professor, National University of Colombia, Colombia
&
Giovany Armando Astroz-Marin
Graduate Student, Higher School of Public Administration, Colombia

The Bioeconomy as an Option for Economic Development

The concept of economic development has known many different perspectives and definitions. At the mid-20th century, it was assimilated to the idea of economic growth, the growth of the GDP. Later, social aspects as poverty, inequality, and unemployment reduction, were introduced as dimensions of economic development. Nowadays this concept has migrated to the idea of development as a freedom (A. Sen) and, even more, human sustainable development.

During the 21st century, the international community has been seeking to generate a consensus around the idea of development, first with the millennium development goals and, subsequently, with the sustainable development goals. From such a perspective, a concept introduced in the 1970s by Nicholas Georgescu-Roegen, has gained momentum, this is the idea of bio-economics. Georgescu-Roegen defined in 1975, bioeconomy as:

The term [bioeconomy] is intended to continually remind us of the biological origin of the economic process and thus highlight the problem of humanity's existence with a limited amount of accessible, unequally located, and appropriated resources.

Many of the elements considered by this author as a bioeconomic programme are present in the SDG adopted by the UN Assembly in 2015 (seven of eight following ECLAC). This paper looks at the assessment of the adoption of the bioeconomic perspective as the basis for thinking about how both developing and developed countries need to redirect their development strategies in order to aligned to the SDG, but even more important, as a way to face climate change, as far as bioeconomy may be a conceptual framework for the development of policies related to major social challenges and sustainable development. Starting from the 2030 Agenda, the bioeconomy, having biological resources as its material base, is an alternative for the intelligent specialization of territories, for innovation and structural change with a focus on sustainability, as well as to promote agricultural and rural development policies among others. As stated by ECLAC (2018), the bioeconomy is a strategy for growth with the decoupling of emissions and transition to a post-fossil resources economy.

Also, as suggested by Bugge et al. (2016), this paper will consider the three kinds of understandings of biocoenomics that they underline as part of the analysis: the vision of biotechnology, the vision of bioresources and, a bioecological vision for a more holistic view on economic development.

Finaly, the idea is to present a framework that may enhance the concept of development based on the idea of the bioeconomy as a more structured perspective on economic development considered as a human sustainable development.

Carmelo Raffaele Cartiere
Head of Research and Development, Division of Quantitative Physics and Systems Engineering, Kellogg College, University of Oxford, UK

An Analytical Study of Diophantine Equations of Pythagorean Form

In XVII century, presumably between 1637 and 1638, in a marginal note of Diophantus' "Arithmetica", Pierre de Fermat claimed that Diophantine equations of the Pythagorean form (or, $x^n + y^n = z^n$) have no integer solutions for $n > 2$, and $x, y, z > 0$. Of this statement, however, Fermat never provided a proof. Only after more than 350 years, in 1994, Prof. Andrew J. Wiles was finally successful in demonstrating it. However, Wiles' proof adopts such advanced calculus techniques that they could never have been in the background of Fermat's knowledge.

In this work, our aim is to establish an analytical method to attempt a proof of Fermat's Last Theorem using solely elementary calculus techniques. Our methodology unfolds as a step-by-step process, mathematically robust, transparent, and comprehensible to a broader audience, ultimately leading to the rigorous confirmation of Fermat's Last Theorem.

YuPei Chang
Professor, National Yang Ming Chiao Tung University, Taiwan

Marketing Strategies for Digital Games in the Globalized Market

With the flourishing development of the global media industry, digital games have emerged as a new form of media in the globalized market, influencing people's media consumption habits and daily lifestyles. As a cultural product within the entertainment industry, although digital games incur substantial production costs, their ability for extensive replication and cross-territorial distribution makes them one of the representatives in today's global media industry.

Taiwan is situated within the Asian digital gaming industry network. On one hand, it undertakes the localization and marketing of games produced in other countries. On the other hand, it also endeavors to conduct cross-border marketing for games produced domestically in Taiwan. This study focuses primarily on the digital gaming industry in Taiwan and explores marketing strategies for digital games in the context of a globalized market.

In terms of research methodology, this paper employs archival data analysis and in-depth interviews. Through archival data analysis, the paper collects documents such as Taiwan government policies related to the digital gaming industry, official websites of significant gaming companies in Taiwan, and major gaming community websites to depict the outline of the digital gaming industry. Additionally, this research visits 9 key publicly listed gaming companies in Taiwan and conducts interviews with representatives from these companies, including CEOs, executive assistants to CEOs, brand directors, project managers, assistant managers, and executives. The company visits and interviews aim to understand how these gaming companies operate as agents for games from other countries and how they promote their in-house games in the global market.

The research findings reveal that Taiwan's digital gaming industry plays a dual role as both a producer-exporter (game developers) and a recipient (game agents) in the global market. Under the conditions of globalization, marketing strategies for the digital gaming industry can be summarized in three points.

First, in terms of international marketing strategies, it is advisable to initiate a process of linguistic localization. Game companies will translate imported agent's game text, voiceovers, manuals, and

packaging into the local language, allowing players to receive cultural products from other countries without burden and in a relaxed manner.

Second, for international marketing strategies, content adjustments should be made based on user characteristics. Game companies adjust program designs according to the local user characteristics to cater to the preferences of local players. In other words, the same game released in different countries will have different game mechanics. For example, mainland Chinese players prefer fighting elements, so games released in China would enhance fighting functions. On the other hand, Taiwanese players prefer team cooperation, so games released in Taiwan would enhance cooperative features.

Third, for international marketing strategies, emphasis should be placed on local cultural customs. Game companies adjust aesthetics and content based on the cultural characteristics of the region of release. Taking racing games as an example, racing games in the United States need to feature car models and racers favored by the American population. However, if the same game is released in Europe, car models and racers would need to be adjusted according to European preferences. Additionally, game companies would also create special products based on the demands of local agents, such as adding elephant mounts for the Thai market or creating missions related to the Songkran Festival.

Xiaowen Chen
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The Threshold Effect of Digital Service Trade on Carbon Emissions in RCEP Countries

In the past few decades, with the development of regional economic integration as well as the commencement of the Regional Comprehensive Economic Partnership Agreement (RCEP), the digital economy has gradually begun to integrate with related fields such as international trade. Among them, digital service trade, represented by high-tech and low-emission service sectors, has great potential for driving carbon reduction. Facing the urgent carbon neutrality goal, determining whether digital service trade can be an effective way to achieve carbon reduction is the main purpose of the study. The study selects the panel data of 13 RCEP countries from 2005 to 2019, uses population size and energy intensity as the threshold variables, and combines the Environmental Kuznets Curve (EKC) with the panel threshold model to investigate the threshold effect of digital service trade on carbon emissions. The main conclusions are as follows. First, digital service trade has a double threshold effect with energy intensity as the threshold variable, and the lower the energy intensity, the more significant the effect of digital service trade on carbon emissions. Second, digital service trade has a single threshold effect on carbon emissions based on population size, and it is positively correlated with carbon emissions after the threshold is crossed. Finally, the level of economic development and carbon emissions of RCEP countries conform to the EKC hypothesis, but most countries are still in the rising stage of the curve. The paper provides a better understanding of the relationship between digital service trade and carbon emissions and offers theoretical support for RCEP countries to achieve the goal of carbon neutrality.

Dimitris Christodoulou
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Euclid Absent from the Standard Model of Particle Physics

It takes no more than Euclid's geometric means between the known quarks to derive empirically some 16 of the 19 free parameters of the Standard Model of particle physics. Quantum chromodynamics, supersymmetry, and their exotic variants are simply unable to accomplish such a feat. After a brief historical introduction of cosmological units (and ratios and rates), I will derive these 16 parameters from the quark geometric means that pervade our universe, the fine-structure constant, and Koide's constant. Then, I will close with the "dreadful" consequences.

Byasdeb Dasgupta
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Wage Productivity Gap and Labour Market Flexibility: A Study based on Indian Manufacturing Industries during 1973-2020

The present study is an attempt to analyse the wage-productivity gap in the Indian manufacturing industries during 1973-2020 along with a focus on labour market flexibility in recent time. The basic objective of the study is two-fold: (a) to assess the wage productivity gap in Indian manufacturing industry based on secondary data available from Annual Survey of Industries (ASI) and (b) to see whether the labour market flexibility at the same time period has any mutual association with the wage productivity gap in Indian manufacturing industry especially after the onset of the economic liberalization programme in 1991.

We measure the wage-productivity gap at the 3-digit level of the NIC classification of industry groups by regrouping them into divisions of industries in terms of (i) industrial growth rate, (ii) wage elasticity, (iii) real wage growth, (iv) labour productivity, (v) capital-labour ratio or capital intensity.

To find labour share we arrive at real wages to workers by deflating nominal wages to workers by the consumer price index for industrial workers and real net value added by deflating nominal value added by the wholesale price index for manufactured products. In our study we want to see if at the All-India level, labour share in the manufacturing industry groups has risen or fallen in connection to what happens to labour productivity on the one hand and what happens to the real wages on the other hand. In this connection we want to test the effect of industrial growth rates on real wages. Considering all the industries, variables and years together, we will perform some simple econometric tests in this study, keeping real wage as the dependent variable to examine and assess the influence of labour productivity on real wage. Next, we will carry out the econometric tests using the panel regression technique to gauge the influence of net fixed capital (KF), capital output ratio (KO) and capital labour ratio (KL) or capital intensity on labour productivity. Our econometric testing may indicate the status of influence of technological factors like capital intensity on labour productivity and also, on labour share in Indian manufacturing industries. Our study will help to understand the overall real scenario

of India's manufacturing industries and the conditions of labourers employed in that sector.

Also, we will make an attempt here to gauge if the result obtained in the first objective of the study regarding wage productivity gap went hand in hand with flexible labour regime. Our concern here is to explore whether the scenario of wage productivity nexus in Indian manufacturing industry especially during the post liberalization period is mutually associated with flexible labour regime. For this we will mainly draw from the secondary literature on labour market in India considering different types of labour flexibility. We will employ simple statistical tests to check the above mentioned mutual association. We will use ASI data for the post liberalization period to assess first the degree of contractualisation/casualization in Indian manufacturing industry and that we will take as a proxy for degree of flexible labour regime in the said sector. And then we will check the relationship between the flexible labour regime and wage productivity nexus in the Indian manufacturing especially during the post liberalization period.

Oksana Domina
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Marketing Development in Finland and Ukraine: Comparative Analysis

The development of marketing theory and practice in any country is evidence of its economic maturity and favorable prospects for growth. Marketing has undergone a long period of formation and today represents the dominant concept of business management. Moreover, the development of marketing theory increasingly occurs through real economic practice. Historically, marketing emerged as a reaction to the existing market situation, and thereinafter all stages of the development of marketing theory have been associated with qualitative market changes. Traditionally, marketing activities have been related to a sharp change in the ratio between aggregate demand and aggregate supply, the prime example being the upheavals caused by the technological revolution of the late 19th century, which qualitatively changed the material and technological basis of production. It is from this period that the need arose for a management concept that takes account not only of the internal factors of the entity concerned but also of factors of the external market environment. Today, the global theory and practice of marketing has undergone almost one hundred years of evolution and development.

In the context of our study, this development has been determined by two histories that began separately in different eras: the history of marketing in Finland and the history of marketing in Ukraine. These sovereign states differ markedly and have emerged from diverse backgrounds. In Ukraine, the history of marketing began during a period of market transformation and changes to the social order. By contrast, the development of the Finnish marketing industry was supported and endorsed with the reciprocal relationship between multiple key marketing practitioners and institutions.

The issue of the unified system of criteria for analysing the marketing development for countries with different historical, economic, and cultural backgrounds remains unexplored.

Mariana Durcheva
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Tropical Cryptography – The State of The Art and Future Prospects

H.S. Vandiver is credited with introducing the concept of semirings in 1934, although earlier examples of implicitly defined semirings can be traced back to research in ring ideal theory. Nevertheless, semirings remained unnoticed by mathematicians for a long time. It was not until 1961, when Marcel Schützenberger presented the concept of a weighted machine, that interest in semirings experienced a revival.

A *semiring* can be considered as the general algebra $(S, +, \cdot)$ with two binary associative operations: "+" and "·", such that the distribution law connects the semigroups $(S, +)$ and $(S, \cdot)$. We will use the term semiring in a narrower sense, namely to refer to cases where addition is commutative. Usually, a semiring is called *idempotent* if $a + a = a$ for all $a \in S$.

Tropical algebra, originally proposed by Cuningham-Green in the 1960s, introduced an innovative approach by replacing the field of real number $\mathbb{R}$ with the semifield $\mathbb{R}_{\max}$. The term *idempotent analysis* was later coined by Viktor Maslov in 1985. This theory offers a new perspective to transform many non-linear problems in the real number domain into linear ones using this new arithmetic. Since 1995, the field of tropical algebra has seen significant growth with numerous discoveries and diverse applications in areas such as control theory and optimization; phylogenetics; modeling cellular protein production; railroad planning…

D. Grigoriev and V. Shpilrain were the first to demonstrate the use of tropical semirings in public key cryptography in 2013. Since then, numerous tropical schemes have been proposed, incorporating various idempotent semirings. The most commonly used idempotent semirings for cryptographic purposes are: *min-plus semiring* (where the additional operation is min, a multiplicative - usual addition) and *max-plus semiring* (where the additional operation is max, a multiplicative - usual addition), while there are also schemes utilizing *max-time semiring* (the addition is max, the multiplication is usual multiplication) and *min-time semiring* (the addition is min, the multiplication is usual multiplication).

The main mathematical problems which provide the security of these schemes are: **the tropical discrete logarithm problem (tropical DLP); the tropical semigroup action problem (tropical SAP); the tropical semidirect product; the problem of solving a two-sided linear**

system in tropical semiring; factorization of tropical polynomial and finding the GCD of two tropical polynomials; the tropical matrix power function problem (tropical MPF).

In this work, we provide a review of existing tropical schemes, discuss the difficulty of the underlying problems, examinee existing attacks on these schemes, and explore the future prospects and directions for cryptography based on tropical semirings.

Thomas Fehlmann
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&
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How to Teach Literacy to Artificial Neural Networks

Kausalai Wijekumar, a professor at Texas A&M University, USA, and his team gave a talk at the 26th Annual International Conference on Education, 20-23 May 2024, collocated with Computer Science, on how to teach children to gain literacy by reading. This turned out to be an excellent tutorial on how to make an artificial neural network intelligent.

Our organization is currently building a collection of designs for AI-enabled intelligent systems with self-learning capabilities. Using Wijekumar's work as inspiration, this talk will explain how such autonomous learning works, and present the state of the collection project. Unlike traditional deep learning, our collection of intelligent system designs can fine-tune themselves without the help of knowledge engineers who prepare an appropriate training set.

But what does literacy mean in AI? Generative AI, especially Large Language Models (LLM), use statistical relevance to build responses to prompts. Literacy in education means understanding cause and effect from a text and why one observation follows another. It has to do with the real world and some understanding of how the grounding behaves and works. This kind of learning can be achieved with intelligent systems that combine AI engines with traditional programming, or in terms of the graph model of combinatorial logic: Observations and Concepts with Lambda Concepts.

In conclusion, it is very helpful to listen to other disciplines for making AI intelligent. Such a list of AI engineers includes, but is not limited to, education and teaching to children and humans.

Bruno Fiesenig
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Unicorn Valuation Post IPO: An Empirical Analysis

This study compares the market enterprise value of former unicorns to 14 individual calculated enterprise values based on both the corresponding discounted cash flows and comparable company analyses. The purpose of this research is to investigate whether investors correctly perceive the valuation of unicorns. For our sample of 63 former unicorns entering capital markets between 2004 and 2019, we found that former unicorns appear to be undervalued in capital markets. Furthermore, we show that the accuracy of firm valuations increases with the amount of public information. Finally, we argue that extrinsic valuation methods provide a better approximation of a unicorn's value once public.

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Impact of Institutional Barriers on International Marketing of Healthcare Services: Elekta in the Emerging Market of South Africa

Dealing with healthcare is a complex phenomenon due to the involvement of patients, concern about life situations and interactions between people and firms in the service delivery process. The marketing of healthcare is complex in the emerging markets because of institutional barriers and the influence of cultural context. This study explores the impact of institutional constraints on the process of healthcare services marketing in South Africa. We conducted a case study on Elekta, a Swedish subsidiary company in South Africa, with 23 employees in 2022/23, by using interviews, direct observation and company documents. Elekta is a Swedish Multinational Company (MNC) in cancer treatment and the largest supplier in emerging markets. Two research questions are addressed: What institutional limits healthcare service providers meet in the emerging market of South Africa? How do they deal with institutional constraints to develop networks and marketing strategy? We analyze the role of formal and informal institutional constraints and how the service provider deals with it by developing network and trust in the local market. The findings show that for international marketing of healthcare services it is essential to follow local rules and regulations to be able to develop relationships with authorities and local bureaucracy. It is important to standardize the offering and offer the same quality of service as in developed countries.

Relationships with academic hospitals and local customers, offering access to professional experience world-wide, and know-how, impact trust development. Establishing relationships with complementary firms, use of local expertise, adaptation to local institutional arrangements, helping for planning of the service and offering cheap high-quality solutions are vital for network development and

marketing of healthcare services in an emerging market. To our knowledge, no study has focused on institutional barriers and the context in regards with healthcare practices in emerging markets. This study fills this gap and makes the following contributions: (1) extends institutional theory by linking infrastructure factors with network theory, trust development and marketing strategy, (2) applies a process perspective focusing on the practice of healthcare in an emerging market and (3) explores emerging market context in relation to a sensitive and relevant area of cancer services marketing. The following issues are highlighted:

1) Public organisations, as market actors and their stake of equal distribution of healthcare treatment to all people that need it, impact and contribute to the construction of networks and marketing strategy in the healthcare market.

2) The actors in the social arena where the issue of public healthcare is discussed interrelate with the healthcare service providing firm and its competitors to power position themselves in the healthcare market.

3) To succeed with marketing in the emerging market of South Africa marketers must deal with institutional barriers, construct networks with the institutions of public organisations, contribute to same quality treatment as in advanced markets and help to form and expand the boundaries of cancer market.

Lance Gentry
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Improving Text Survey Response Rates by Timing

Can a researcher improve survey response rates by sending invitations on a certain day of the week? What about by sending at a certain time of day? Text survey response rates were tested by the day of the week and time of the day. Three groups of texts were sent for six days in a row (Monday through Saturday) to unique phone numbers to Midwestern United States phone numbers. Texts were sent at three different times each day (mid-morning, mid-afternoon, and late evening). Results indicate that some days and times generate higher response rates than others.

Pascal Ghazalian
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The Effects of the Extended Market Size of Regional Trade Blocs on FDI Inflows: A Dynamic Panel Analysis

Foreign Direct Investment (FDI) often generates favourable effects for the economies of recipient countries. These effects are particularly important for developing regions, which tend to benefit from FDI-induced capital formation, knowledge and technology spillovers, and employment creation, *inter alia*. FDI inflows are typically determined by conventional factors such as economic development level, international trade and foreign investment openness, and political and macroeconomic conditions. FDI inflows could also respond to regionalization, inducing multinational enterprises (MNEs) to raise their foreign investments to benefit from the Extended Market Size (EMS) of Regional Trade Blocs (RTBs). In this context, the elimination/reduction of trade barriers among member countries of RTBs would facilitate business operations of MNEs' foreign affiliates, and it would enhance the realization of economies of scale and scope. This paper examines the short-run and long-run effects of the EMS of RTBs on FDI inflows. The empirical analysis is conducted through the one-step and two-step Generalized Method of Moments (GMM) System estimators for dynamic panel models. The benchmark empirical results show that the EMS of RTBs has positive effects on FDI inflows to member countries. Further investigation reveals that the significance of the EMS on FDI inflows has moderately increased over time, and that there is significant heterogeneity in the EMS effects on FDI inflows across RTBs. For instance, the EMS effects are found to be relatively large in the cases of the European Union (EU), Canada-United States-Mexico Agreement (CUSMA), and Association of Southeast Asian Nations (ASEAN), moderate in the cases of Southern Common Market (MERCOSUR), and Central European Free Trade Agreement (CEFTA), and relatively small/insignificant in the cases of RTBs in Sub-Saharan Africa (SSA) [*e.g.*, Economic Community of West African States (ECOWAS); Southern African Development Community (SADC)], and Commonwealth of Independent States Free Trade Area (CISFTA). Supplementary economic analysis disentangles the heterogeneous EMS effects on FDI inflows across RTBs. The corresponding results reveal the significance of the integration level of RTBs and the pertinence of economic development, international trade and foreign investment openness, and political conditions in determining the magnitude of the EMS effects on

FDI inflows. These findings underline the requirement for deeper regional economic integration, economic liberalization policies, and political stability to realize the favourable EMS effects of RTBs on the inflows of FDI.

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An Early-Warning System against Violence for Woman: Türkiye Example

In this research, we want to suggest an early warning system for violence against woman in Turkiye. The violence against woman has been an important topic of scientific literature for many countries. WHO and the similar organizations take into consideration this issue as it affects the social form of the society both on today and in the future. In the literature, it is possible to encounter with lots of factors that affect the violence against woman by intimate partner; partner's behavioral attitudes, economic factors, education level, family structure, living area etc. Even each country has own a protection system for woman who faces with violence. It has been realized from the related literature that an early warning system has not been researched yet. However, having this kind of an early warning system may help to reach woman under risk even they do not realize the situation and/or organize education programs for woman under certain circumstances. In this case, it is believed that this research may increase the benefit of education and/or protection applications as it focuses on the woman under specific conditions through an early warning system. For this motivation, firstly the factors effect violence against woman is investigated by the statistical tools and secondly is defined an early warning system depending on the related tools in this research.

Michael Hecht
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Fast Multivariate Newton Interpolation for Downward Closed Polynomial Spaces

We introduce a fast Newton interpolation algorithm of runtime complexity O(Nn), where N denotes the dimension of the underlying downward closed polynomial space and n its lp-degree, p >1. We demonstrate the algorithm to reach the optimal geometric approximation rate for analytic Bos-Levenberg-Trefethen functions in the hypercube, in which case the Euclidean degree, p=2, turns out to be the pivotal choice for resisting the curse of dimensionality. The spectral differentiation matrices in Newton basis are sparse, which enables realizing fast pseudo-spectral methods on flat spaces, polygonal domains, and regular manifolds. In particular, we discuss applications for high-dimensional PDEs and reaction diffusion systems on surfaces.

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Bargaining in the Labor Market

This paper introduces and validates a new survey tool to measure firms' wage bargaining strategies. Using the strategies we elicited for 772 German firms, we document that firms that do and do not individually bargain over wages are similar in productivity and size. However, firms' strategies systematically differ across groups of workers. We collect survey data from more than 10,000 workers to describe how bargaining events typically unfold. Many events consist of several rounds of back-and-forth negotiation and begin with workers providing their salary expectations. Most offers are rejected. High AKM person-effect individuals, less riskaverse individuals, and men are more likely to provide their expectations and to negotiate after an initial offer is made. These differences translate into sizable wage gaps at firms where pay is set by bargaining.

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The Time-varying Impact of Monetary Policy Shocks on the Cryptocurrency Uncertainty Indices

This study examines the impact of monetary policy shocks on cryptocurrency policy and price uncertainties. Based on the TVP-VAR model, the period from January 2014 to December 2022 is analyzed to investigate the effects of monetary policy shocks. The shadow rate and monetary price uncertainty indices are utilized as monetary policy variables, while the equity-related economic uncertainty index, Bitcoin price index, and UCRY price and policy index are used as the other endogenous variables in the TVP-VAR model. As a consequence of the empirical findings, the shadow rate is a better indicator of monetary policy stance compared to the monetary price uncertainty index. Furthermore, the equity-related economic uncertainty index, the UCRY price and the policy index increase during periods of monetary tightening, but bitcoin prices decline during these periods. In this context, the findings have important implications for investors and policymakers.

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Causal Theories Explaining Erosion in South African State and Public Services: A Theoretical Overview

The erosion of the South African state and its public services can be understood through various social, political and economic factors. It is important to note that these issues are complex and multifaceted, often intertwined and mutually reinforcing. Several theories and patterns can help explain the erosion of the state and public services in South Africa. The core objective of this paper is to elucidate the foregoing with specific focus on purposely selected theories such as Neopatrimonialism, State Capture, Dependency Theory, Institutional Theory and Social Contract Theory and its implications for governing the South African state, and its public services. This paper will be located within a qualitative paradigm, in particular document analysis, where secondary sources of information will be scrutinized to find reasons for why things are the way they are in the South African context with the view to make recommendations on how the highlighted challenges could be addressed. This paper will make a conceptual contribution to the notion of the erosion of South African public sector institutions in general, and the field of Public Administration in particular. The paper recognizes that addressing the erosion of the South African state and public services requires comprehensive reforms, including tackling corruption, improving education and healthcare systems, creating jobs, and addressing economic inequalities. It also necessitates strengthening institutions and promoting good governance to restore public trust and ensure sustainable development.

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The Inequality Effect of Industrial Robots: Evidence from Working Hours

The application of industrial robots has raised concerns about the widening gap in working hours, which could further exacerbate social inequality. This study utilizes data from the 2014-2018 China Household Tracking Survey, coupled with regional levels of industrial robot penetration, to investigate the impact of industrial robots on working hours in China. Findings reveal a significant increase in weekly working hours and the likelihood of overwork among Chinese workers following the adoption of industrial robots, particularly pronounced within less-skilled workers. Mechanism analysis show: Firstly, income incentives emerge as the primary driver for extending working hours, with less-skilled workers experiencing heightened incentives due to their comparatively lower incomes. Secondly, the jobs of less-skilled workers are more easily replaced by industrial robots, and the pressure from job displacement has led to an increase in working hours. Thirdly, the scale effect induced by industrial robots significantly enhances the likelihood of low-skilled workers finding employment, leading to an increase in working hours. Further analysis reveals that workers without labor contracts and those employed in non-state-owned enterprises are more significantly impacted by industrial robots in terms of working hours. Increasing the minimum wage standards, implementing labor contract laws, and coordinating urban and rural medical insurance schemes significantly mitigate the inequality in working hours caused by industrial robots. Industrial robots significantly boost income, albeit with relatively modest increases for less-skilled workers. This study holds significant implications for advancing high-quality employment and promoting shared prosperity.

Chux Gervase Iwu
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Gendering [Female] Entrepreneurship Conversations – Leadership, Power and Culture Conundrum

For centuries, the concept of leadership has gained traction in every knowledge field. As widely known the term is, it has nonetheless proved difficult to define. The difficulty to define it is linked to several factors namely its association and near similarity to the concept of management, power-leadership relations, and culture nexus. Regarding management, scholars have argued that as a management function, leadership is only as good as other management functions. Thus, successful leadership requires the appropriate execution of other functions. There is, however, a description of leadership that seems to suggest this dichotomous but related expression of ability, influence, and purpose. This description is that of leadership as the ability to influence a group of people to pursue a goal (purpose). It is often said that ability can be derived from several sources, namely power, authority, knowledge, and presence or physicality. In the African setting, it is documented that women have little or no power or authority over most of society's affairs. Equally, naturally, women are born with softer, milder looks and, as such, do not present masculinity. Their knowledge, according to some researchers, is often limited by a lack of opportunities in a patriarchal setting. It is therefore unsurprising that there are schools of thought that have indicated the reliance of effective leadership on the extent of power (authority) one has and or is seen to have. Culture on the other hand relates to leadership based on the varied conceptions of leadership that are often said to be culture specific. Could these be the reason why the term leadership has yet to find a commonly accepted definition? Can this lack of a definitive definition suggest why leadership is often misunderstood in certain circumstances? Linked to the misunderstanding associated with leadership, an argument that is currently topical is linked to women's denial of opportunities based on culture. African traditions have only recently begun to prioritize women as significant participants in the mainstream economy. Before now, African society has remained and some would argue, remains patriarchal. Patriarchal societies tend to favor men over women. Could this be why the glass-ceiling effect has become a common topic in economic and management sciences research? Can this also be true in the case of female entrepreneurs who are less fortunate than their male counterparts? These questions and

more are proposed for this study which would likely adopt a mixed-method approach to source the views of small enterprise owners- males and females - for relatable answers.

The researcher believes that answers to those questions will likely enrich policy development practices that not particularly prioritize women enterprise owners but provide a good basis for equity, diversity, and inclusivity discussions.

Frederic Jallat
Professor, ESCP Business School, France

Symbolic Brand Positioning on the Music Streaming Market: An Axiological Framework

The music industry has shifted towards subscription models that sell access to vast collections of musical content. This shift is the result of significant economic, technological, and cultural changes and presents listeners with a dizzying number of possibilities regarding the music they can access.

In that sense, the growth and popularity of music streaming platforms are generally seen as a win for music consumers, giving them greater freedom and virtually limitless access to musical content. But some authors have also emphasized that if streaming services are in the business of creating branded musical experiences -which first appear to offer fluid and abundant musical content - they rather create circumscribed tiers of content access where platforms are the brand - brands which are much less attractive than the ones of the artists.

Yet as these services foster new cultures, practices and economies of musical circulation and consumption, they also create a brand new ecosystem, and challenge the established norms of promotion and consumption in an era of digital streaming.

Promotion traditionally refers to any type of communication used to inform or persuade a targeted audience of the relative merits of a product, a service, a solution, an experience, a brand or even a person.

Its objectives –especially in a digital environment- is to increase awareness, stimulate interest, develop appreciation, generate sales and ultimately favor brand loyalty, recommendation, and advocacy.

Our research emphasizes questions and challenges related to the symbolic brand positioning on the music streaming market and provides an historical and thorough analysis of their semiotic universe through case studies of advertising campaigns on the market. Its axiological framework allows to build four specific categories of consumer values based on the semantic analysis of the advertising content of two main competitors (namely Spotify and Apple Music). These positions provide a basis for the management of the brand identity in respect with questions and challenges, inspired by a semiotic model of identity.

Our formulated axiological framework creates a mapping for potential brand identity innovations, highlighting existent and possible future positions for a given platform brand within its category. Brand

managers can refer to formed axiological framework in order to get insights into the deep structure of the music streaming market, and insure a sustainable development of the brand as *a factory of meanings.*

Karl Javorszky
Retired, Austria

Update on a+b=c

Basic research brought up a possible solution to many current questions regarding the nature of interdependencies observed in biology and during research into AI. We use a Pythagorean approach to deictic logic and demonstrate the existence of typical patterns and of families of patterns on an etalon collection of 136 pairs of natural numbers (a,b), $a \leq b \leq 16$.

The etalon collection of 136 pairs of (a,b) is placed in a habitat that is subject to periodic changes. We sort, resort, and order the logical primitives according to their diverse aspects. For sorting, we use the concept known as permutations. For grouping, we make use of the cyclic properties of permutations. We find an upper limit for the number of group relations that are concurrently possible on an assembly to be $n? = exp(ln(partition(n))^2)$. The relations $n! / n?$ are fundamental. We further use a metric **liaisons** relating to the properties of groups (cycles) the element belongs to.

The work is an instruction manual on how to build the databases out of which the results are read out. The pairs of natural numbers organize themselves into paths within self-made geometries. The basic patterns that simple logical elements show when being reordered are archaic building material for logic. The terms of place and material become data in a data depositionary that is an element. Above this mother matrix of facts (which element is where when) there is a matrix of order, relations, and predictions. The accounting image of the inventory and the factual state of the inventory are two slightly deviating sets of data, which maintain a common currency of predictability resp. degree of certainty. The mutual expectations - predictions are an inbuilt feature of the symbols set and picture the rationally explainable world within the Eddington delineation. Its rules can be learnt by means of the data set we suggest the reader builds on their own computer.

I hope this Conference is the right forum to present a numeric invention to. The versatile tool provides translation coefficients between interpretations of numbers as space designators and as quality, matter and chronicity designators. The laboratory phase is over. The inventor now seeks to meet people interested in the production of a prototype of a tool that will prove to be extremely practical for generations to come.

See: Update on a + b = c - Article (Preprint v1) by Karl Javorszky | Qeios.

John Kallianiotis
Professor, University of Scranton, USA

The Effectiveness and Efficiency of the New Public Policies

In this paper we deal with the recent (1995-2023) Federal Reserve operated monetary policies, which were two unprecedented and distinct monetary policy regimes. The inflation stabilization era (1995-2008) and the zero-interest rate era (December 15, 2008-December 15, 2015) and again (March 15, 2020-March 15, 2022). These different monetary policy regimes provided different outcomes for interest rates, financial markets, inflation, personal consumption, cost of living, employment, international trade, and real economic growth. Some of the important results are that monetary policy appears to be able to affect long-term real interest rates, risk, the prices of the financial assets, and very little the real personal consumption and the real economic growth. The Fed's interest rate target was set during these nine years at 0% to 0.25%. We are trying to explain the low level of long-term interest rates and the negative real rate of interest (cost of capital). The evidence suggests that this monetary policy was not very effective; it has created a new bubble in the financial market, future inflation, and a redistribution of wealth from risk-averse savers to banks and risk-taker speculators. It has increased the risk (RP) to the risk-averse depositors by making the real rate of interest negative. The effects on growth and employment of both public policies (monetary and fiscal) were gradual and small, due to outsourcing, COVID-19, enormous debts, and unfair trade policies.

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Improving Variational Characterization Interval Bounds to Gyroscopic Problems

A quadratic matrix polynomial $Q(\lambda) = \lambda^2 I + \lambda B + C,\ \ B = B^H$, $detB \neq 0$, $C = C^H > 0$ is gyroscopically stabilized if for some $k > 0$ it holds that $|B| > kl + k^{-1}C$, where $|B|$ denotes the positive square root of B^2. The eigenvalues of the quadratic matrix polynomial are divided into four disjoint intervals: in the first interval there are negative eigenvalues of positive type, in the second interval there are positive eigenvalues of positive type, in the third interval there are negative eigenvalues of negative type and in the fourth interval there are positive eigenvalues of negative type. Therefore, this problem is suitable for the application of the variational characterization method for determining the eigenvalues. The borders of these four intervals are unknown. In this paper we will improve the borders of these itervals, to which we applay the variational characterization. We will consider the application of Sylvester's law of inertia to this thype of problem.

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&
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A Case Study of Rural Teachers Developing Bilingual Mathematics Teaching through a Teacher Professional Learning Community

Taiwan aims to become a bilingual country by 2030, advocating not only for Mandarin Chinese but also integrating English as an official language. In primary education, mathematics holds paramount significance, serving not just as foundational knowledge for more advanced subjects but also as a subject deeply intertwined with daily life. Hence, this study primarily investigates how educators in rural settings develop a Professional Learning Community (PLC) for bilingual mathematics curricula, exploring their journey, encountered challenges, and adaptive strategies. To collect data, the study utilises instruments such as interviews, curriculum documents, and classroom observations.

The establishment of a PLC among rural educators aligns with government-driven initiatives. The case study involves three mathematics teachers and a native English teacher. The PLC activities encompass scheduling meetings, collaborative curriculum preparations, classroom observations, and post-lesson discussions. The instructional framework focuses on a second-grade bilingual mathematics curriculum, collectively exploring content planning and the timing and methods of integrating English in classroom settings. However, this instructional initiative encounters various challenges. While designing the bilingual mathematics curriculum, challenges have emerged due to the scarcity of vetted bilingual materials meeting national standards, compelling teachers to engage in continual discussions regarding material validity and students' learning considerations. Additionally, the inconvenience of transportation in rural areas hinders the invitation of experts to schools for educator capacity building, limiting access to external teaching resources. Furthermore, teachers within the PLC face time constraints from overwhelming administrative duties, causing difficulties in joint curriculum preparation. Moreover, the differences in expertise between the three mathematics teachers and the English teacher led to initial divergences in PLC discussions. Nevertheless, the PLC navigate these challenges by collecting diverse resources from

within and outside the school for curriculum development and implementation, subsequently refining the curriculum. The geographic constraints are mitigated by utilizing online communication tools (e.g., Google Meet) to invite experts to provide insights and guidance to teachers. The unified efforts of the PLC members aim at educational advancement, actively overcoming these challenges.

The research findings illustrate the collaborative efforts of rural educators in enhancing bilingual mathematics education through PLCs. Overall, this study not only underscores the pivotal role of PLCs in educational reform and teaching quality enhancement but also offers specific strategies for rural educators to address challenges in developing bilingual mathematics. These insights contribute to further research and practical applications in related domains.

In summary, this study highlights the endeavours of rural educators through PLC collaboration to enhance bilingual mathematics education, providing concrete strategies to tackle challenges while emphasizing the critical role of PLCs in educational reform and teaching quality enhancement, from the perspective of mathematics education researchers.

Peter Lesko
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Measuring Current Regional Disparities in the European Union and the Future of EU Cohesion Policy

Regional disparities represent disparities in the socio-economic development of regions within a given country or between countries. Despite decades of economic integration, regional inequalities within the European Union (EU) persist. This paper examines methods for measuring these inequalities, going beyond traditional GDP metrics. An alternative method of measurement could be, for example, the EU Social Progress Index. This index provides an overview of aspects including health, access to education, environmental quality, housing, personal rights and inclusion. The 2016 findings give a mixed picture of social progress across EU regions. Moreover, when comparing GDP per capita in 2022, we find that there are significant regional differences between individual regions of the EU. Dynamic development is in favor of metropolitan regions, which grow faster than non-metropolitan regions. The support of less developed regions is therefore one of the objectives of the EU cohesion policy, where the main instruments are the structural funds. Cohesion policy is expected to change fundamentally in the coming years. It can be assumed, based also on the pace of the previous reforms, that the legislative process to establish the rules for cohesion policy post-2027 will be initiated about two years before the end of the funding period, in the first half of 2025. The aim of the article is to clarify and understand current regional disparities within the EU. The intention of our research is also to evaluate the effectiveness as well as the future of EU cohesion policy.

Radka Leskova
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Sustainability Assessment and the Importance of Environmental Indexes for Companies Operating in Slovakia

This paper focuses on the sustainability assessment of companies operating in Slovakia, with an emphasis on the importance of environmental indexes. In the theoretical part, we analyze the most commonly used environmental indexes, providing a detailed overview of 9 sections that characterize each index. We pay particular attention to the **ESG** (*Environmental, Social and Governance Index*) and **SDG** (*Sustainable Development Goals Index*) **indexes**. The **ESG index** is currently one of the significant indicators in the environmental field. It assesses environmental, social, and governance factors of companies and investment products. The index focuses on environmental aspects and measures companies' efforts to minimize their negative impact on the environment. It considers factors such as *energy efficiency*, *waste management*, *greenhouse gas emissions*, and *biodiversity protection*. The ESG index provides investment companies and investors with a tool for assessing and comparing the environmental sustainability of companies. It supports and stimulates investments in environmentally responsible companies and contributes to sustainable development and environmental protection. The **SDG index** measures and assesses countries' progress towards achieving the sustainable development goals set by the UN in the **Agenda 2030 framework**. It allows for the comparison and evaluation of the performance of individual countries in the area of environmental protection and contributes to global efforts towards achieving sustainable development. The SDG index is a valuable tool for *monitoring progress* and *supporting measures* to *protect the environment* and *achieve sustainable development goals* in Slovakia and across the EU. By comparing the ESG and SDG index scores for selected **EU-27 countries**, with Slovakia serving as a case study, we aim to identify their relative positions in terms of sustainability and the performance of individual countries within the EU. This information can be utilized as a guide for decision-making by firms and organizations in **Slovakia**, enabling them to take concrete measures to support sustainable development and improve their *environmental*, *social*, and *governance* performance. While data source and methodology

variations can affect index results, critical analysis is recommended for informed decision-making.

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Contributing and Constraining Factors Regarding the Implementation of Human Resource Management on Boarding during the COVID-19 Pandemic at the City of Tshwane Metropolitan Municipality in South Africa

Orientation: The rapid lockdown and restriction of mobility during the pandemic (COVID-19) necessitated the accelerated implementation and use of technology to aid the work-from-home measures to do normal work activities. South Africa was largely unprepared to work from home and for computer-based work practice and the technological interface. Several factors hampered the implementation of employee onboarding efforts, both online and face-to-face. These include a lack of internet fiber connection, network capabilities, electronic and computer infrastructure, computer hardware, internet connection, and sporadic electricity load-shedding, that is, the controlled temporary reduction of electricity supply to clients for several hours a day.

Motivation for the study: Onboarding as a human resource management (HRM) process during the COVID-19 pandemic required rapid change and adaptation of processes to existing work practices in the work environment to ensure the continuation of work and HRM practices. Various HRM work practices contributed to continued employee onboarding, while certain practices hindered the onboarding process during the pandemic period. The researchers wanted to determine how the implementation of onboarding during the COVID-19 pandemic was hindered and what factors contributed to the onboarding process.

Research purpose: To explore the contributing and constraining factors regarding the implementation of Human Resource Management onboarding during the COVID-19 pandemic at the City of Tshwane Metropolitan Municipality in South Africa.

Research approach, design and method: A qualitative research methodology was used for this study, within an interpretive phenomenological research design. Semi-structured interviews were conducted face-to-face to collect data from the selected participants

using inclusion criteria. Social-distancing measures necessitated the use of videoconferencing interview methods. The data collected from the interviews were analysed using thematic analysis, with ATLAS.ti used for coding.

Main findings: In the exploration of the contributing and constraining factors towards onboarding during COVID-19 at the City of Tshwane Metropolitan Municipality, the participants also discussed the future onboarding efforts.

During the data analysis process, the following themes were identified as contributing and constraining factors for onboarding during COVID-19:

Contributing factors: videoconferencing tools, paperless systems, online onboarding, intranet, and department-specific onboarding.

Constraining factors: videoconferencing tools, online onboarding, onboarding shortened/reduced, onboarding halted, network and mobile connections, electricity load-shedding, funding, familiarity with technology, COVID-19 regulations, and the availability of resources.

Practical and managerial implications: This study's practical application highlights the workplace work methods where changes and adaptation will be required to ensure that employee onboarding continued during a time of lockdown and remote working conditions. The managerial implication of this study relates to the need to rethink employee onboarding processes, based on the findings from implemented practices during the COVID-19 pandemic. Managers can utilise the information to improve a hybrid combination of onboarding processes for the future, ensuring that the onboarding process remains efficient and effective.

Contribution: This study contributed to the adaptation of work methods to be agile and to improve onboarding processes within municipalities within South Africa, as most municipalities operate under similar conditions. The study highlighted barriers to effective online onboarding, provided methods to overcome these barriers and adapt to the current and future work processes.

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Sustainable Energy Development Strategy for Poland

Energy is critical to economic and social development but, depending on the way it is produced, transported and used, it contributes to both local environmental degradation, such as air pollution, and global environmental problems, principally climate change. In Poland, this problem is particularly important because the structure of electricity production is dominated by fossil fuels. Within the last decades, the exhaustion of classical fossil fuels and the mitigation of climate changes with increase in energy demand have become major challenges for governments all over the world. Sustainable development criteria have been pushed into the front line of energy policy.

The aim of our paper is the critical review of the energy development strategies for Poland proposed in strategic government documents such as "Polish Energy Policy until 2040", “The Polish Nuclear Power Programme 2020”, “National Energy and Climate Plan for the years 2021-2030”, “The Strategy for Responsible Development for the period up to 2020 (including the perspective up to 2030)”, as well as proposals of scientific and research institutes i.e. Institute for Renewable Energy in Warsaw. The strategies are confronted with the objectives and requirements of European Green Deal.

The next step of our research will be selection of strategies for sustainable energy development and preferred low-emission technologies for Poland with an application of classical and fuzzy methods: AHP, TOPSIS, VIKOR.

Liang-Ching Lin
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LIMOS – LightGBM Interval Merton's One-period-portfolio Selection

The modern portfolio theory can assist us in allocating wealth to risky and risk-free assets reasonably by using some statistical methods. In this study, we will focus on evolving Merton's portfolio problem. Instead of the conventional parameter estimations based on only the closing prices, we include the opening, high, low, and closing prices to enlarge the database as much as possible to make the parameter estimations much more accurate. Furthermore, we consider a weighted arithmetic mean of estimations obtained from different lengths of training datasets to stabilize the estimators in which the weights are evaluated by using the least squared method. In addition, we use the LightGBM to predict the transaction directions and include not only the prices as tradition but also many statistics to be the features. In real data analysis, we demonstrate the usefulness of combining the methods above by showing the portfolio profits of selecting 10 stocks in 2018 and 2019. The results particularly show the superiority of the proposed strategy over the conventional method: the profits are almost positive and have around 32% to 72% annually.

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The Optimal Replenishment and Packaging Policies for Deteriorating Items with Logistics Loss

This paper aims to investigate the optimal replenishment and packaging policies for deteriorating items in the presence of logistics loss. We consider the deterioration of items during storage and transportation, while also incorporating factors related to logistics losses, with the goal of maximizing overall supply chain efficiency. Firstly, we establish a mathematical model based on the deterioration of items, taking into account the impact of time and the varying rates of deterioration on replenishment decisions. Through the analysis of different replenishment frequencies and quantities, we seek to identify the optimal replenishment strategy to maximize system benefits. Secondly, logistics losses, including transportation and storage losses, are considered. We introduce cost models associated with these losses and, building upon the optimal replenishment strategy, further optimize the packaging policies to reduce logistics losses and enhance the overall efficiency of the supply chain. Finally, through numerical experiments and sensitivity analysis, we validate the effectiveness of the proposed strategies and explore the influence of various factors on the optimal policies. Our research provides valuable theoretical guidance for supply chain management considering both item deterioration and logistics losses, offering practical recommendations for decision-making in real-world operations.

Michael MacColl
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Re-Thinking Strategy Formulation

This paper seeks to reinvigorate strategy formulation from an often rote and somewhat uncritical assessment that mostly culminates in an indistinct, generic and uninspiring conclusion.

We propose to firstly, integrate elements of the I/O and resource-based perspectives into a logically linked singular approach. Secondly, and central to both analysis of the firm and the assessment of competitive advantage, we leverage the importance of Market Competency as the force majeur of analysis and strategy formulation.

The consequences of this are that we dispense with considerations for SWOT analysis and limit our reliance on industry analysis from providing a "generic strategic position", towards designing a tailored (redesigned), firm-specific activity set. The strategy reformulation results in a reconfiguration (Competitive Configuration) of a (mostly) unique profile of Market competencies for the firm. The resultant market competencies profile, while based on operational activities, will still lend itself to a business level strategy label depending on the blend of low cost and differentiation features in the activity set. The extent to which value chain activities are altered has the potential to go beyond business level issues and impact the level and type of corporate strategy diversification. At this point, the creation of new emergent industries is possible.

This approach attempts to avoid the strategy formulation pitfalls of the "competency trap" and what also can be called an "industry trap" by enabling a focus on the customer and the uncertainties of the market, rather than on data, that for the most part, we already know.

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Analysis and Construction of Indicators for Public Investment in Colombia

This study seeks to determine the impact of remittances and nonlabor income on the duration of unemployment, and therefore on the hysteresis phenomenon in Colombia for the period between January 2010 and January 2021. The long-term unemployment rate in Colombia (LAPU) is calculated, and a vector autoregressive (VAR) model is subsequently estimated to evaluate the impact of remittances and nonlabor income on the LAPU. The results suggest that the increase in nonlabor income significantly affected LAPU in Colombia in the period analyzed. The growth of remittances instead turned out to positively and significantly impact LAPU only during the COVID-19 pandemic crisis. This suggests that remittances have become a fundamental income in times of crisis that allow for financing the search for work for a longer period of time, thus increasing the duration of unemployment and generating a hysteresis effect.

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Implementing Image Analysis with Azure AI Vision and Open AI for Predictive Analysis

One of the most used predictive analytics applications involves extracting necessary metadata from images and videos to evaluate the condition of real-world systems and recommend measures to sustain these systems.

Microsoft's Azure AI Vision service offers access to sophisticated algorithms that analyze images and generate insights based on the visual aspects of interest to the user. Additionally, Azure OpenAI Service has introduced an image analysis feature that leverages large language models (LLMs) to comprehend the content of images.

GPT-4 Turbo with Vision, developed by OpenAI, is a significant multimodal model (LMM) capable of interpreting images and providing text-based answers to queries regarding those images, combining capabilities in both natural language processing and visual comprehension.

This research proposes an efficient approach to implementing image analysis and automated metadata generation for images. The article compares Azure AI Vision and GPT-4 Turbo with Vision, exploring how these technologies can be utilized together for enhanced predictive analysis.

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A Novel Approach in Multivariate Outlier Detection

Detecting outliers in the multidimensional space is as important as detecting them in a single dimension. The term "outlier" refers to the observation which is in some way inconsistent with the rest of the observations in a data set. Outliers can lead to incorrect calculation of sample parameters, and thus to poor estimation of population parameters. Definitions of outliers are numerous. The most commonly cited definition is that it is "an observation that deviates so much from other observations as to arouse suspicion that it was generated by a different mechanism. Multivariate outliers are most commonly detected using the Mahalanobis distance. In this research, the statistical I-distance method is thoroughly explained, applied and compared with Mahalanobis distance, since they have similar nature and calculation process. I-distance method, as a metric in an n-dimensional space, has been originally devised in order to rank countries according to their level of development, based on several indicators. There are many improvements of this method that led to its widespread use, such as multivariate outlier detection. This research is conducted on 30 point guards in the NBA league and the values of nine indicators were measured in order to detect players with specific set of skills.

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Exploring Motivations and Preferences in Digital Influencer Engagement among American and Portuguese Higher School Students

In today's digital age, the pervasive influence of digital influencers on youth behavior has become a prominent aspect of contemporary culture. Digital influencers, individuals who leverage social media platforms to cultivate large followings and shape audience perceptions, wield significant power over young peoples' attitudes, preferences, and behaviors. This phenomenon is particularly salient among high school students in diverse cultural contexts, where the intersection of digital media, youth culture, and cultural identity gives rise to complex dynamics.

Culture serves as a foundational framework that shapes individuals' beliefs, values, and social norms, influencing their perceptions and interactions with digital media. Moreover, cultural differences and nuances play a crucial role in shaping the reception and interpretation of digital influencer content among youth across different cultural contexts.

Motivations and preferences in digital influencer engagement are essential factors shaping the dynamics of youth interaction with digital media. Understanding what drives students to follow specific influencers and their preferences for content types, platforms, and communication styles can provide valuable insights into the underlying mechanisms of influence.

This study investigates how American and Portuguese higher school students perceive, engage with, and in their perspective, are influenced by digital influencers,. The research objectives include understanding perception, motivations, and preferences, analyzing

engagement and identifying cross-cultural differences in the role of digital influencers in youth behavior.

A qualitative approach based on focus group discussions was employed, involving students from both countries to delve deeper into their perceptions, motivations, preferences, and experiences with digital influencers, as well as their influence on attitudes and behaviors. A comparative analysis of the data collected among Portuguese and American student groups was conducted to elucidate cross-cultural differences in digital influencer engagement.

Expected results include a deeper cultural understanding of how cross-cultural differences may influence the relationship between digital influencers and American and Portuguese high school students. This research contributes to the growing body of literature on digital media influence and cross-cultural dynamics, providing insights into the complex interplay between digital influencers and youth behavior in diverse cultural contexts.

Nadya Morozova
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Developmental Graphs Comparison Strategy for Analysis of Pattern Formation and Phylogeny

We apply mathematical formalization of a development in living organisms as a graph and next apply graphs comparison strategy for the analysis of some intriguing phenomena of the process of embryogenesis.

Namely, in most taxa of plant and animal kingdoms the first steps of embryogenesis and the final morphology of an organism are strongly determined. But surprisingly, the determination of these patterns does not correlate from phylogenetic point of view, namely, different unrelated big taxons can have the same type of development in early embryogenesis, while there can be different types of early embryogenesis inside one big taxon. Here we provide an insight into the problem of possible interrelation between these two phenomena.

First, we propose a strategy of construction developmental graphs (trees) formalizing a process of embryogenesis. Second, we suggested an algorithm of trees comparison, developed specifically for this type of labeled graphs, which allows calculating a distance between two developmental trees, and thus clustering them into groups. Next the analysis of correspondence between the obtained clusters and the inception of morphological features in a given clustered group of organisms can elucidate the interrelation between developmental trends and formation of morphological structures.

We illustrate the suggested methodology on the analysis of 30 examined plant species belonging to different taxa of various ranks. The analysis of obtained clusters of developmental trees allowed predicting those cells in early embryos which are responsible for the inception of morphological structures of these species.

Jason Moschella
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Do Insiders Follow their Competitors' Trades?

I develop new measures of insider sentiment that capture the clustering of insider trades across peers in the same industry and across the broad market. These measures serve as indications of conviction among insiders within an industry and at an aggregate market level. I find that my measures of aggregate insider sentiment are positively related to firm-level insider trading activity, and that these relationships are economically meaningful. Results of cross-sectional tests reveal that the effects of industry-level insider sentiment are moderated by product market competition, intra-industry earnings co-movement, and firm-level information asymmetry. In addition, the effects of market-wide insider sentiment are moderated by economic policy uncertainty and firm-level information asymmetry. Finally, I find a strong association between aggregate insider sentiment and future abnormal stock returns, even though aggregate insider sentiment does not map well to firms' future earnings and cash flow processes. I also document a high degree of co-movement in insider sentiment across the Industrials, Consumer Discretionary, Health Care, and Technology sectors, and that the co-movement is somewhat persistent over a 1-quarter time horizon.

Catalin Silviu Nutu
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Decrypting Evolutionary Fractals using Intelligence Models based on the CSN Matrix

This paper is expanding on a previous paper of the author [1], by providing an alternative intelligence model to complete the present models of A.I. This new intelligence model is based on the CSN Matrix presented in this referenced paper [1].

This CSN Matrix can be used, on one hand, to decrypt evolutionary fractals having unknown rules, and on the other, it can be used to simulate the way in which random creative processes occur. The CSN Matrix simulates better how brain behaves, because when making scientific discoveries, often times, existing information is not processed as in classical A.I models, which are mostly deterministic, but it is processed aleatory by brain, in random processes, as in the model based on the CSN Matrix.

Decryption of these evolutionary fractals may be the key of understanding of human brain functioning and of human intelligence. The first step, however, is the decryption of evolutionary fractals related to more simple lifeforms, and only then, after the decryption at this first step, the decryption of the human intelligence may be addressed.

The model presented in this paper can either be used as an entirely independent intelligence model to simulate human intelligence random creative processes, but it also can be used to create enhanced intelligence models.

Research Question

Evolutionary fractals are defined as fractals evolving from a certain shape into another one, by changing shapes because of moving through different fractal rules, or in this particular case, from a life form into another, from an initial state of the life form into a final state of life, by passing through a multitude of phases and transformations. More exactly it means a structure based on and constructed using a set of many fractals, each one having its own fractal rule.

Evolutionary fractals may be deemed as structures in which is embedded the Intelligence of Nature.

The first step toward decrypting the Intelligence of Nature is the decryption of these evolutionary fractals.

Understanding human brain processes may imply decryption of the evolutionary fractals, after previously decrypting more simple evolutionary fractals encountered in Nature.

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&
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Estimating Labour Market Matching Efficiency at Different Educational Levels

The existing educational structure in the EU member states may not always affiliate with the labour market needs. A mismatch between the existing educational structure, skills that are taught in schools and universities, and the skills needed in the workplace is a serious problem. Such incompatibility is increasingly difficult to keep pace within the context of rapid technological progress and it is a key threat to economic growth and development considering that in the long term, such a situation can result in the increase of structural unemployment. It should not be forgotten that the effectiveness of the matching process also depends on the business cycle. The main approach in these types of research concentrates on the matching process which relates to matching the needs of employers and unemployed job seekers to fill vacancies.

As the job matching process changes over time in relation to business cycles, the best way to graphically show the matching process in the labour market is by using the Beveridge curve which shows the empirical relationship between job vacancies and unemployment. The Beveridge curve is thought to be an indicator of the efficiency of the labour market functioning.

The majority of the existing research focuses on general labour market trends or the aggregate data for a specific country. Instead of focusing on general trends in the labour market, this research is a step forward because we analyse disaggregated data - how different levels of education among workers respond to general trends in the labour market. Therefore, we have developed the following research question - Do worker groups with different levels of education experience the impact of aggregate labour market trends in different ways?

This paper analyses the existing educational structures of selected EU member countries and their alignment with the labour market (LM) needs. To evaluate this educational mismatch, the paper explores the matching needs of employers and unemployed job seekers by using disaggregated national employment office data. Previous research mainly used Labour Force Survey data which are not disaggregated

according to all nine ISCED levels of education. The paper examines the selected group of EU countries (AT, HR, SI, ES) from 2010 to 2022, using the Beveridge curves. Our results show that differences in education levels result in relatively small deviations from aggregate trends in the LM. Aggregate LM trends strongly impact all education groups in the labour market.

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Some Thoughts on Teaching Set Theory

The Zermelo-Fraenkel axioms for set theory are the ones presented in most textbooks on this subject. There is another, less well-known axiomatization of the concept of set. From a purely logical point of view, the chief difference between these two approaches consists in what each one takes as the basic, undefined concept. The traditional approach takes this to be the membership relation, whereas the other one takes as its basic concept that of map, mapping or function. From a philosophical point of view, much has been said about the advantages and disadvantages of one approach over the other. In this talk, I discuss some issues raised almost exclusively by philosophers of mathematics, but from an educational point of view, thus raising the question of what we should teach when we teach set theory.

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&
Avdullah Hoti
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Labor Market, Gender Differences and Family Policy

The sustainability of Kosovo's labor market continues to be among its main challenges. The labor market is characterized by a high inactive labor force and gender differences, where family policy has a significant impact. The purpose of this paper is to study the current labor market policies, gender differences and family policy in Kosovo by drawing comparative parallels with the same policies of some of the European countries based on literature review. The research done with panel data from Kosovo data has found a large gap between the employment of women and men, with men dominating employment almost in all economic sectors. However, the research found that in a few years, women were paid more than men. The paper concludes with the results that the greater growth of the working age population is associated with higher unemployment, due to the increased number of job seekers.

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Qing Liu
Professor, Renmin University of China, China
&
Stephen Yeaple
Professor, Pennsylvania State University, USA

Learning to Export like China: From Processing Trade to Ordinary Trade

China's international trade growth in the past 40 years has been unprecedented in the world's economic history: its share of global exports has risen from less than 1% in 1979 to 13.45% (the largest exporter) in 2018. What are the explanations for this miracle? What lessons can be drawn for other developing countries? This paper aims to investigate the role of processing trade in China's foreign trade achievements. Processing trade made up more than half of China's trade in the early years, but ordinary trade has been the main mode of trade in recent years. Two specific questions are important to discuss. First, does China's ordinary trade learn from processing trade? Second, how and by how much? Arguably, processing trade plays more important roles in China than in most other countries, but these two questions have not been systematically analyzed and satisfactorily answered. This paper makes a significant contribution to the understanding of China's trade growth from an important and interesting angle.

Martha Rivera Pesquera
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Transforming a Commodity into a Premium Brand: Avocados from Mexico Case

Since 2015, Avocados From Mexico has masterfully used social media to stimulate audience participation. Initially, the company used common digital marketing strategies to generate awareness by increasing the frequency of advertisements and soon after moved to a more advanced plan. Creativity and innovation were fundamental in its strategy. Avocados From Mexico used interactivity and connectivity to create a better customer experience by capturing data from end consumers. The company, marketing strategy and overall approach was to increase avocado consumption in the US market. Three elements supported the communication strategy: a clear mission, a well-defined target market, and excellent positioning. Avocados From Mexico achieved the objectives of generating an outstanding brand and at the same time creating value for the consumer and avocado producers. In just five years, Avocados From Mexico achieved its goal of becoming the number one avocado brand in the United States by increasing consumer preference by 250%. They were successful in building brand value from 2015 to 2020 in three areas: TV, PR, and digital. But in 2021 they asked themselves: what would happen if we stopped investing in television and instead supported the buyer with PR and digital media? So, they moved their TV budget to a Brandformance strategy, achieving extraordinary results and record sales in 2021.

What this case teaches us is how companies can manage the five pillars of modern marketing practice: 1) centralization and integration, 2) data management and CRM, 3) technology adoption and Martech, 4) Customer Journey, and 5) KPIs and metrics.

This case shows us how the new marketing is evolving and how the CMO should change the mentality for the future.

Irina Rodriguez De La Flor
Researcher and CEO IMI, University of Alcalá, Spain

Inner Management and a Possible New Type of Human Intelligence

Using an historical analysis of intelligence theories, the study aims firstly to identify whether the abilities related to the Inner Knowledge Management (IKM) model are connected to one or more types of intelligence. Secondly this study seeks to investigate if there are IKM abilities that are not connected to any intelligence theories. Lastly the study aims to show that certain IKM abilities that have never been described in any previous intelligence theory could be the base for a new type of intelligence named Conscious Intelligence. To conclude, the study proposes that this new type of intelligence could be potentially positioned in between the Emotional intelligence theories and Spiritual intelligence theories. The study is limited to theories that have been proposed in the XX and XXI centuries.

Different human intelligence theories have measured numerous human abilities, factors, or variables to define various types. Traditional theories of intelligence focused on cognitive abilities that were related to a type of knowledge that contained an objective component, such as the mathematical or the verbal skills, the memory, or the problem-solving abilities. More modern theories of intelligence consider also abilities that possess a non-purely objective component. This is the case of the so-called Emotional Intelligence (Killian, 2012) that studies the ability to understand other's feelings, the Social Intelligence (Gilbert, 2019) that studies the ability to connect with others or the Spiritual Intelligence (Currie, 2023) that studies the ability to connect with the spiritual life.

Cognitive intelligence theories study cognitive abilities that allow individuals and organizations to organize and manage objective knowledge that is related to the physical world. This helps societies to develop efficient political, social, economic, and industrial systems. Emotional intelligence theories study abilities that allow individuals, organizations, and societies to be aware of emotions and feelings, to manage and communicate emotions or to engage with others, abilities that are also fundamental for the human progress. Spiritual intelligence theories study abilities that allow individuals to connect with their higher self, to see the spiritual in everyday life or to connect with a higher consciousness.

Despite all the progress, there are still economic, social, political, and environmental inefficiencies that happen at individual, local, national, and international level due to subjective differences. Physical, mental, emotional, and spiritual needs are often managed in isolation and new perspectives need to be explored if we want to create solutions that consider the interconnectedness of all individuals and all societies.

The purpose of this article is twofold. Firstly, the study aims to carry out a conceptual analysis of the abilities defined in the different theories of intelligence from the traditional Cognitive Intelligence, the Emotional Intelligence, or the Multiple Intelligences theories to the most modern theories of intelligence such the Spiritual Intelligence. Secondly, the study aims to analyze if the abilities and competences developed by the IKM model and based on subjective variables are related to a particular type of intelligence, or, in case they are not, if those competencies can be considered a new type of intelligence.

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The Academic Portfolio as an Assessment Purpose-Driven Tool in the Training of Primary School Teachers in Mathematics

This paper aims to outline the implementation methodology of the academic portfolio as an assessment tool in Algebra and Number Systems I and Algebra and Number System II courses. These courses are part of the elementary teacher students' curriculum in mathematics during their program formation's final year at Pontificia Universidad Católica de Chile.

The use of portfolios has emerged as a necessity for designing an effective strategy to bridge the observed gap between course content and the required learning outcomes that the students must achieve with their future students when they become teachers. This gap is particularly significant in both courses due to the level of abstraction and mathematical formalism required, primarily because of the topics covered, including number systems, logic, and axiomatic set theory.

The description of the model's implementation begins with an in-depth look at the initial phase of student-teacher negotiation, which is aimed at establishing a learning contract. In this phase, both parties collaboratively determine the essential elements to be included in the portfolio. Following this, the course rules are meticulously reviewed. This is succeeded by a comprehensive explanation of the class content, learning objectives, and the materials to be utilized, along with the grading rubrics. These components are strategically designed to continually highlight to the students the relevance of their learning in the context of their future roles as teachers. A pivotal aspect of this model is the role of the teacher as a facilitator, who is responsible for effectively conveying this purpose-driven approach to the students.

Preliminary findings suggest that this approach not only bridges the gap between theoretical content and practical learning outcomes but also fosters a deeper engagement with complex mathematical concepts. This methodology, therefore, holds promise not only for improving the efficacy of mathematics education in teacher training programs but also for contributing to the broader goal of elevating the quality of mathematics teaching at the elementary level. Future research could explore the scalability of this approach and its adaptability to other areas of mathematical education, potentially improving the way we assess and facilitate learning in complex subject areas.

Unlike traditional assessment instruments, which often increase students' negative perceptions of this gap, the implementation methodology and portfolio described in this paper provide a more effective approach. This method also empowers students to become protagonists of their own learning process, keep records of their work and improve their academic self-efficacy.

In conclusion, the implementation of academic portfolios in Algebra and Number Systems courses has demonstrated significant potential in enhancing the learning experience of elementary teacher students.

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How close are Macro-Economics/Macro-Thermodynamics? The Knowledge & Energy Pair Economies in the Net Zero Era

The paper has two academics parts; the first addresses several common features that relate to the theoretical bases of the two disciplines, the second part is underlining the paradigm that the author proposed in 2022 (the knowledge-energy "KE" pair) that is present in all activities encountered in any enterprise. In part 1, the author elaborates on two new terms in MacroEconomics; Income Potential Function "IPF", Labor Effort "LE", that were introduced in 2002 through his work with Dr. Professor Ibrahim Oweiss. Innovations represent a key factor in deriving the developments of both nation's economies and electrical power systems. Part I opens new areas for generalizations of theories in MacroEconomics based on established theoretical treatments in MacroThermodymamics. In parts I&II, many applications from Economics and Thermodynamics that exhibit similar trends are noted supporting the close relation of the first part of the Paper's title. The novel concept of the KE pair in part II could lead to a knowledge measurement scale.

In part IV, with the ideas and thinking behind the contents of parts I&II, factoring his expertise in energy the author summarizes important considerations for economists dealing with nation's economies to meet the big challenges facing countries in the energy transition/ decarbonization/Net Zero Era by 2030 and 2050. Relatively short times to transform the energy infrastructure that was built over more than a century (for most countries).

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Structural Change, Growth and the Increasing Service Trade in Low- and Middle-Income Countries

This paper explains the increasing service trade in low and middle countries of the world and tries to relate it with structural change in endogenous growth framework. As per World Bank Report the export and import of services in such countries have increased by 496% and 562% respectively in the period from 1996 to 2018 against the corresponding rates of 355% and 319% for the world as whole. The developing countries have undergone structural changes mostly directly switching over to services from agriculture skipping the phase of industrialisation. To what extent this kind of structural change is responsible for the growing service export is an important query of this study. The share of services in GDP is 60% and above in many countries like India, Brazil ,Bulgaria, Philippines, South Africa, Costa Rica, Uruguay and Mexico. Many countries in this category have comparative disadvantage in industrialisation. The international market for industrial products is highly competitive and industrial growth largely depends on technological innovations and sufficient R&D expenses. As per World Bank report 2-3% of GDP is spent on R&D in developed nations, whereas it is less than 1% in low and middle income countries. The years of schooling which is a measure of human capital formation and helpful for service sector growth, is quite high in low income countries. So, the growth of service sector may be one important reason behind the increasing service export. This paper has considered a three sector endogenous growth model with agriculture, industry and services where the reallocation of resources across sectors takes place leading to structural change depends on productivity differences caused by endogenous technological change. The changes in the sectoral composition of GDP and in the relative prices of the goods leads to changes in composition of export. The results of panel regression based on data from 34 developing countries of Asia-Pacific region, Latin America and Europe reveal that years of schooling and the share of services in GDP have significant effect on service export while the expenditure on R & D is so low that it has no effect on per capita income, industrial growth and export. The service sector led growth in such countries increases the comparative advantage of services in the international market. Regarding the import demand for services the results of panel regression show that import of services

depends on per capita GDP, FDI and industrialization indicating that as per capita GDP rises demand for imported service increases. FDI also increases the import of business and production related services.

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The Future of Work Study in the South African Context

Orientation: To survive in the current competitive and global environment, it is important for organisations to continuously look at ways to improve efficiency and productivity. The field of work study focuses on improving the productivity and efficiency of humans, machines and materials.

Motivation for the study: The future of work study in the South African context became blurred as work study moved from being units on its own to now falling under other units such as Human Resource Management and Organisational Development. Work study is an important function in organisations but the future thereof in South Africa is uncertain.

Research purpose: The purpose of this study was to explore the future of work study by looking at the barriers and contributors of work study in the South African context.

Research approach/design and method: The study was exploratory in nature and a qualitative research method was used. This research adopted a constructive interpretive approach, which comprised the specific field experiences, perceptions, views and evidence as well as the multiple realities of experts in work study. Purposive sampling was used to include work study practitioners who were members of the Southern Africa Institute of Management Services (SAIMAS) with more than 5 years of work study experience. Semi-structured email interviews were used to gather data from twelve volunteering participants. The interview transcripts were transferred to Excel sheets to facilitate analysis. Thematic analysis was used to analyse the data. Manual colour coding as well as deductive and inductive coding were used. The saturation of data, where enough data was collected to draw the necessary conclusions and any further data collection would not produce new value-added insights, was taken into consideration.

Main findings: The following themes were identified: Lack of understanding the role of work study, manipulation of work study, lack of decision-making power, lack of management support, excellent competencies, meeting business needs and adding value to the organisation.

Practical/managerial implications: For work study to ensure a managerial impact, it should help management and work study practitioners to be aware of the barriers and contributors to achieve a smooth production flow with minimum interruptions. The lack of management support might negatively impact work study. South Africa organisations should rethink work study to remain competitive in a fast-changing world.

Contributions/value-add: The future cannot be predicted but alternative work study futures can be forecasted and referred futures can be envisioned and then invented. Work study can contribute in giving South African organisations a competitive edge. In this study, new knowledge about the barriers and contributors of work study were obtained.

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Interest Rate and Inflation Relationship-Fisher Hypothesis: Definition of the Inflation Basket

The Fisher hypothesis suggests that there is a positive relationship between interest rates and expected inflation without specifying the nature of inflation or the price index used to calculate it. This lack of definition raises questions, especially if headline CPI inflation is utilized for calculations that may not be entirely relevant. Note that CPI inflation could be biased in measuring true inflation, or the indices experienced by savers or borrowers might differ due to varying basket compositions.

This study aims to identify or estimate the components of inflation that dictate the relationship between the 3-month deposit interest rate and inflation used by the Fisher hypothesis with the Turkish data. To achieve this, the Least Absolute Shrinkage and Selection Operator (LASSO) method will be employed to determine which CPI inflation subcomponents are important for the Turkish interest rate. To be particular, we will estimate the 3-month deposit interest rates with more than 1692 sub-components of calculated CPI inflation. Initial findings suggest that 17 variables out of 72 subcomponents of CPI inflation, encompassing both future projections and past values of 12 main sub-components of inflation are statistically significant for determining deposit interest rates. Key among the inflation subcomponents, Housing, Water, Electricity, Gas and Other Fuels; Transport (including automobile purchases); Furnishings, Household Equipment, and Routine Maintenance of the House; Communications and Recreation; and Culture; Alcoholic Beverages and Tobacco; and Clothing and Footwear subcomponents have statistically significant explanatory power for 3-monthly deposit interest rates. The first four subcomponents are important because average households consider these four components a part of their saving for purchasing houses, automobiles, and home appliances. In other words, Housing, Household Equipment and Transportation (inclusive of automobile purchases) emerge from their perceived role as alternative saving instruments to bank deposits by average households. These components reflect significant expenditure areas that, when influenced by inflation, affect household decisions on savings and investment, potentially altering the traditional reliance on bank deposits for returns. The recreation and Culture subcomponent can also be considered as an alternative saving instrument

to bank deposits since it includes Television, PC and Laptop, PC equipment, and Tablets. When the low price elasticities of Housing, Water, Electricity, Gas and Other Fuels; Transport; Clothing and Footwear are considered, the importance of these subcomponents is relevant.

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Innovation or Imitation? Effects of Public Health Insurance on Pharmaceutical Development in China

This paper investigates the impact of public health insurance on pharmaceutical development in China. While extensive evidence from developed countries indicates a positive relationship between market size and pharmaceutical innovation, it remains unclear whether and how policy-induced market incentives affect pharmaceutical research and development (R&D) in developing countries. Using novel data on clinical trials and marketing applications for new drugs in China from 2007 to 2020, we measure pharmaceutical innovation and imitation separately. By exploiting the quasi-experimental setting of a large-scale public insurance program for catastrophic diseases in China---the critical illness insurance program (CII) ---we find that the number of new clinical trials for the affected diseases did not increase in response to the policy change. However, the CII is associated with a significant 37% increase in new generic drug marketing applications. Moreover, the increase in generic drug applications is driven by an increase in duplicative generic drugs and chemical drugs rather than first-in-China and biologic drugs that require relatively higher technology capacities. Our findings highlight the importance of understanding the relationship between imitation and innovation in analyzing policy-induced incentives for pharmaceutical R&D in developing countries.

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Green Human Resource Management and Firm Performance

Sustainability is currently a global challenge and organizations are increasingly using more environmentally sustainable management practices and processes. Green human resource management (GHRM), or the human resource management (HRM) aspects of environmental management (EM), is pivotal to effective EM at the organizational level through employee training, performance management, and rewards, among other practices. GHRM is a socially responsible and sustainable HRM system, where the GHRM practices are usually aligned with the environmental sustainability goals of the organizations with aim at developing human capital that support those goals of the organizations. However, there is a paucity of in-depth research examining the impact of GHRM on firm performance. While a growing body of research has investigated the impact of GHRM on employees, the firm-level impact of GHRM is largely unknown. There is also a need to go beyond firm profits as the measure of organizational success to include wider environmental performance indicators. In this paper, we review the literature on GHRM and firm performance, advance theory and propositions, and discuss avenues for future research.

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If you Can't Beat It, Join It! Teaching and Learning Mathematics with ChatGPT and Key Prompts to Stimulate Self-Learning

In this paper, we demonstrate the use of ChatGPT for teaching and learning mathematics, despite the frequent occurrence of miscalculations. The increasing popularity of ChatGPT among students, on the one hand, and the challenge of incorporating mathematical expressions into prompts, on the other, led us to develop an editor for mathematical expressions in a format compatible with ChatGPT syntax. This innovation enables students to interact with the bot effectively.

The only tool to communicate with ChatGPT is a prompt. In case students are interested in asking for help in math problems from class assignments, they just need to type queries in the ChatGPT message box, while writing mathematical expressions in LaTeX format. To facilitate this, the Chat-Mat module of the Halomda platform features a tool for editing and transferring expressions to ChatGPT.

To address the issue of false answers generated by ChatGPT and the pedagogical concerns regarding the automatically generated solutions, we integrated ChatGPT with new tools. These include Math Prompt Editor, Algebraic Calculator, Graph Plotter, and a list of Key Prompts, transforming the toolkit into a comprehensive Chat-Mat™ unit. This integration allows students to interact with ChatGPT and verify its responses.

The central pedagogical principle behind Chat-Mat can be formulated in the following assertion: student's mastery of any mathematical subject is proportional to the time dedicated to studying it. Accordingly, the provision of diverse activities correlates with enhanced academic achievement.

Following this principle, we offer students a math prompts editor and streamline their access to ChatGPT's message box adjacent to the Halomda's editing window. We anticipate that students, upon attempting to solve exercises, may encounter difficulties due to possible miscalculations. To foster deeper engagement, we encourage them to

validate solutions using the Graph Plotter and Algebraic Calculator provided by the platform. These tools offer visual and algebraic representations, respectively, of correct solutions, although without the explanatory of ChatGPT.

In addition to direct problem-solving, we provide supplementary tools for students to pose various questions to the AI bot. These prompts aim to enrich their understanding of the subject matter, enhance problem-solving skills, and ultimately improve exam performance.

To aid students in formulating effective prompts, each problem in the Learn and Train sections of the Halomda system includes a list of recommended "Key Prompts." These prompts encompass three categories, reflecting didactic ideas for student engagement, including:

1. Solving equations, integrals; calculating derivatives, simplifying expressions, etc., relevant to the topic.
2. Recalling definitions, theorems, proofs related to the topic.
3. General questions on history, applications, “tricky” questions (paradoxes, etc.).

By furnishing students with suggested prompts, we cultivate the ability to compose their own questions and also enrich their learning experience with additional contextual information.

Sets of Key Prompts have been integrated into various tasks in mathematics and physics, such as "Complex functions," "Limits and derivatives," "Statistics," "Quantum mechanics" and other.

Currently, a study on the utilization of Key Prompts and other Chat-Mat tools by mathematics students is underway across several colleges in Israel, with results expected to be published soon.

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Perceived Factors of the Performance Management and Development System of a South African State-Owned Company

Orientation: State-owned companies play a significant role in the South African economy. In key sectors such as electricity, transport (air, rail, freight, and pipelines), and telecommunications, such companies play a lead role, often defined by law, although limited competition is allowed in some sectors such as telecommunications and air. Continuous performance management helps managers who work at state-owned companies to track employees' progress against goals and personal development and make informed decisions about additional compensation. A performance management and development system (PMDS) is a significant and key strategic issue facing state-owned companies in South Africa.

Motivation for the study: It is not clear what the PMDS factors within South African state-owned companies are. Knowledge of such factors may assist managers in successfully implementing the PMDS at state-owned companies to improve employee performance.

Research purpose: The study intended to explore the perceived PMDS factors at a selected South African state-owned company by using an open-ended research approach.

Research approach/ design and method: An exploratory research design and a qualitative research method within interpretivism as the research philosophy was adopted in this study. Semi-structured face-to-face interviews were conducted to collect data from 12 employees in one of SA's state-owned companies. A purposive sampling technique was used to include the relevant participants. The saturation of data was taken into consideration. The data collected from the interviews were analysed using thematic analysis, with ATLAS being used for coding. Deductive and inductive coding were used.

Main findings: The following themes were identified in this study: Favouritism, working in silos, insufficient capacity building, ineffective

performance management, incompetent and unethical managers, complicated scorecard template, misconception of the performance management process, financial constraints and a lack of strategic plans.

Practical/managerial implications: The management cadre of the selected state-owned company can utilise this study's findings to improve the implementation of PMDS. Knowledge of the PMDS factors will also allow management to proactively identify potential areas for improvement. If the management of this South African state-owned company does not consider these identified PMDS factors, the implication may be that poor decisions could lead to a lack of achieving organisational goals and ultimately staff turnover.

Contributions/value-add: This study added to the body of knowledge on PMDS factors within a South African state-owned company. This study showed that the PMDS should be aligned with the company's mandate. Lastly, the study contributed to a better understanding of the employees' perceptions and recommended ways of improving the effective implementation of the PMDS.

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Application of Statistics in Evaluation of State of Health and Lifetime of Electrical and Electronic Components

For electrical and autonomous vehicles, the importance of reliable electrical and electronic components cannot be overstated. With an increasing number of electrical and electronic components being used in vehicles, ensuring their state of health and reliability is crucial for both comfort and safety. One of the key indicators of state of health and reliability is the lifetime of electronic components. Statistics play a very important role in the estimation and evaluation of the reliability, state of health and lifetime of electrical and electronic components. An electrical connector is one of the crucial electrical and electronic components. In this paper, various data-driven statistical methods and probability distributions for the reliability and lifetime prognosis of electrical connectors are introduced.

Since electrical connectors, along with all other electrical and electronic components used in electrical and autonomous vehicles, are reliable components with a very long lifetime, classical lifetime tests are time- and labor-intensive. To address this challenge, a data-driven method has been proposed that predicts the lifetime of electrical connectors using statistical analysis of electrical contact resistance data collected from short-term tests. Both distribution-based methods with different distributions and a distribution-free method are used for the analysis. Additionally, a sensitivity analysis is performed to investigate the influence of the selection of different time durations on the prognosis of lifetime. The results of the sensitivity analysis using percentiles of contact resistance are compared with probability distribution-based methods. The predictions from this method have been compared to actual results obtained from long-term tests. A strong correlation has been observed between the predicted contact resistance development with short-term data and the number of failures in later stages of testing. Thus, apart from predicting the lifetime of connectors, this method can also be applied for failure prognosis in real-time operations.

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On Evolution Cocycles Associated to Control Systems

The aim of this paper is to highlight new trends and current developments in the study of evolution cocycles associated to control systems.

Over the last years, several concepts of the control theory, as stability, stabilizability, detectability, controllability or observability were refined. The differential equations that generally relate the inputs and outputs of a control system can be asymptotically addressed by means of evolution cocycles.

Therefore, the properties of stabilizability and detectability of a control system are strongly linked with the stable behaviour of the associated evolution cocycle. But these properties are not sufficient to assure the exponential stability of the cocycle.

The theory of evolution cocycles and of skew-evolution semiflows allows a straightforward operator-theoretic analysis of internal stability as determined by classical frequency-domain and input-output operators, even for nonautonomous Banach-space systems.

In particular, the stability is shown to be equivalent to input-output stability for stabilizable and detectable systems. The various concepts of stability and the related results that we emphasize in this paper for evolution cocycles extend some classic notions of the stability theory.

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The Impact of Social Transfers on the Consumption of Cultural Goods – The Evidence from Poland

Many countries have introduced programs providing direct transfers in cash as a form of social aid. Some of these programs have a crucial impact on children and families. In many cases, this kind of direct support increases the level of income in the household. Also, income is one of the substantial determinants of the demand for cultural goods.

The main aim of this article is to figure out the impact (positive) of the direct social transfers programs on the individual cultural consumption of the cultural goods in Poland. The time range of the research is separated into two sets: the years 2012 – 2015, and the years 2016 – 2021 when one of the widest program - "Family 500 Plus" was implemented. The results of the evaluation of the double logarithmic regression reveal the strong negative impact of the program on households' budget expenditures on cultural goods per capita.

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The Development of Ethno-mathematics Teaching Activity Design Based on Bunun (a Taiwan Indigenous Tribe) Traditional Weaving

The purpose of this study is to explore the mathematics knowledge contained in the traditional woven fabrics of the indigenous tribe, Bunun, in Taiwan, and then apply it to design indigenous culture-based mathematics teaching activities for the Bunun students in order to assist the maintenance and recovery of tribal culture. The research subjects are an elderly couple from Bunun whilst the wife is an expert in traditional weaving. Through the help of indigenous language experts and Bunun cultural experts, the collected materials including video files, interview records and artefacts are interpreted and analysed. Then, based on the geometrical patterns from the Bunun traditional woven fabrics, the mathematics teaching activities are designed and taught in the local junior high school.

Some reflections after conducting this ethno-mathematics research are as follows: (1) it is important to obtain the tribal acknowledgement first; (2) researchers need to gain some understanding of the difference between the tribal culture and mainstream culture; (3) hands-on inquiry activities are especially crucial for the indigenous students' mathematics learning; (4) ethno-mathematics teaching activities may enhance indigenous students' cultural acknowledgement.

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Centering Community Voices in Design: Project PEER

In the contemporary marketing landscape, the intersection of graphic design with human-centered and socially-conscious principles provides a powerful channel for not only understanding community needs but also engaging with them in meaningful ways. This presentation showcases the Project PEER (Prevent, Engage, Empower, and Respond) initiative, a federally funded interdisciplinary collaboration between The University of Iowa and Southern University and Agricultural & Mechanical College-Baton Rouge, as an example of how design, through branding and marketing, can enhance public health campaigns. This project focused on a culturally-responsive, Human Immunodeficiency Virus (HIV) and Substance Use Disorders (SUDs) prevention program for African American young adults (ages 18-25), a demographic often underrepresented in traditional health marketing strategies. Employing community-responsive design solutions that are positive, bold, and engaging was critical to launching a public awareness campaign that eradicates the stigma around HIV and substance use prevention, and empowers African American young adults with critical information, strategies, and community connections to meet their own health needs.

Central to this approach is the role of branding and marketing in making health information accessible and relatable. The design process in Project PEER involved extensive community input to ensure that the resulting products—ranging from digital assets to print materials—were not only visually appealing but also culturally pertinent and informative. This participatory design process ensures that the materials are not only seen but also acted upon, thereby amplifying the campaign's reach and impact.

This presentation will delve into the specific strategies employed in Project PEER, discuss the preliminary outcomes, and explore the potential for scaling and adapting these methodologies to other public health challenges and demographic groups. Through this discourse, the presentation aims to provide valuable insights and frameworks that can be utilized by marketing professionals and designers alike in creating more engaging and impactful marketing campaigns directed at marginalized communities.

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Using an Online Dynamic Geometry Curriculum to Gain Insights into Preservice Elementary Teachers' Learning of the Properties of Quadrilaterals

Research has found that many elementary teachers in the United States are lacking the deep conceptual understanding necessary to adequately teach mathematics to their students in a meaningful way. Consequently, teacher educators must help elementary preservice teachers (PTs) use accessible research-based curricula that will better prepare them to conceptually understand the mathematics they teach. One curriculum that tries to address this, is the Individualized Dynamic Geometry Instruction (iDGi). iDGi is a National Science Foundation funded online interactive Dynamic Geometry learning system based on several elementary learning progressions. It was created to develop elementary students' conceptual learning of geometry topics (length, area, isometries, quadrilaterals, and triangles) through a series of learning progression sequenced instructional modules. In this study, we extend iDGi use from elementary students to PTs enrolled in a Mathematics for Elementary Teachers university course to investigate how iDGi instruction affected their learning about the geometry topics they are frequently asked to teach. For this paper, we focus on PTs' learning of prototypical defining properties of quadrilaterals. These properties express in formal geometric terms the most visually salient spatial characteristics that students use in identifying different types of quadrilaterals and interrelationships between quadrilaterals. As an example, the prototypical defining properties of a rectangle are opposite sides that are congruent and parallel, and four right angles. Instructors assigned specific iDGi quadrilateral modules for PTs to complete prior to quadrilateral concepts addressed in class to encourage PTs to develop their own initial conceptions. During the classroom quadrilaterals unit, a typical class had PTs working collaboratively on an activity that was designed to be used alongside the assigned iDGi modules. Each class activity was followed by a whole

class discussion in which PTs revealed their findings from the activity and the instructor assessed and advanced PTs' reasoning through questions and scaffolding techniques. Data was collected over 5 years with multiple Mathematics for Elementary Teacher's classes that used iDGi with instruction. There were four instructors who taught these courses using iDGi, with whom each course was taught using an inquiry-based teaching method and using the same lesson plans. Data collection also occurred prior, during, and after the COVID-19 pandemic, therefore, data is from both in-person courses and courses that were taught synchronously on Zoom. To measure learning from iDGi, we used one-sample matched pairs and two-sample t-tests by having 541 PTs take the same online multiple-choice test to check their understanding before using iDGi (pre-test) and after (post-test). We used a significance level of $\alpha=0.05$. The results showed that there was not enough evidence to suggest that the instructor, quarter, or method of instruction (i.e. Zoom or in-person instruction) made a difference in the scores, but the increase in the scores after the use of iDGi curriculum was statistically significant—evidence supporting the hypothesis that the use of iDGi was beneficial.

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Development of a Machine Learning Approach to Identify Veterans Carrying the V142I Variant in the US Veterans Administration Healthcare Network

Background: Hereditary amyloidosis (haTTR) is a severely underdiagnosed debilitating disease that is due to a variant in the TTR

gene (c.424G>A p.Val142Ile, also referred to as V122I), which is found in 3-4% of individuals of African ancestry (AA). Penetrance approximates 100% with increasing age. Early diagnosis is key to successful therapy but is hampered by the initial heterogenous and nonspecific presentation of the disease, slow progression, and failure of healthcare providers recognize symptoms and appropriately work up patients. Our goal was to create an AI tool that uses features from the electronic health record to identify individuals likely to carry the V142I variant, and thus at risk for hATTR, among the U.S. Veterans Administration's (VA) AA population.

Methods: We developed an analytic cohort in the Million Veterans Program cohort (MVP) among Veterans who were genetically similar to self-reported non-Hispanic Black (NHB) Veterans and who underwent genome-wide genotyping. The V142I variant was imputed based on the 1000 genomes project reference panel. For every Veteran who carried the V142I variant we selected 5 age, sex, and race/ancestry matched non-carriers to serve as controls. We removed subjects with < 10 clinical visits, age < 50 years, and presence of other known TTR variants. Clinical data comprising clinical procedures, diagnoses, medications, laboratory results, and specific clinical features derived by natural language processing of text notes was extracted from the VA electronic medical record and one-hot encoded. We used logistic regression to estimate effect sizes and standard errors for the association of each feature with V122I carrier status and then calculated z-scores for each feature by dividing the effect estimate by its standard error. For each individual we then computed a composite score based on the sum of the z-score for each feature multiplied by its respective indicator variable for each feature.

Results: Among all MVP participants genetically similar to self-described NHB Veterans (123K), 3,861 (3.1%) carried the V142I variant. After matching the analytic cohort comprised 19,892 individuals. The mean age was 58.3 years and 17,630 (88.6%) were male. Among the 1000 highest risk individuals identified by cumulative z-score, 293 carried the V142I variant. This was significantly (binomial test $p < 0.001$) more than the 187 that would be expected to carry the variant by chance based on the composition of the analytic cohort.

Conclusions: V142I carrier status can be predicted based on clinical features from the electronic health record. The ability to identify these individuals at risk for hATTR based on their existing clinical information in their medical records and refer them for clinical genetic testing is a new strategy for early detection of hATTR risk and will likely deliver earlier access to proven therapies for individuals with this

condition. We are currently deploying an alternative analytic strategy (Bayes Network analysis) in the analytic cohort. Once completed, we will attempt to validate the prediction model by applying it to all NHB patients in the nation-wide VA healthcare network to identify potentially at-risk Veterans and perform clinical genetic validation testing in the 2000 Veterans at highest risk.

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Building Sustainable Business Models through a Hierarchical Ethical Approach and S-D Logic

Sustainability must be instilled in the business models to fight environmental destruction. Care for the environment must be prioritized from the design to the business management. A recent revision of the Business Model Canvas contributes to integrating the environmental, social, and economic value propositions in the design of business models. However, it is necessary to overcome conflicts when proposing different types of value. Applying Hans Jonas' Responsibility Principle and philosophical perspective, a hierarchical approach and ethical principles are suggested to resolve possible ethical dilemmas. This approach is inspired by Isaac Asimov's Three Laws of Robotic and should be embedded in design, for example, by adopting circular economy models. Moreover, the adoption of service-dominant logic as a theoretical framework is also discussed to treat the design of sustainable business models as the application of sound contemporary marketing theory.

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Adjusting the Balance between Alpha and Beta Risks in NN Classifiers

Classification tasks involve assigning the correct label to a given data. Typically, there are only two classes, such as fraud/not fraud for security purposes, breakdown/not breakdown for reliability studies, or sick/not sick for medical purposes as examples. It is important to note that two types of errors can occur, but they do not have equal impact. Misclassifying a fraud as non-fraudulent has a much greater impact than the opposite. In statistical studies, hypothesis testing involves two hypotheses: H0 and its opposite, H1. This approach can result in two types of error: Type I error (alpha), which is the risk of falsely rejecting hypothesis H0, and Type II error (beta), which is the risk of falsely accepting hypothesis H0.

If the hypothesis H0 (or H1) corresponds to the data belonging to class 0 (or class 1), for example, where class 0 represents 'not sick' and class 1 represents 'sick', then the alpha risk corresponds to the false alarm rate and the beta risk corresponds to the non-detection rate, which are commonly used in classification.

The two risks, alpha and beta, are linked; an increase in alpha risk results in a decrease in beta risk and vice versa. The principle of statistical studies is to select an acceptable alpha risk to construct the test, which enables risk management. In classification problems, the primary objective is to minimize the misclassification rate. The two risks may not be chosen but are instead imposed by the learning process. This is notably the case when using neural networks, particularly multilayer perceptron, to perform classification tasks. It is often the case that the two risks are not equal, which can be a drawback in many application purposes.

This paper aims to propose a modification of the learning algorithm for multilayer perceptron to manage the balancing between two risks. This modification is based on the use of a weighted criterion to minimize, taking into account that different error types have different

signs (negative errors correspond to Type I errors, while positive errors correspond to Type II errors).

The initial results on a simulated benchmark are promising, allowing for tuning of the alpha risk from 1% to 7%, resulting in a corresponding beta risk ranging from 39% to 17%. The statistical test with a confidence interval of 5% shows that these results do not degrade the misclassification rate.

Additionally, this paper presents results on a medical dataset. The patients are distributed into different categories ranging from healthy to ill patient by using a combination of different tuning of the alpha and beta risks, which allows for differentiation in patient treatment.

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Redistributive Consequences of a Global Carbon Tax with Global Distribution of the Revenue

Since the marginal social cost of emissions of carbon dioxide is globally uniform, a globally uniform carbon tax is efficient. However, it has been particularly difficult to persuade poor nations to consider a carbon tax in the range of the global marginal social cost. It might be possible to persuade these nations to consider such a tax if the proceeds of a globally uniform carbon tax were shared among all nations in proportion to their populations. The paper estimates the redistributive consequences of a globally uniform carbon tax with a globally uniform distribution of the revenue from the tax. It discusses the operation of such a tax in the context of a prediction market for estimating the global marginal social cost of carbon dioxide emissions and related marketable vouchers to distribute the revenue from the tax.

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COVID-19 Asymmetry – Hardly an Ill Wind

The effect of COVID-19 on total remuneration is examined using a natural experiment of COVID-19 (first reported in Canada on Jan 25 2020) on groups of employees at a large public Canadian university. Time series date from the immediate prior two years and the following two years to test hypothesis that groups holding higher levels of economic power and status will exert such power to increase their own economic benefits, an effect not available to those traditionally holding lower power.

Findings, limitations, implications, and future research are discussed.

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A Study on the Feasibility of Establishing a Teacher Professional Learning Network through the Implementation of On-line Public Lesson Mode

Numerous studies have shown that students' learning is closely related to the teaching expertise of the teacher. Therefore, the professional development of teachers is imperative. Influenced by lesson study, "public lesson" has become an essential process for the professional development of primary school teachers in Taiwan since 2019. However, due to the nature of its implementation, school types, the composition of professional learning community members, and the limitations of time and space, the effectiveness of teachers' professional growth has been limited. Consequently, it is necessary to establish a professional learning network for the implementation of public lessons.

This study aims to construct a professional learning network (PLN), leveraging the advantages of the internet to reduce constraints related to personnel, space, and time. Through the implementation of public mathematics lessons, the study seeks to facilitate dialogues among mathematics teachers, with the expectation of fostering the professional development of their mathematics teaching. Teachers' mathematical teaching knowledge is analysed through their dialogues, and the mathematics quality for instruction is examined via the analysis of their classroom teaching video records. Ultimately, the study presents recommendations for perspectives and models of teacher professional learning community activities on the internet, anticipating contributions to the professional growth of primary school mathematics teachers.

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Long-term Benefits of Blood Pressure Management on Memory Complaint Reduction: A Time Series Analysis in a 4-year Prospective Cohort in Hong Kong

Objective: The blood pressure (BP) trend is shown to have seasonally fluctuated; and is affected by both personal physical and cognitive conditions. This study aimed to investigate the long-term benefits of a BP management programme with adjustment for year-round BP fluctuations among the elderly in Hong Kong.

Methods: Participants with ages above 55 years were recruited from elderly centres and were prospectively followed-up since September 2016. Personal health conditions were interviewed by social workers. Those with suboptimal BP records, follow-up nursing calls and social engagement activities were offered. Participants with over 80% of weekly BP records in at least 2 years of follow-up were included. The seasonal BP fluctuations and random noise of the BP trend were adjusted by time-series models. The BP trends were tested by the Mann-Kendall test, and the downward BP trend was defined as the optimal BP control for the hypertensive participants. The logistic regression models were used to investigate the potential factors for optimal BP control.

Results: A total of 1,151 participants with a mean age of 79 years were included in the study. Based on the trend testing, 662(58%) participants were classified as improved and stable BP trends defined as downward and consistent trends of BP records, and 489(42%) were classified as having deteriorated BP levels. The multivariate model showed that improved and stable BP trends were associated with baseline systolic BP levels, (OR 1.03, CI 1.02-1.04), cholesterol problems (OR 1.26, CI 0.98-1.63), and subjective memory complaints (OR 0.64, CI 0.47-0.85) (Table 1). Compared with daily junk food intake, eating less than once a week was good for BP management.

Conclusion: Seasonal blood pressure fluctuations always influence

the performance of blood pressure management programmes. Time-series modelling is possible to figure out the real trend of personal blood pressure records after adjustment for seasonal effects. This study demonstrates that the long-term benefits of our blood pressure management programme were limited by the elderly with memory complaints. When we are offering blood pressure management programme, special arrangement is required for the participants with mild cognitive impairment or even dementia.

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Business Startups: Gaining Intelligence from Open-Access Business Qualitative Datasets

Small and medium-sized service companies stand to benefit from data analytics tools. These tools allow small teams to extract value from text-based datasets too large for hand-processing. Startups initially have no historical data. The teachings extracted from their customers' reviews may come too late to prevent costly mistakes. However, a wealth of open-access data is available on public repositories like Kaggle.

This research project explores whether hospitality startups could benefit from consumer reviews and ratings from analyzing large publicly available datasets when developing their business model and plans. In the first phase, the researchers will analyze a publicly available dataset from a multinational coffee shop chain to identify factors that enhance operational efficiency for services provided. The dataset comprises textual reviews, ratings, and location information, offering comprehensive insights into customer sentiment and feedback. Various analytical techniques were employed to extract actionable insights, such as sentiment analysis, consumer insights generation, and natural language processing (NLP).

The analysis method involved three phases: data exploration, visualization, and pre-processing, followed by articulating operational challenges and objectives based on customer review patterns. The variables will be ranked in priority order with SAS, a statistical analysis tool, and Weka, a machine learning and data mining tool, to prioritize predictive and textual data analysis. The dataset undergoes pre-processing to ensure data integrity throughout the analysis process, utilizing techniques such as sentiment analysis, text parsing, text filtering, and information retrieval, creating a text cluster profile, and generating a word cloud. The processed data will allow us to understand the behavioural patterns of customers and provide the opportunity to identify operational segments that require more attention or improvement.

Tools include Python for data manipulation, Power Query for data transformation in Power BI and Excel, and SQL for database queries and manipulations. Additionally, the researchers used advanced Excel techniques for data analysis.

Expected outcomes include enhanced decision-making facilitated by improved data accuracy, operational efficiency achieved through efficient data acquisition, strategic insights guiding departmental strategies, and informed decision models supported by robust data integrity checks. This research provides valuable insights to enhance operational performance and customer satisfaction. This project seeks to optimize processes and elevate the overall customer experience by integrating advanced analytical techniques and data-driven strategies.

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The Impact of Leadership on the Grit of International Migrated Teachers

Orientation: Over the past decade, the teaching profession has become increasingly borderless due to the international migration of teachers. The leadership of these migrant teachers is progressively becoming more challenging. By understanding grit and leadership teachers' motivation and competencies directly spill over to the school's performance.

Motivation for the study: The effective management of schools has a substantial impact on teachers' job satisfaction and general well-being. High turnover rates are reported among migrant teachers in various international schools. Leadership holds the key to a school's overall success. This stemmed from a critical need to understand and enhance the dynamics within educational organisations in relation to leadership and grit.

Research purpose: The purpose of this study was to determine the perceived impact of leadership on migrated teachers' grit.

Research approach/design and method: The study was exploratory in nature and a quantitative research method was used. This research adopted a constructive interpretive approach, comprising interest in understanding the world of lived experience from the point of view of migrating teachers employed at international schools. Homogeneous purposive sampling was applied to include migrated international teachers. Two existing structured questionnaires relating to grit and leadership were used and sufficient responses were gathered to draw rich and applicable results. Descriptive and inferential statistics (Correlation analysis, Kruskal-Wallis's rank test, and linear regression analysis) were applied by making use of SPSS version 26.

Main findings: The main findings of the research delivered interesting results as it uncovered distinctive differences between the years of experience of teachers and grit, the highest qualification group, and leadership as well as the different subject areas and grit. A strong positive correlation between the two variables (leadership and grit) was determined by indicating that leadership predicts grit in migrated teachers.

Practical/managerial implications: The research will contribute to the leadership of international schools and the understanding of the effect of leadership styles on the grit of migrated teachers, furthermore, the differences detected between the biographical groups and their perceptions of leadership and grit should guide leaders in supporting and managing migrated teachers to maintain and improve a competitive school environment.

Contributions/value-add: The research contributed to attaining greater knowledge and understanding of leadership and its implications on the grit of teachers in the international school environment, with specific reference to the challenges that migrated teachers experience in their everyday lives. The study furthermore contributes to the improvement of the lives and wellness of migrated teachers. With the identification of specific leadership challenges the provision of necessary leadership skills can be introduced.

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Between the Central and the Peripheral Route: Investigating the Effectiveness of Communicative Nudging as a Third Advertising Strategy

Currently, the dominant model of how consumers process advertising is without doubt the Elaboration-Likelihood Model (ELM). This model distinguishes between two different routes a consumer can follow when processing an advertisement, depending on both their motivation and their capacities (that is, intellectual ability and/or contextual opportunity): the central versus the peripheral route. In the central route, consumers elaborate cognitively on the product/brand information an ad has to offer. In the peripheral route, consumers are persuaded via the affective reactions elicited by so-called 'peripheral cues' (e.g., cute baby's, attractive persons, funny animals, pleasurable music, witty humor, beautiful scenery, etc.) included in the ad. Correspondingly, two prototypical advertising strategies can be distinguished: (a) the central strategy in which the ad(vertiser) provides relevant product/brand information to stimulate central processing; (b) the peripheral (or affective) strategy in which consumers are exposed to peripheral cues in order to induce in their brain a positive ad-likeability which translates into a positive brand-likeability.

However, inspired by the Nobel Prizes awarded to Daniel Kahneman (2002) and Richard Thaler (2017), a new branch of economics – called 'behavioral economics' – has recently come to flourish. These scholars focus on the cognitive biases in the consumer's mind and on the heuristics (that is, rules-of-thumb) consumers use to make their decisions (instead of basing those decisions on extensive cognitive elaboration). The idea of a third marketing strategy – nudging – soon arose out of these new insights. Nudging then comes down to tapping into the consumers' cognitive biases or their use of heuristics so as to influence their decisions.

Up till now, nudging has mainly found its way into marketing practices in terms of the manipulation of 'choice architectures'. A choice architecture can be defined as the design of different ways in which choices are presented to consumers, and the impact of that presentation on consumer decision-making. So far, nudging has been mainly a matter of changing the physical choice architecture: e.g., placing the healthy food snacks on eye-level in school vending machines and the unhealthy options 'out of sight' (e.g., at the bottom of those machines).

However, one can also tap into the consumer's cognitive biases and his/her heuristics on a communicative level. Therefore, nudging can be regarded as a third advertising strategy.

In our research project, we used A/B-testing to investigate the effectiveness of tapping into 10 different biases/heuristics consumers often use in their decision making: from the anchoring effect to the zero risk bias. We did this by measuring the expected effectiveness of 50 advertisements for which we created a neutral 'nudge-free' version, and a manipulated version using a specific nudging strategy. Our respondents (N = 400) included both men and women, and both younger (aged 18-25) and older (aged 45-55) generations. The results clearly illustrate the potential fruitfulness of communicative nudging as a third advertising strategy in-between the (highly cognitive) central and the (merely affective) peripheral strategies as suggested by the ELM.

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Income Inequality, Energy Poverty, and Carbon Emissions: A Cross-Country Analysis

Income inequality and energy poverty affect consumer behavior, which are key obstacles to the global low-carbon transformation. Applying a Dynamic Panel Data (DPD) model, this paper investigates the effect of income inequality, energy poverty, and their interaction on global carbon emissions. Based on a panel data set of 193 countries during 1990-2019, a negative role of income inequality and energy poverty alleviation in carbon emission reduction is observed. For one standard deviation increase in the Gini index, the carbon emissions per capita increase by 17.33%, under extreme energy poverty. An increase of 1% in access to electricity will reduce carbon emissions per capita by 19.21%, ceteris paribus. These findings suggest a new approach to low-carbon transformation by reducing carbon emissions per capita through energy poverty alleviation and reducing income inequality.

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The Role of Rumors in the Domestic Sovereign Debt Market: Evidence from Prewar China

This paper analyzes how rumors impacted the domestic sovereign debt market in Prewar China (1921-1937), during a time when government debts dominated the security market and *The Shenbao* was the main information source for investors, offering an ideal setting to study rumor effects on the security market. Using our original database containing weekly investment returns of debts traded on the Shanghai Chinese Merchant Stock Exchange (SCMSE) and rumors from *The Shenbao*, our empirical findings reveal that: first, rumors significantly affected the public debt market. Surprisingly, despite fewer rumors in the Beijing Era (1921-March 1927) compared to the Prewar Nanjing Era (April 1927-July 1937), the former was more susceptible to rumor influence; Second, negative rumors had a highly significant negative impact, whereas positive rumors were ignored; Third, whether rumors proved to be true or false did not lead to significantly different market reactions. Both types of rumors triggered market activity; Lastly, the debt market lacked even weak-form efficiency, providing fertile ground for rumors to thrive and influence. This pioneering study explores the impact of rumors on the sovereign debt market, an area less explored than the company stock market, thereby enhancing our understanding on their influence on securities markets.

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Identifying Sustainability Efforts in Company's Reports Using Text Mining and Machine Learning

This study delves into the utilization of text mining to scrutinize social and environmental reports of companies, showcasing its effectiveness in evaluation. It explores various text mining techniques and practically applies decision tree, k-nearest neighbors, and naïve Bayes methods. The paper offers guidance on extracting pertinent terms related to four

CSR dimensions: Environment, Employee, Social responsibility, and Human rights. Results demonstrate the successful differentiation of text based on these dimensions, leveraging a CSR-relevant dictionary by Pencel and Malascue. Employing document classification techniques, the study constructs four models using distinct text mining approaches for comparative analysis. Through this research, the valuable role of text mining in assessing social and environmental disclosures is underscored, providing insights into optimizing these techniques for evaluations and emphasizing their potential to enhance understanding and decision-making in corporate social responsibility assessments.

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Impact of ICT on Business Continuity and Sustainable Performance: Mediating Role of Digital Transformation Culture

This study examines the Information and communication technologies (ICT) adoption and use and its relevance to business continuity. Additionally, it investigates sustainable performance dimensions and their correlation with ICT and digital transformation culture. Furthermore, this article will explore digital transformation culture and its significance on the relationship between ICT's impact on business continuity and sustainable performance. Drawing on a solid theoretical framework, including Triple Bottom Line Theory (Elkington ,1994) and Dynamic Capabilities View (Teece, 1997), and an extensive literature review, a conceptual model will be proposed that will depict the relationship between ICT-adoption/use and business continuity management and disaster recovery planning in a firm. In addition to the relationship between ICT-adoption/use and the pillars of sustainable performance, the model will also show the role that digital transformation culture, may play in the core ICT – Business Continuity and ICT – Sustainable performance relationships. The model will pave the way for an empirical study that will test the model and the proposed hypotheses.

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The Rise of the Educated Class

Recent decades have seen dramatic rise of extreme right-wing parties in the West. This paper explores the economic background for this phenomenon. It suggests that this political phenomenon can be accounted to economic development. The first is the rapid spread of high education, which increased significantly the educated class since the end of WWII. The second is the shift in production specialization in the West, mainly in the US, from manufacturing to global services. These two processes have destabilized the political coalition between blue collar workers and the educated, which dominated politics throughout most of the Twentieth Century.

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Ranking by Pairwise Comparison with Preference of Orders

There is no doubt that rankings have become a significant part of the modern society. If you run business on a website, you want your website to be ranked number one. Research shows that customers are 40% likely to click on your site if you are ranked number one by Google, 30% likely to click if you are ranked second and 24% likely if you are ranked third. Hence, to be rank at the top is key for success of your business. If a student is applying for university admissions, rankings have become ever important in students' choice of the universities and in parents' perception about a university. Ranking also affects employers' perception on the quality of the education institutions, which further affect their decision on recruiting students. If you are a sports player sports, there is no need to mention the importance of being ranked on the top. However, ranking is no simple matter and different ranking methods may lead to different ranking results. The question raised is which ranking methods are fair and the best. In this paper, I will first provide a review of existing ranking methods and discuss their pros and cons. Then, several new ranking methods will be proposed as an attempt to improve the performance of the existing ranking methods. One advantage of our proposed ranking methods is that they can be applied to datasets with missing observations.

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CycleTTA: Continuous Cyclical Test Time Domain Adaptation

Deep learning models have made significant strides in various fields, demonstrating exceptional capabilities in image recognition, natural language processing, and predictive analytics. However, these models often face challenges when there is a discrepancy between their training environments and the new, unseen data they encounter during testing. This gap, primarily due to models being optimized on specific datasets, necessitates a method to enhance their adaptability to new data domains during testing. Test time domain adaptation (TTA) addresses this need by optimizing pretrained models during the testing phase, but traditional TTA methods have limitations. They tend to overfit to specific test domains and often presume static target domains, which is not reflective of the dynamic and cyclical nature of real-world scenarios.

To overcome these challenges, this paper introduces the CycleTTA framework, an innovative approach designed for continuous cyclical test time domain adaptation. CycleTTA is tailored to address the dynamic nature of real-world data, enabling source-pretrained models to maintain robustness and effectiveness as the testing data undergoes changes. The key feature of our method is the implementation of matrix-wise perturbation noise in batch normalization statistics, a technique that allows for a more flexible adaptation process. This method enables the model to adjust to new data patterns without requiring additional parameters or extensive retraining.

To demonstrate the effectiveness of CycleTTA, we conducted experiments with advanced deep learning models such as WideResNet-28-10, WideResNet-40-2, and PreactResNet-18. These models were chosen for their efficiency in various tasks, and the results from our experiments were highly promising. We observed significant

improvements in the generalization capabilities of these models in continuous testing scenarios compared to traditional TTA methods.

The CycleTTA framework is particularly relevant in fields such as autonomous driving, where environmental conditions change rapidly; medical imaging, where patient data can vary significantly over time; and real-time surveillance systems, which must adapt to varying environmental factors like lighting and crowd densities. By effectively bridging the gap between training and testing phases, CycleTTA enhances the resilience and adaptability of deep learning models, making them more suited for dynamic and evolving real-world applications.

In conclusion, CycleTTA marks a substantial advancement in the field of domain adaptation. It provides a scalable, efficient, and adaptable solution for various applications, enhancing the capability of deep learning models to handle the complexities and dynamics of real-world data. This research opens new horizons in the application of AI, potentially leading to more robust and efficient systems capable of navigating the ever-changing landscape of real-world data environments.

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