ATHENS INSTITUTE

Abstract Book

28th Annual International Conference on Education
18-23 May 2026, Athens, Greece

Edited by
Nick Linardopoulos & Olga Gkounta

2026

Abstracts
28th Annual International Conference on Education

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9 Chalkokondili Street
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TABLE OF CONTENTS

(In Alphabetical Order by Author's Family Name)

Preface

This book includes the abstracts of all the papers presented at the *28th Annual International Conference on Education* (18-23 May 2026), organized by the Athens Institute.

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

The purpose of this abstract book is to provide members of the Athens Institute 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. Athens Institute 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 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 the Athens Institute's mission, the presenters in these conferences are coming from many different countries, presenting various topics.

Table 1. *Publication of Books of Abstracts of Proceedings, 2010-2026*

Year	Papers	Countries	References
2026	48	20	Linardopoulos and Gkounta (2026)
2025	82	19	Linardopoulos and Gkounta (2025)
2024	76	31	Linardopoulos and Gkounta (2024)
2023	62	19	Linardopoulos and Gkounta (2023)
2022	73	23	Wick and Gkounta (2022)
2021	36	19	Papanikos (2021)
2020	33	17	Papanikos (2020)
2019	92	31	Papanikos (2019)
2018	117	30	Papanikos (2018)
2017	160	40	Papanikos (2017)
2016	112	38	Papanikos (2016)
2015	161	40	Papanikos (2015)
2014	136	50	Papanikos (2014)
2013	124	37	Papanikos (2013)
2012	107	32	Papanikos (2012)
2011	119	26	Papanikos (2011)
2010	161	28	Papanikos (2010)

It is our hope that through Athens Institute'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, Athens Institute has organized more than 400 international conferences and has published over 200 books. Academically, the institute is organized into 7 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 the Athens Institute 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 Education. The breadth and depth of research approaches and topics represented in this book underscores the diversity of the conference.

Athens Institute'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 *28th Annual International Conference on Education*, accomplished this goal by bringing together academics and scholars from 20 different countries (Brazil, Canada, Cyprus, Egypt, Finland, Germany, Israel, Italy, Japan, Kosovo, Latvia, Norway, Oman, Peru, Singapore, Slovenia, Sweden, The Netherlands, Türkiye, USA), which brought in the conference 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 conference 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.

Nick Linardopoulos & Olga Gkounta
Editors

28th Annual International Conference on Education, 18-23 May 2026, Athens, Greece

Organizing & Scientific Committee

All Athens Institute's conferences are organized by the Academic Council. This conference has been organized with the assistance of the following academic members of Athens Institute.

1. Dr. Gregory T. Papanikos, President, Athens Institute.
2. Dr. David Philip Wick, Director, Arts, Humanities and Education Division, Athens Institute & Retired Professor of History, Gordon College, USA.
3. Dr. Mervyn J. Wighting, Deputy Director, Arts, Humanities and Education Division, Athens Institute & Professor Emeritus, Regent University, USA.
4. Dr. Nick Linardopoulos, Head, Education Unit, Athens Institute & Associate Teaching Professor & Public Speaking Course Coordinator, Rutgers University, USA.
5. Dr. John Spiridakis, Co-Editor, Athens Journal of Education & Chair and Professor, St. John University, USA.

FINAL CONFERENCE PROGRAM
28th Annual International Conference on Education, 18-23 May 2026, Athens, Greece

PROGRAM

Monday 18 May 2026

08:30-09:15
Registration
09:15-10:00 Opening Speech and Welcoming Remarks
Speaker: Gregory T. Papanikos, President, Athens Institute & Professor (Adjunct), University of Tennessee, Knoxville, USA.

10:00-11:30 Session 1

Session 1a **Moderator: Nick Linardopoulos**, Head, Education Unit, Athens Institute & Associate Teaching Professor & Public Speaking Course Coordinator, Rutgers University, USA.	**Session 1b** **Moderator: Till Haenisch**, Professor and Head, Informatics Study Program, DHBW Heidenheim (Baden-Württemberg State University), Germany.
1. **Yvonne Pratt-Johnson**, Professor, St. John's University, USA. ***Title**: The Impact of Globalization on the Professional Competence of Educators and Educational Leaders.* 2. **Terry Stockton**, Assistant Professor, Grand Valley State University, USA. **Sarah Chase**, Faculty, Grand Valley State University, USA. ***Title**: Teacher Preparation Professional Dispositions: Global Implications for Reinforcing Ethical Responsibilities.* 3. **Eleni Coukos Elder**, Professor, Tennessee State University, USA. **Patrice Elder**, Educational Consultant, Tennessee State University, USA. ***Title**: Toxic Behaviors in Higher Education Institutions: Examining Demographic Factors Affecting Faculty Perceptions.* 4. **Adam Nir**, Professor, The Hebrew University of Jerusalem, Israel. ***Title**: The Subordination of Public Schools to Dual Hierarchies: Challenges and Opportunities.* 5. **Noor Al-Najjar**, Associate Professor, Sultan Qaboos University, Oman. ***Title**: From Planning to Practice: A Competency-Based Framework for Bridging the Theory–Practice Gap in Teacher Preparation.*	1. **Jianhua Yang**, Professor, Columbus State University, USA. ***Title**: Broadening Cybersecurity Awareness for Middle School Girls via Outreach, Cyber-games, and Storytelling.* 2. **Stavros Georgakopoulos**, Distinguished Professor, Florida International University, USA. **Constantinos L. Zekios**, Assistant Professor, Florida International University, USA. **Ricardo Sendrea**, PhD Candidate, Florida International University, USA. ***Title**: A Multi-Fidelity Deep Learning Framework for Robust Computational Imaging.* 3. **Ayman Eldeib**, Associate Professor, Southern New Hampshire University, USA. **Austin Bryan**, Student, Southern New Hampshire University, USA. **Mohamed Saad**, Associate Professor, Minia University, Egypt. ***Title**: Genomic Analyzer: A Scalable and High-Performance Object-Oriented Application for SNP Analysis and Genetic Association Studies.* 4. **Hamid Farrokh Ghatte**, Assistant Professor, Antalya Bilim University, Türkiye. **Seyed Mohammad Amin Abtahi**, Assistant Professor, Antalya Bilim University, Türkiye. **Muzaffer Koc**, Assistant Professor, Antalya Bilim University, Türkiye. ***Title**: AI-Driven Multi-Modal*

	Assessment of Building Vulnerability in Seismic Zones.
11:30-13:00 Session 2	
Session 2a **Moderator: Mervyn J. Wighting,** Deputy Director, Arts, Humanities and Education Division, Athens Institute & Professor Emeritus, Regent University, USA.	**Session 2b** **Moderator: Hamid Farrokh Ghatte**, Assistant Professor, Antalya Bilim University, Türkiye.
1. **Tya Collins**, Assistant Professor, University of Ottawa, Canada. ***Title**: Who is Steering the Process? Governance and Loose Coupling in Special Education Placement.* 2. **Bujar Gallopeni**, Assistant Professor, International Business College Mitrovica, Kosovo. ***Title**: Perceived Safety, Risk, and Violence Exposure among Schoolchildren: A Psychosocial Analysis of Factors Shaping School Safety.* 3. **Ulrika Gidlund**, Senior Lecturer, Mid Sweden University, Sweden. **Lena Ivarsson**, Lecturer, Mid Sweden University, Sweden. ***Title**: Students with Special Educational Needs – Discourses and Practice in Movement.* 4. **Nava Bar**, Lecturer, University of Haifa, Israel. ***Title**: Experiences and Inclusion Challenges of Novice Special Education Educators in Mainstream Schools in Israel.*	1. **Nick Linardopoulos**, Associate Teaching Professor & Public Speaking Course Coordinator, Rutgers University, USA. ***Title**: AI, Communication and the Future of Teaching & Learning.* 2. **Mark van der Pas**, CEO, Uffective, The Netherlands. ***Title**: Enhanced Time Estimation Improvements in Agile Developments: A Seven-Year Natural Experiment.*
13:00-14:30 Session 3 **Moderator: Terry Stockton**, Assistant Professor, Grand Valley State University, USA.	
1. **Jingzi Huang**, Professor & Associate Dean, College of Education and Behavioral Sciences, University of Northern Colorado, USA. ***Title**: Connecting Program Assessment of Teaching Talent Training in Higher Education to the Reality of the Schools: A Case Study of Assessment Development for a Teacher Preparation Program.* 2. **Jose Roberto Serra Martins**, Professor, Federal Institute of São Paulo, Brazil. ***Title**: Teaching Training for Science Teachers: From Self-Formation to the Operationalization of Projects.* 3. **Molly Tovar**, Educational Consultant, Trail Tree Consulting, USA. **Kellie Thompson**, Educational Consultant, Trail Tree Consulting, USA. ***Title**: The Importance of Training Teachers on Indigenous STEM Concepts in K-12 Education.* 4. **Michele Vaz**, Business Manager, McMaster University, Canada. **Tom Wanyama**, Associate Professor, McMaster University, Canada. ***Title**: Expanding Engineering Education through Outreach at the SEPT Learning Factory.* 5. **Sabine Khalil**, Associate Professor, Illinois State University, USA. **Bahae Samhan**, Associate Professor, Illinois State University, USA. ***Title**: User Adoption of Augmented Reality Exhibitions: Insights from a U.S. Study.*	

14:30-15:30 Lunch

15:30-17:30 Session 4
Moderator: Jingzi Huang, Professor & Associate Dean, College of Education and Behavioral Sciences, University of Northern Colorado, USA.

1. **Arie Kizel**, Professor, University of Haifa, Israel.
   ***Title**: Expanding Buber's I-Thou to I-Virtual Space-Thou in Students' Relations.*
2. **Tamara Bell Boyle**, Founder, Organization Hopemore International, USA.
   ***Title**: A Longitudinal Study: How Prepared Did Educators Feel they were, to Teach Virtual – Prior, during, and after the COVID-19 Pandemic Quarantine?*
3. **Stephen Adofo**, Researcher, University of Eastern Finland, Finland.
   Sirpa Kärkkäinen, Senior Lecturer, University of Eastern Finland, Finland.
   Jingoo Kang, Research Fellow, University of Eastern Finland, Finland.
   ***Title**: Mock Examinations in Science Under High-Stakes Testing: Teachers' Perceptions, Practices, and Implications for Pedagogy, Equity, and Well-Being.*
4. **Astrid Schmied**, Education Research Scientist, National Institute of Education, Nanyang Technological University, Singapore.
   ***Title**: Adapting Critical Appraisal Tools for Context-Sensitive Systematic Meta-Reviews in School-Based Mathematics-Related Education.*
5. **Robert Mejias**, Professor and Director, Center for Cyber Security Education and Research, Colorado State University-Pueblo, USA.
   Morgan Shepherd, Professor, University of Colorado-Colorado Springs, USA.
   Raul Y. Reyes, Professor, University of Arizona, USA.
   ***Title**: Possible Determinants of Information Security Vulnerability Awareness (ISVA).*
6. **Elizabeth Diaz**, Associate Professor, University of Texas at Arlington, USA.
   ***Title**: miABCTamil: Bridging the Digital Divide in Tamil Language and Cultural Education Through Technology-Enhanced Learning.*

18:00-20:00 Session 5 – Visit Aristotle's Lyceum

It requires pre-booking

20:30-22:30 <u>Athenian Early Evening Symposium</u> (Sequence of Events: Ongoing Academic Discussions, Dinner, Wine and Water, Music, Dance)

Tuesday 19 May 2026

09:00-11:00 Session 6
Moderator: Larisa Rowe, Associate Professor, Connecticut State Community College, USA.

1. **Tonya Callaghan**, Professor, University of Calgary, Canada.
   Jamie Anderson, PhD Candidate, University of Calgary, Canada.
   ***Title**: Trans Teachers and the Politics of Presence in Anti-Trans Educational Policyscapes.*
2. **Silvana Watson**, Professor Old Dominion University, USA.
   Tara Donahue, Director, Traverse Bay Evaluation, Traverse City, USA.
   ***Title**: Moving the Needle: Professional Development that Transforms Instruction for Multilingual Learners.*
3. **Daniel Thomas III**, Assistant Professor, Texas A&M University, USA.
   Langston Clark, Interim Department Chair, Department of Interdisciplinary Learning and Teaching & Professor, University of Texas at San Antonio, USA.
   ***Title**: Curriculum-Making in Black Hands: Humanities Education in Black-Led Schools.*
4. **Sandra Styres**, Associate Professor, Ontario Institute for Studies in Education, University of Toronto, Canada.
   ***Title**: Radical Imagining Indigenous Education: Centering Land-based Practices in Transformative Education.*
5. **Fathi Shamma**, Lecturer, The Open University of Israel, Israel.
   Tali Heiman, Professor, The Open University of Israel, Israel.
   Dorit Olenik-Shemesh, Professor, The Open University of Israel, Israel.

***Title**: The Mediating Roles of Religiosity and Social Cohesion in the Relationship between Volunteering and Psychological Resilience among Arab Adolescents in Israel.*	
11:00-12:30 Session 7	
Session 7a **Moderator: Sandra Styres**, Associate Professor, Ontario Institute for Studies in Education, University of Toronto, Canada.	**Session 7b** **Moderator: Jianhua Yang**, Professor, Columbus State University, USA.
1. **Henri Pesonen**, Professor, University of Oslo, Norway. ***Title**: Early Childhood Education and Care Professionals' Descriptions of Challenging Situations in Norwegian Kindergartens: A Qualitative Pilot Study.* 2. **Yi Huang**, Executive Director, Center for Inclusive Excellence & Research Professor, Coppin State University, USA. ***Title**: Credential Innovations for Inclusive Excellence.* 3. **Duyen Le**, Research Associate, Green Project Management (GPM), USA. **Michael Pace**, PhD Candidate, University of Glasgow, UK. ***Title**: A New Framework for Transformative Learning in Project Management Education.* 4. **Yente Geelen**, Researcher, Netherlands Police Academy, The Netherlands. **Teun-Pieter de Snoo**, Researcher / PhD Student, Netherlands Police Academy, The Netherlands. **Larike Bronkhorst**, Associate Professor, Utrecht University, The Netherlands. ***Title**: Multiple Identities in Uniform: How Police Officers Navigate Roles, Decisions, and Lawful Conduct during Demonstrations.*	1. **Till Haenisch**, Professor and Head, Informatics Study Program, DHBW Heidenheim (Baden-Württemberg State University), Germany. **Anke Hutzschenreuter**, Professor, DHBW Heidenheim (Baden-Württemberg State University), Germany. ***Title**: Defining an AI-Literacy Course for Dual-Education Programs, Especially in Computer/Data Science: A Case Study.* 2. **Maria Krambia Kapardis**, Professor, Cyprus University of Technology, Cyprus. **Georgios Spanoudes**, Professor, University of Cyprus, Cyprus. ***Title**: Usefulness of AI Teaching Tools for Accounting Students.* 3. **Iyad Suleiman**, Lecturer, Tel Hai University, Kiryat Shmona, Israel. ***Title**: Potential Outcomes of Subsidized Medical Care: Evaluating Premature Birth Odds Ratios.*
12:30-14:30 Session 8	
Session 8a **Moderator: Yvonne Pratt-Johnson**, Professor, St. John's University, USA.	**Session 8b** **Moderator: Olga Gkounta**, Researcher, Athens Institute.
1. **Gulnur Ozbek**, Postdoctoral Research Associate, St. John's University, USA. **John Spiridakis**, Professor, St. John's University, USA. **Seokhee Cho**, Professor, St. John's University, USA. ***Title**: Longitudinal Engagement and Impact of the Advanced Dual-Certificate Professional Development Project LEADER.* 2. **Alice Tawany de Souza**, Graduate Student, Pontifical Catholic University of Minas Gerais (PUC Minas), Brazil. **Magali Reis**, Professor, Pontifical Catholic University of Minas Gerais (PUC Minas),	1. **Makoto Tatsuta**, Professor, National Institute of Informatics, Japan. ***Title**: Normal Cyclic Proof Theorem.* 2. **Honorato Ccalli Pacco**, Professor, Universidad Nacional de Jaén, Peru. ***Title**: Modeling, Simulation, And Control in the Kefir Fermentation System as a Function of Culture Concentration using Fuzzy Logic.* 3. **Mauro Pullin**, Adjunct Professor, University of Padova, Italy. ***Title**: Approximate Rectangular and Trapezoidal Integration, with*

Brazil.
Lenise Ortega, Professor, Pontifical Catholic University of Minas Gerais (PUC Minas), Brazil.
***Title**: From Inequalities to Critical Action: Rede Emíli@ and Public Policies for Early Childhood in Brazil.*

3. **Alina Romanovska**, Associate Professor, Daugavpils University, Latvia.
Dzintra Ilisko, Professor, Daugavpils University, Latvia.
***Title**: Non-Formal Education for Social Cohesion: A Theory of Change Approach to Museopedagogical Practice.*
4. **Dzintra Ilisko**, Professor, Daugavpils University, Latvia.
Alina Romanovska, Associate Professor, Daugavpils University, Latvia.
***Title**: Searching for Sustainability in Arts-Based Education: Insights from the Case Study Carried Out in a Non-Formal Educational Environment.*
5. **Dunja Dobaja**, Research Associate, Institute of Contemporary History, Slovenia.
***Title**: The System of Care and Education of Deaf Children in Slovenia in the Interwar Period, 1919–1940.*
6. **Shekitta Acker**, Director of Physician Assistant Program, Mayo Clinic, USA.
***Title**: Cognitive Test Anxiety in Health Professions Students.*

Implementation in the Java and Python Programming Languages.

4. **Florian Pramme**, PhD Student, Ostfalia University of Applied Sciences, Germany.
Tamás Kurczveil, Professor, Ostfalia University of Applied Sciences, Germany.
***Title**: A 5G Campus Network Architecture Enabling Cooperative V2X Communication for Autonomous Driving.*

14:30-15:30 Lunch

16:30-19:30 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 the Athens Institute exclusively for the conference participants.

20:30-22:30
An Ancient Athenian Symposium: Continuous Dialogues, Timeless Flavors (featuring authentic ancient Athenian dishes, local wine, and sweet delicacies from ancient Athens)

Wednesday 20 May 2026
An Educational Visit to Selected Islands
or Nafplio & Mycenae Visit

Thursday 21 May 2026
Visiting the Oracle of Delphi

Friday 22 May 2026
Visiting the Ancient Corinth and Cape Sounion

Saturday 23 May 2026
11:00-13:00 – The Academic Discussion continues in the downtown open agora (close to the Aristotelian Lyceum)
Refreshments are offered by the president of the Athens Institute. The purpose of this academic meeting is to engage in a comprehensive discussion regarding the future of education and research. click here for more details – *(Pre-booking is required and the event will only be held if a minimum number of participants is reached)*

Shekitta Acker
Director of Physician Assistant Program, Mayo Clinic, USA

Cognitive Test Anxiety in Health Professions Students

Statement of the Problem: High cognitive test anxiety can lead to academic performance concerns in students. This cross-sectional study investigated the distribution and relationship between cognitive test anxiety (CTA), academic resilience (AR), and the demographics of physician assistant (PA), nurse practitioner (NP), and physical/ occupational (PT/OT) students.

Methods: Students from seven universities across the United States were invited to participate in the study. Participants completed two validated surveys: Cognitive Test Anxiety Scale-2(CTAS-2) and Academic Resilience Scale (ARS-30) along with demographic-related questions. Responses were analyzed using one-way ANOVA, linear regression, and multiple linear regression.

Results: Two hundred and nine students were included in the final analysis [PA (65), NP (118), and PT/OT (26)]. Sixty-three percent of students in this study presented with moderate (41%) to high (22%) CTA. The prevalence of high CTA among physician assistants, nurse practitioners, and physical/occupational students was 8%, 30%, and 19%, respectively. Non-White students had a statistically significantly higher mean CTA score than White students ($p<.009$). There was no statistically significant difference in the CTA between students by program year, gender, or age. Forty-two percent of students presented with high AR among health professions There was no statistically significant difference in the mean AR between students by program year, gender, race, or age. A statistically significant negative correlation was seen between CTA & AR and CTA & current self-reported GPA/confidence levels of passing their licensure exam. While a significant positive correlation was observed between AR and confidence level of passing their licensure exam. AR explained 14.2% of the variance of CTA among students. In addition, about 11.5% variance in students' current self-reported GPA and 20% variance in the confidence levels of passing their licensure examination was explained by CTA and AR predictive model.

Conclusions: High CTA does exist in health professions students and may significantly impact their academic performance. Non-white students present with higher cognitive test anxiety than their white counterparts. With matriculation and retention rates among underrepresented minorities being a challenge, identifying students

early and finding interventions to improve students' academic success will be imperative.

Stephen Adofo
Researcher, University of Eastern Finland, Finland
Sirpa Kärkkäinen
Senior Lecturer, University of Eastern Finland, Finland
&
Jingoo Kang
Research Fellow, University of Eastern Finland, Finland

Mock Examinations in Science Under High Stakes Testing: Teachers' Perceptions, Practices, and Implications for Pedagogy, Equity, and Well Being

High-stakes testing through Ghana's Basic Education Certificate Examination (BECE) shapes instructional priorities. Schools widely use mock examinations to prepare learners the exams. This study examines junior-high science teachers' perceptions of mock examinations. We also examine effects on teaching, learning, and well-being. Four questions guided the inquiry on value, influence, preparation, and challenges. We conducted online semi-structured interviews with twelve criterion-sampled teachers. Interviews lasted thirty to forty minutes and were audio-recorded. Transcripts were anonymised and analysed using thematic analysis. Coder calibration, a decision log, consensus meetings, and team review strengthened credibility.

Teachers depicted mocks as rehearsal that enhances readiness and exam familiarity. Mock exams provided diagnostic feedback through script reviews and targeted reteaching. Motivation improved when feedback was constructive, timely, and solution focused. However, washback was ambiguous and often negative for pedagogy. Teachers reported accelerated pacing, topic targeting, and reduced practical and inquiry work. Preparation was intensive, with extended hours, extended days, and supervised study. Feedback windows were compressed with teachers marking at night and students lost sleep. Fee requirements and rural constraints introduced clear equity risks.

We recommend learning-oriented mock exams with Feed Up–Feedback–Feed Forward cycles. Post-mock practical or inquiry blocks are required to promote critical thinking. Fewer, well-spaced mock exams will allow feedback and recovery. Subsidising or capping fees and standardising mock exams and schedules will promote equity while reducing workload. Finally, BECE science requires revision to assess students' practical, critical, creative, and procedural competencies.

Noor Al-Najjar
Associate Professor, Sultan Qaboos University, Oman

From Planning to Practice: A Competency-Based Framework for Bridging the Theory–Practice Gap in Teacher Preparation

This paper proposes an applied, competency-based framework that transforms course planning in colleges of education into actionable teaching practices. Moving beyond descriptive discussions of course plans, the study introduces a structured implementation model that aligns learning outcomes, instructional strategies, assessment for learning, and reflective practice to real classroom demands. Using an analytical–developmental approach, the paper synthesizes contemporary literature, professional standards, and field-based insights to present practical mechanisms for strengthening pre-service teachers' readiness for authentic teaching contexts. The paper contributes a transferable framework suitable for professional development and curriculum reform initiatives.

Nava Bar
Lecturer, University of Haifa, Israel

Experiences and Inclusion Challenges of Novice Special Education Educators in Mainstream Schools in Israel

Over the past three decades, the Israeli education system has been engaged in implementing the inclusion policy for students with special needs in mainstream schools. This longitudinal qualitative study explored the perceptions of novice special education educators (NSEEs) throughout their induction year, focusing on the challenges they faced in promoting the inclusion of their students in school life and the nature of the support they received. Findings reveal that although NSEEs entered their role with strong ideals and motivation to assist, support, and integrate their students, they frequently encountered stigma, impatience, rejection, and lack of acceptance from principals and staff. These experiences left them frustrated and concerned about their students' well-being, while their limited status as newcomers hindered their ability to influence the situation. Moreover, their tendency to over-identify with their students blurred professional boundaries and undermined their capacity to provide effective support. A significant gap emerged between the humanistic, inclusion-oriented values emphasized during teacher education of NSEEs and the lack of knowledge and understanding of inclusion among mainstream educators. This tension also contrasted with the official national policy that mandates the implementation of inclusive practices in schools. The study contributes to the broader discourse on the responsibility of mainstream educators in integrating students with special needs. It also highlights the difficulties NSEEs encounter and the kinds of support they require from colleagues and administrators. Furthermore, it underscores the critical importance of cultivating collaboration, teamwork, and instructional skills within both teacher education programs and the broader educational system, all of which are essential for the successful inclusion of students with special needs.

Tamara Bell Boyle
Founder, Organization Hopemore International, USA

A Longitudinal Study: How Prepared Did Educators Feel they were, to Teach Virtual - Prior, During, and After the COVID-19 Pandemic Quarantine?

In March of 2020, to reduce and attempt to eliminate the spread of the coronavirus (COVID-19) many education institutions "almost overnight" (UNICEF, 2021) had to "suspend face-to-face teaching in schools" (Engzella, Freya, & Verhagena, 2021) following their government's mandate, for the safety of their citizens. Governments were following the advice and guidance of the Centers for Disease Control and Prevention (CDC), and the World Health Organization (WHO) (UNICEF, 2021). Nevertheless, students still needed to learn and teachers still needed to teach the students. However, how prepared did educators feel they were to teach virtual (i.e., asynchronous, synchronous, and simultaneous-synchronous-online)? This paper is a longitudinal study that examines educators' perspective on how prepared they felt they were to teach virtual prior to the COVID-19 pandemic quarantine (i.e., March of 2020) until the end of the academic year of 2021-2022 (i.e., June 2022). Three self-reporting questionnaires were posted on a social media platform to educators. Thus, taking their employer out of the equation. There were 20 participants who opened and completed the pilot questionnaire. Then 298 participants completed the self-reporting questionnaire, out of 299 who opened the self-reporting questionnaire. In addition, a last questionnaire was emailed to 126 of the 298 prior participants who said they would be interested in completing a follow-up questionnaire, in order to provide their perspective on how prepared they felt they were to teach during the academic year of 2021-2022 and their expectations for the 2022-2023 academic year. Ten emails were returned undeliverable. However, 44 educators completed the follow-up questionnaire. The respondents range from Pre-Kindergarten Teachers up to and including professors teaching PhD; and subjects ranged from general education to special education, from Family and Consumer Science to Advance Science including Chemistry, from Physical Education to Music. The following answers are some of the findings during the start of the COVID-19 pandemic quarantine. The participants were asked if the ever taught online. 33 participants stated they taught online, whilst 252 participants stated they have never taught online prior to COVID-19 pandemic quarantine. In addition, participants were asked "The training I received prior to the start of COVID-19 pandemic quarantine (i.e.,

March of 2020) prepared me." Out of the 288 responses 5.2% (15 participants) "Strongly Agree", 6.9% (20 participants) "Agree", 12.8% (37 participants) "Neither Agree nor Disagree", 21.2% (61 participants) "Disagree", 53.8% (155 participants) "Strongly disagree". The participants were also asked "Did your education institution have any kind of teaching, learning, and technology (TLT) center available to support you during the COVID-19 pandemic quarantine (i.e., March of 2020 until June 2020, the end of the US academic year of 2019-2020)?" Out of the 297 responses 35.7% (106 participants) answered "Yes", 16.8% (50 participants) answered "I have no idea.", and 47.5% (141 participants) answered "No". Please note, the same questions were asked each year—hoping for improvement. In addition, the questionnaire asked if the participants' schools had a plan during and if the school offered any training during the summers.

Tonya Callaghan
Professor, University of Calgary, Canada
&
Jamie Anderson
PhD Candidate, University of Calgary, Canada

Trans Teachers and the Politics of Presence in Anti-Trans Educational Policyscapes

Parental rights policies are being adopted widely across North America and take the form of book bans, restrictions on queer and trans-inclusive curriculum, and restricting the rights of Two Spirit, Lesbian, Gay, Bisexual, Trans, Queer, Intersex, and Asexual (2SLGBTQIA+) youth. Driving these policies are conservative Christian political movements that engage in what Rasmussen (2023) refers to as "heteroactivism," which is tied broadly to natalist concerns about the traditional family, parental rights, free speech, and removing diversity, equity and inclusion from public spaces. "Gender ideology," as they call it, is constructed as a common enemy. Concerned parents unite under the banner to protest inclusive sexual health education, 2SLGBTQIA+ educational initiatives, marriage equality, access to washrooms for transgender individuals, and more (Carnac, 2020; Corredor; 2019; Korolczuk & Graff, 2018). These moral panics are rooted in misconceptions about the development of sexual orientation and gender identity (SOGI) and discourses of childhood innocence that position queer and trans identities as something children need to be protected from. Within policy landscapes that intend to root out the presence of 2SLGBTQIA+ curriculum and supports, transgender teachers protected by employment legislation can make visible and present the possibilities of trans futures in schools. This paper examines the 2023-2025 education policy changes that regulate 2SLGBTQIA+ identities and content in schools in the Canadian provinces of Alberta and Saskatchewan.

Drawing upon Foucault's discourse theory, we analyze how power operates through language and normative constructions of identity (Foucault, 1980). Educational policies often reflect societal efforts to monitor and regulate individuals' identities, primarily through legislation and institutional norms that marginalize diverse expressions of gender (Foucault, 1990). In the current landscape of anti-trans policymaking, trans teachers emerge as "thorny bodies" within educational systems. Our presence serves as a defiant challenge to conservative agendas aimed at obliterating trans futures, embodying the possibility of such futures within the very institutions designed to

marginalize them. Critical queer theories provide a lens for tracing anti-trans discourses in Alberta and Saskatchewan to their antecedents to understand how they have been sedimented over time. This theoretical framework is also used to examine how trans teachers may be positioned to resist these policies as living proof of trans futures in an education system that seeks to limit them.

This paper offers "thorniness" as a framework for resistance. We consider how thorniness can be strategically leveraged to disrupt dominant narratives and practices that uphold anti-trans ideologies. Strategies such as malicious compliance can transform compliance into a form of resistance by exposing the contradictions within educational policies that seek to erase trans existence and refusing to be complicit with them. Furthermore, by embracing thorniness, trans teachers can resist the wave of epistemic violence emerging from legislated trans erasure and spoil the pursuit of cruel joy that stems from the intentional misrecognition of trans and nonbinary people.

Honorato Ccalli Pacco
Vice President for Research, National University of Jaén, Peru

Modeling, Simulation, and Control in the Kefir Fermentation System as a Function of Culture Concentration Using Fuzzy Logic

Kefir is a fermented beverage consumed worldwide for its numerous health benefits, as it contains high nutritional value, including proteins, minerals, and vitamins, and possesses anti-inflammatory and antioxidant properties. This research paper addresses the "Modeling, Simulation, and Control of the Kefir Fermentation System Based on Culture Concentration Using Fuzzy Logic." Pasteurized milk is cooled to the fermentation temperature, and then the kefir culture is added at three different concentrations. Fuzzy logic rules are used to determine the qualitative relationships between different variables, allowing for precise control of the fermentation temperature and time. The output variable is pH, which indicates the completion of fermentation for each treatment. Fuzzy logic controllers offer higher performance compared to other controllers.

Tya Collins
Assistant Professor, University of Ottawa, Canada

Who is Steering the Process? Governance and Loose Coupling in Special Education Placement

Globally, inclusive education is recognized as the prevailing approach to providing an equitable and accessible education for all students (Ainscow, 2020). In some parts of Canada, while notions of inclusion occupy significant space in educational policy, the dominant model for students with exceptionalities remains "special education," as is the case in Quebec (MEES, 2017). In this context, special education operates through a placement process that includes referrals from "regular" schools, the involvement of assessment professionals, reviews by placement committees, and a decision-making phase determining whether students are identified as having "special needs," followed by the mobilization of support services and/or placement options (Collins & Corri-Anadon, 2021; MELS, 2007). These placement decisions carry significant consequences for students' academic trajectories, access to support, sense of belonging in school, and achievement (Collins & Borri-Anadon, 2021; Korpershoek et al., 2020). Although scholars such as Harry & Klingner (2022) have illuminated how professional beliefs, cultural logics, and institutional practices shape special education decisions, comparatively little empirical work has traced how placement processes are coordinated across multiple institutional sites or how members of school personnel understand their roles within them.

Using Institutional Ethnography (Campbell & Gregor, 2004; Smith & Griffith, 2022), this study examines how the special education placement process is socially organized from the standpoint of school personnel in Quebec, Canada, whose daily work activates, interprets, and navigates it. Drawing on qualitative data from a multi-site study involving interviews and focus groups with 21 members of school personnel (administrators, teachers, behavioural technicians, guidance counsellors, and placement committee members), the analysis reconstructs the placement process as experienced in personnel's practice. The findings show that while policy documents depict placement as a clear sequence of identification, committee review, and assignment, participants describe a process marked by uncertainty, role confusion, and fragmented understanding and communication. "Regular" school personnel tend to describe placement committees as the authoritative decision-makers; "special" school personnel assume committees evaluate student needs and determine the appropriateness of special

school placement; and placement committee members characterize their work primarily as facilitating transitions after decisions have already been made. Findings suggest that the placement process operates as a loosely coupled system, in which institutional actors are formally connected yet work with limited shared visibility of roles, information, and decision authority, creating "blind zones" that hinder smooth transitions and consistent support for students. Building on these insights, the presentation will conclude by discussing what these dynamics mean for students' experiences of transition and support, and how coordination across the placement process might be strengthened.

Eleni Coukos Elder
Professor, Tennessee State University, USA
&
Patrice Elder
Educational Consultant, Tennessee State University, USA

Toxic Behaviors in Higher Education Institutions: Examining Demographic Factors Affecting Faculty Perceptions

Toxic behaviors within academic institutions are increasingly recognized as detrimental to faculty well-being, productivity, and institutional culture. These behaviors, characterized by incivility, bullying, microaggressions, and other forms of interpersonal conflict, are shaped by complex demographic, cultural, and institutional factors (Gadegaard et al., 2019). Understanding how demographic characteristics influence faculty perceptions of organizational toxicity is crucial for developing effective interventions and creating more inclusive academic environments. Organizational toxicity is defined as situations that reduce employee morale, motivation, self-esteem, and diligence, resulting in emotional pain and permanent damage to organizations (Frost, 2003; Maitlis, 2008). According to the American Psychological Association (2023), 19% of workers describe their workplace as toxic, with those in toxic environments being three times more likely to experience mental health harm compared to those in healthy workplaces. In higher education, toxic behaviors manifest through various forms including narcissistic leadership, aggressive interpersonal dynamics, unethical conduct, and rigid organizational structures. These behaviors can significantly impact faculty retention, job satisfaction, and overall institutional effectiveness (Kasalak, 2019). The unique context of higher education, with its tenure systems, academic hierarchies, and competitive environments, may exacerbate these toxic dynamics.

This quantitative study examined the relationship between demographic factors and faculty perceptions of organizational toxicity at four-year higher education institutions. Using the *Perceived Organizational Toxicity Scale (POTS)*, data were collected from 131 faculty members across Predominantly White Institutions (PWIs) and Historically Black Colleges and Universities (HBCUs). The study investigated four dimensions of toxic behaviors: narcissistic, aggressive, unethical, and rigid behaviors. Key findings revealed that unethical behaviors were the most prevalent form of organizational toxicity (M = 2.59, SD = 1.05), followed by narcissistic behaviors (M = 2.32, SD = .93). Significant demographic differences emerged across academic rank and seniority. Assistant and associate

professors reported significantly higher levels of aggressive behaviors (M = 2.51) compared to research assistants and adjunct professors (M = 2.03), $F(2) = 3.28$, $p = .041$. Faculty with 6-10 years of experience reported the highest toxicity levels, while those with two years or less reported the lowest levels. Faculty with greater seniority showed significantly higher perceptions of unethical behaviors, $F(3,127) = 4.88$, $p = .003$. Racial differences were also significant, with White faculty reporting higher levels of unethical behaviors than Black faculty, $F(2,128) = 3.09$, $p = .049$. The findings demonstrate that organizational toxicity is a systemic issue affecting faculty across all demographics, with unethical behaviors representing the most significant concern.

Alice Tawany de Souza
Graduate Student, Pontifical Catholic University of Minas Gerais (PUC Minas), Brazil
Magali Reis
Professor, Pontifical Catholic University of Minas Gerais (PUC Minas), Brazil
&
Lenise Ortega
Professor, Pontifical Catholic University of Minas Gerais (PUC Minas), Brazil

From Inequalities to Critical Action: Rede Emíli@ and Public Policies for Early Childhood in Brazil

The research began in 2018, was institutionalized in 2020, and remains active in the areas covered by Rede Emili@. This research consists of an analyzes of the role of research networks in building critiques of public policies for comprehensive childcare in Brazil, focusing on the experience of the Rede Emíli@ (PUC Minas). The study is based on a case study that brings together research on childhood in different contexts, especially in the Amazon region, and on the understanding of the limits and possibilities of policies aimed at combating educational inequalities, which were accentuated during the COVID-19 pandemic and whose effects are still felt in the country. In the Amazonian context, structural obstacles stand out, such as poor connectivity, lack of school infrastructure, and shortage of professionals, which have worsened the exclusion of young children. The pandemic has revealed these inequalities even more intensely, as emergency remote teaching and social support programs proved insufficient to guarantee equity in access and quality of care. National programs aimed at early childhood were critically analyzed, identifying weaknesses in the integration between education, health, and social assistance, as well as gaps in listening to and engaging communities. Although there have been advances, persistent implementation problems limit the scope of actions and reduce their transformative impact. Rede Emíli@ has played a relevant role by producing critical evidence, fostering interdisciplinary debate, and bringing together researchers and communities, thus contributing to the improvement of public policies. The network's experience shows that collaborative initiatives can strengthen not only scientific production but also the formulation of policies more attuned to the needs of children in vulnerable situations. Finally, we understand that research networks, such as Rede Emíli@, are essential tools in the critical analysis of public

policies aimed at childhood, providing theoretical and practical contributions to face structural and emergency challenges.

Elizabeth Diaz
Associate Professor, University of Texas at Arlington, USA

miABCTamil: Bridging the Digital Divide in Tamil Language and Cultural Education Through Technology-Enhanced Learning

This presentation introduces miABCTamil, an innovative educational application designed to address the critical digital breach in Tamil language and cultural learning resources for young learners and heritage language students. As one of the world's oldest classical languages with over 2,000 years of literary tradition, Tamil faces challenges in engaging digital-native generations, creating an urgent need for technology-enhanced pedagogical tools that honor linguistic heritage while embracing modern learning methodologies.

miABCTamil comprises ten comprehensive learning modules systematically designed to build Tamil language proficiency and cultural awareness: Tamil Alphabet, Tamil Sounds (phonetics), Tamil Colors, Geometric Figures in Tamil, Numbers in Tamil, Festivals, Write, Words, Complete and the flagship "I Can Read in Tamil" module. The application features dynamic vocabulary management through a dedicated module, Words, for adding new words and editing existing words, enabling personalized and evolving learning content tailored to individual learner needs. The Festival module enriches cultural understanding by showcasing the top ten festivals of Tamil Nadu, complete with traditional foods and customary clothing, connecting language learning to lived cultural experiences and strengthening cultural identity.

The application's innovative architecture integrates seamlessly with its sister platform, miabc online, enabling educators and parents to input custom texts that are processed through Bloom's Taxonomy-based technology. This integration automatically generates comprehension questions at varying cognitive levels—from basic recall and comprehension to application, analysis, and evaluation—creating personalized, scaffolded learning experiences that adapt to individual student progression and learning styles.

By combining systematic language instruction, cultural immersion, customizable vocabulary development, and AI-driven question generation, miABCTamil demonstrates how ancient languages can thrive in digital learning environments while preserving cultural identity for future generations. This presentation will showcase live

demonstrations, discuss pedagogical outcomes, and explore implications for heritage language education globally.

Dunja Dobaja
Research Associate, Institute of Contemporary History, Slovenia

The System of Care and Education of Deaf Children in Slovenia in the Interwar Period, 1919–1940

The system of care for sensory-impaired children and their education in Slovenia has not previously been the subject of historical research. This motivated me to study this topic. I focus primarily on the system of care for deaf children and their education in Slovenia during the interwar period, as the so-called Gluhonemnica (school for deaf children) in Ljubljana was, at that time, the only institution for the education of deaf children in Slovenia. Education was conducted using the speech-based method (the oral method), which in this period in Slovenia and more broadly in Yugoslavia represented a path toward the integration of deaf people into society—that is, toward independent adult life and, for many, also a way out of poverty, since most deaf children came from poor families.

My contribution presents this topic within the Yugoslav context and finds that during the interwar period the foundations were laid for the education of deaf children after the Second World War in Slovenia and Yugoslavia. It concludes that education using the oral method in Slovenia was, in broader terms, successful, as confirmed by final learning outcomes. The oral method was used in Slovenia until the 1980s. According to the opinions of today's experts, this teaching method was unsuitable for the individual development of children. I do not address these issues, as I am not a specialist in this field.

At the same time, my contribution presents the education of teachers of the deaf, their contacts with other European institutions, the feelings of children in the learning process, their everyday lives, the integration of children into society after the completion of schooling, and society's attitude toward these children. It finds that after the Second World War there was continuity in Slovenia not only in the methodology of teaching deaf children, but also in a segregative attitude toward deaf children and children with special needs in general, in terms of spatial segregation and the treatment of these children as a social problem. In this respect, the new communist authorities immediately after the Second World War did not represent a break with the old system. The medical model of dealing with children with special needs continued to prevail.

Ayman Eldeib
Associate Professor, Southern New Hampshire University, USA
Austin Bryan
Student, Southern New Hampshire University, USA
&
Mohamed Saad
Associate Professor, Minia University, Egypt

Genomic Analyzer: A Scalable and High-Performance Object-Oriented Application for SNP Analysis and Genetic Association Studies

Bioinformatics flourished in the biological and medical fields in the last decade by making use of the exponential growth in computer science expertise. It makes use of the available large datasets through big data analysis. Bioinformatics has many subcategories. One of the main subcategories is genomics that deals with Deoxyribonucleic acid (DNA). Single Nucleotide Polymorphism (SNP) is the most common type of genetic variation among people, where a single building block of DNA (a nucleotide) is different from the reference sequence. These variations are found in at least 1% of the population and can serve as biological markers, influencing disease risk, how a person responds to certain drugs, and their susceptibility to diseases like diabetes and heart disease. SNPs are required as the main input for Genome-Wide Association Study (GWAS) where the correlation between SNPs and phenotypes is demonstrated. This correlation is important for many medical fields such as disease susceptibility, disease progression, survival period, and drug response.

The human genome sequences have brought a wealth of data on genetic variation in the form of single nucleotide polymorphisms (SNPs). Recently, the steady accumulation of data from human genome sequencing studies has exposed a strong need for faster and more scalable implementations of key functions such genetic association. These data are accessible through public databases for students and researchers. This paper presents a new software application concerned with SNP analysis that has three main features: 1) is a bioinformatics tool for students/researchers to explore SNP datasets and extract information from data files; 2) to standardize the SNP datasets, which come from various resources with extremely different formats to be ready for further analysis. The meaning of standardization here is not an international standardization but a standardization for the tool itself. 3) to apply different association models such as multiplicative, dominant, recessive, and codominant models to check the correlation between the

SNP and the phenotype. It exports results in the selected visualization format such tables and graphs and provides detailed comparison between results of different association models.

This application is developed using object-oriented programming concepts to enable plug-and-play architecture and to support scalability, thereby facilitating the seamless integration of new techniques and to facilitate genomic analysis including genetic association studies that offer dramatic improvements in performance and compatibility.

Stavros Georgakopoulos
Distinguished Professor, Florida International University, USA
Constantinos L. Zekios
Assistant Professor, Florida International University, USA
&
Ricardo Sendrea
PhD Candidate, Florida International University, USA

A Multi-Fidelity Deep Learning Framework for Robust Computational Imaging

Computational imaging systems are increasingly used in sensing and diagnostic applications, but their underlying reconstruction problems remain challenging because they are highly nonlinear, sensitive to noise, and often dependent on large amounts of high-quality training data. These challenges become even more pronounced when measurements are limited or when test scenarios differ from those seen during training. To address this issue, this paper presents a multi-fidelity deep learning framework that combines physics-based modeling with data-driven refinement. Instead of relying solely on direct end-to-end prediction, the proposed approach begins with a low-fidelity reconstruction and improves it through a stacked neural-network architecture that also incorporates measured field information. The central idea is to treat low-fidelity reconstructions as structured prior information and then learn how to refine them toward higher-quality solutions. This strategy preserves useful information from conventional model-based imaging methods while also leveraging the pattern-learning capability of deep neural networks. The framework is inspired by multi-fidelity learning methods widely used in computational modeling and adapts them to image reconstruction through stacked U-Net-type subnetworks designed to capture complementary correction behavior. The proposed method is evaluated using representative soft- and hard-scattering scenarios with synthetic data. The results show accurate recovery of hidden dielectric profiles, including challenging out-of-distribution cases and noisy measurement conditions. In the tested scenarios, the framework achieves reconstruction errors below 10% while maintaining performance comparable to established supervised correction models. These results suggest that multi-fidelity learning can improve robustness and generalization in computational imaging without requiring fully data-intensive end-to-end training approaches. Overall, this work demonstrates how domain knowledge, approximate physical reconstructions, and deep learning can be integrated into a unified

computational framework for robust image reconstruction. From an information technology and computer science perspective, the contribution lies in showing how multi-fidelity machine learning can support reliable inference in imaging problems where data are scarce, noisy, or expensive to obtain. This approach points to a promising direction for future intelligent imaging and sensing systems that demand both computational efficiency and strong generalization. This work was supported by the U.S. Air Force Office of Scientific Research under Grant No. FA9550-21-1-0309.

Hamid Farrokh Ghatte
Assistant Professor, Antalya Bilim University, Türkiye
Seyed Mohammad Amin Abtahi
Assistant Professor, Antalya Bilim University, Türkiye
&
Muzaffer Koc
Assistant Professor, Antalya Bilim University, Türkiye

AI-Driven Multi-Modal Assessment of Building Vulnerability in Seismic Zones

Among the persistent challenges in the civil engineering the field, the realistic and scalable assessment of individual building vulnerability is a critical condition across large urban building stocks. This issue is particularly acute in seismic regions where existing structures do not conform to current seismic design codes. The last earthquake in Turkiye (2023, M7.8 and M7.4) claimed over 50,000 lives and damaged more than 160,000 buildings, highlighting critical gaps in seismic vulnerability assessment. Traditional and Conventional seismic vulnerability assessment techniques are often slow, labor-intensive, and lack the scalability required for timely disaster risk management. In general, it can be reported that as the seismic evaluation method gets more detailed and complicated (as in the case of code-level methods), the accuracy of the technique increases. This paper presents a multi-modal AI framework designed for rapid and automated evaluation of building seismic vulnerability. A notable innovation is the incorporation of a speech-to-speech Voice AI module, enabling hands-free, real-time data collection in the field. Empirical evaluation conducted on a dataset of buildings in Türkiye demonstrates that the presented model achieves a high recall in identifying collapsed structures, significantly outperforming traditional rapid visual screening methods in both speed and accuracy. The system enables comprehensive city-wide screening using non-experts, supporting proactive seismic safety. Therefore, the system can present a management and strategic resource allocation for building retrofitting and industrial facility protection. This technological advancement empowers engineers and policymakers with various tools for evidence-based seismic risk management, moving from reactive to proactive infrastructure protection strategies.

Bujar Gallopeni
Assistant Professor, International Business College Mitrovica, Kosovo

Perceived Safety, Risk, and Violence Exposure among Schoolchildren: A Psychosocial Analysis of Factors Shaping School Safety

School safety is a prerequisite for quality education and child well-being. In Kosovo's post-conflict educational context, violence and bullying remain significant threats, yet little is known about how students' perceptions of safety, risk, and exposure to violence jointly shape their overall sense of security. This study examines interrelations among perceived safety, perceived risk, and violence exposure; tests their predictive power for students' overall safety; and explores group differences by gender, grade level, and settlement area.

A cross-sectional quantitative survey was conducted with 299 students from Grades 6–12 across 20 public schools in Kosovo, following a convenience sampling approach. Data were analysed using SPSS 26, applying descriptive statistics, reliability testing (α = .73–.93), Pearson correlations, multiple regression, and ANOVA to examine relationships and group effects.

Higher perceived safety was associated with lower perceived risk and violence exposure. Regression results indicated that situational safety and interpersonal violence exposure significantly predicted overall safety perceptions (R^2 = .34). ANOVA revealed that female and older students reported higher perceived risk and exposure to violence, while younger and male students felt safer. No significant differences emerged by settlement area.

Findings confirm school safety as a multidimensional psychosocial construct shaped by both perception and experience. Policy actions should prioritize psychosocial support, teacher training, and gender-sensitive prevention programs to strengthen emotional security and inclusive learning environments.

Yente Geelen
Researcher, Netherlands Police Academy, The Netherlands
Teun-Pieter de Snoo
Researcher/PhD Student, Netherlands Police Academy, The Netherlands
&
Larike Bronkhorst
Associate Professor, Utrecht University, The Netherlands

Multiple Identities in Uniform: How Police Officers Navigate Roles, Decisions, and Lawful Conduct during Demonstrations

Police officers operating during public demonstrations must simultaneously safeguard democratic rights and maintain public order in increasingly polarized and highly visible environments. These conditions require officers to navigate multiple, sometimes conflicting identities shaped by personal characteristics, cultural backgrounds, group memberships, and professional role expectations. This study investigates how police officers negotiate these multiple identities during demonstrations, and how such identity dynamics influence their decision-making and lawful conduct.

Using a constructivist, exploratory qualitative design, the research integrates participatory observations with semi-structured dialogical interviews. Seventeen Dutch police officers participated in interviews, of which seven were analysed in depth using a narrative-analytic framework grounded in Dialogical Self Theory. This two-layered analytic approach combined narrative reconstruction with thematic synthesis to preserve individual voice while identifying cross-case patterns.

Findings show that police officers do not enact a singular "police identity"; instead, they draw on six recurrent identity dimensions: Relational Connector, Guardian of Peace & Rights, Boundary Setter & Enforcer, Strategist & Knowledge Seeker, Reflective Professional, and Commanding & Task-Focused Officer. Officers moved fluidly between these dimensions in response to situational triggers. Five triggers were identified as catalysts for identity shifts: aggression, administrative authority overrules, personal attacks, overstepping boundaries, and gut feelings informed by experience. These transitions demonstrate that identity navigation in policing during demonstrations is dynamic, situational, and dialogically negotiated.

The narratives also revealed persistent dilemmas arising from tensions between officers' personal beliefs, cultural or religious

backgrounds, and the professional expectation of neutrality. While officers framed neutrality as a core professional standard, their accounts showed that neutrality is aspirational rather than absolute, as personal sympathies, affective responses, and background-based vulnerabilities surfaced in practice.

Decision-making was described as shaped by hierarchical directives, operational frameworks, and officers' own situational judgments. Officers alternated between obedience to orders and selective discretionary action, reflecting the interplay of Street-Level Bureaucracy and identity negotiation. Lawful conduct was anchored in legal frameworks such as the Police Act, use-of-force protocols, and proportionality principles, yet officers frequently relied on relational and strategic identities to interpret and enact these rules in practice. The findings show lawful conduct to be not merely procedural compliance but an identity-mediated process balancing care, proportionality, and enforcement.

This study contributes a conceptual framework for understanding identity navigation in high-stakes policing and extends identity theory into the context of public order management. Practically, the findings highlight the need for training that addresses identity negotiation and the emotional labour of policing demonstrations. The study underscores that police officers act as reflective, relational, and strategic agents whose identity work shapes both decision-making and lawful conduct during demonstrations.

Ulrika Gidlund
Senior Lecturer, Mid Sweden University, Sweden
&
Lena Ivarsson
Lecturer, Mid Sweden University, Sweden

Students with Special Educational Needs – Discourses and Practice in Movement

Inclusive Education (IE) and Special Education Needs (SEN) are intertwined by the question of how and where to educate students in need of educational support. In Sweden, IE has been a word of honour, a concept you cannot be against. When the philosophical rhetoric of IE meets the reality of everyday life in Swedish schools something has happened with the glory of the concept. After some 30 years with IE in Sweden, the discourse has been in motion in different ways and within different groups, eg Curriculum (Skolverket, 1994; 2011; 2022) legal and school policy documents school leaders, teachers, teacher union, parents, students. There have also been changes in how to arrange the physical environment for students with SEN, e.g. where to teach the student - special schools/groups or regular classroom, and by whom – the regular classroom teacher or special teacher. The theory that frames this study is Ainscow's (1998) perspective on special education needs; the traditional or the alternative perspective, and in a Swedish context Nilholm's (2005), theoretical translation of these perspectives. The overall aim of this study is to investigate the motion of the discourse of students in need of educational support - SEN in comparison to IE. The study seeks to find out how the discourses has change, what are the reasons for these changes, what are the consequences of these reasons and changes, and what political/policy reforms are suggested to meet the 'new' discourses of SEN and IE? In this case study, the data materials used were national policy and legal documents, international peer reviewed articles, interviews with teachers, and reports from Swedish Teacher Unions and national media. The data were analysed deductively in two different domains: Policy and Practice. The categories in each domain were then analysed inductively linked to the statements of the data itself in relation to SEN and IE. The preliminary results indicate that a shift in discourse from SEN to IE was due to the Salamanca statement (Unesco, 1994) and has resulted in a change in school organisation. This change, is alleged to have resulted in frustrated and disappointed teachers, decrease in students' and teachers' wellbeing, which has had consequences such as teacher shortage. There has also been high increase in student diagnosis

(e.g. ADAH), and a noisy and chaotic classroom climate, which are seen as a major reason for students 'mental ill-being and problematic school absenteeism (de Boar et al., 2011). Additionally, the decline in Swedish students' learning outcomes (as measured by PISA, TIMMS, and PIRLS) is attributed to this. Consequences of this situation are a new change in discourse, which has led to a range of new/old reformations carried out by school expert appointed by the government. Reforms such as abolish the category 'special adaptation' within the regular classroom, open new/old special education schools and groups, and focuses on more firm and severe classroom behaviour, are some of these.

The overall conclusion is that changing the mind-set of a whole school organisation requires more than philosophical and ideological words, regulations and standards. It requires a thorough evaluation of what is doable and what is not – and how. You cannot be *against* inclusion! It is a concept of honour with its core in human rights. But how policy makers interpret and then implement the concept in school reality form the discourse.

Till Haenisch
Professor and Head, Informatics Study Program, DHBW Heidenheim (Baden-Württemberg State University), Germany
&
Anke Hutzschenreuter
Professor, DHBW Heidenheim (Baden-Württemberg State University), Germany

Defining an AI-Literacy Course for Dual-Education Programs, Especially in Computer/Data Science: A Case Study

Generative AI, especially Large Language Models, has the potential to transform learning and evaluation processes. However, institutions often focus primarily on regulations to guarantee academic integrity rather than on enabling effective use.

This paper addresses three key questions arising when deploying generative AI in the classroom: (1) How can we teach students the skills necessary to use LLMs effectively for learning? (2) How can we establish a code of conduct that complies with university regulations while gaining student acceptance? (3) How can we bridge the gap between students' industry experience with AI and academic expectations?

We present a three-day AI literacy curriculum developed at DHBW (Duale Hochschule Baden-Württemberg) covering technical, practical, and legal aspects. The first part introduces AI fundamentals, including neural network and transformer architectures, as well as applications such as RAG systems and agentic AI. The second part is program-specific, addressing practical applications like AI-assisted scientific writing or code generation. The third part covers compliance topics including copyright, examination law, and university regulations, concluding with a community-based process for developing a code of conduct.

DHBW's dual-education model, where students alternate between university and industry partners, presents unique challenges: students bring extensive real-world experience using generative AI for tasks like software development and presentation preparation. This expertise makes predefined rules difficult to enforce and renders fixed curricula impractical. We therefore adopted an inclusive, community-based approach to developing guidelines—an approach that has proven effective in gaining acceptance.

By examining benefits and challenges, including academic integrity and accessibility, this paper provides a foundation for discussions about AI integration in higher education. The curriculum is designed to be

adaptable to other programs such as business administration, IT security, or mechanical engineering, and can be implemented as a Micro-Credential.

Jingzi Huang
Professor & Associate Dean, College of Education and Behavioral Sciences, University of Northern Colorado, USA

Connecting Program Assessment of Teaching Talent Training in Higher Education to the Reality of the Schools: A Case Study of Assessment Development for a Teacher Preparation Program

Among existing research studies regarding the evaluation of teacher preparation programs (TPPs), attention has been given to "the strengths and weaknesses of evaluation metrics based on rigorous criteria for accuracy and utility", which has alerted researchers to argue for strong equity to be established as an explicit goal and a desired outcome of teacher preparation evaluation (Cochran-Smith & Reagan, 2021). Meanwhile, in the context of the current broader accountability movement in education, it has become obvious that the evaluation of a TPP needs to be tied to the evaluation of its graduates by the school leaders in the reality of the field. Limited studies suggest that connecting TPP evaluations to evaluation rating of graduates is a promising development for program accountability and improvements. At the same time, as pointed out by Bastian *et al* (2017), if the TPP evaluation systems do not take school context into consideration, then the graduates who disproportionately work in high-need schools are likely to be rated lower than if such systems account for employment context.

For a TPP at the operational level, how to connect its assessments to candidates' performance in the field seems to be more relevant to program improvement for addressing the needs in the field. The current study tries to make contributions to the topic by examining how a TPP in an American university developed and implemented a program level assessment system that connects its TPP evaluation to the evaluation of its graduates by the school leaders in the context where cultural and linguistic diversity (CLD) in the school settings is the norm.

Two sources of data were used for this case study. One comes from the assessments developed and implemented by the concerned EPP. An electronic data management system specifically designed for TPPs in the nation, with the capability to tie specific performance indicators to the required standards when aggregating data, was used for data collection and aggregation. A second source of data is from the state's Department of Education, which provides comprehensive annual EPP data regarding all EPPs in the state. The relevant data used for the current study is regarding the employment context of the graduates and the evaluation

rating of new teachers by the school leaders. Collected data were analyzed and compared in the context of schools to identify strengths and weaknesses of the teaching talents prepared by the concerned EPP for the CLD reality of the schools.

The findings of the study show that it is possible to connect a TPP's evaluation system to how future employers evaluate its graduates. Additionally, equity needs to, and can be, intentionally taken into consideration for assessment design/implementation as well as data analysis so that assessment results can more meaningfully direct program improvement. Although the study is based on the situation in the United States, it is an international phenomenon that classroom teachers are facing ever increasing diversity in their k-12 classrooms. Thus, the study offers implications beyond the United States.

Yi Huang
Executive Director, Center for Inclusive Excellence & Research Professor, Coppin State University, USA

Credential Innovations for Inclusive Excellence

The Center for Inclusive Excellence (CIE) at Coppin State University aims to simultaneously improve the quality and value of education while increasing access and success through credential innovation. This presentation spotlights CIE's **stackable credentials**, uniquely engineered as model *career ladders* to improve teacher effectiveness, increase teacher retention, and accelerate teacher leadership development. These innovative pathways provide educators with both the short-term advantage of earning one or more post-baccalaureate certificates and the longer-term option of earning an advanced master's degree with salary incentives and national prestige (Huang, 2022). The five stackable credentials include: Master of Education in Teacher Leadership; Teacher Leadership in Culturally Sustaining Practices (Post-Baccalaureate Certificate); Teacher Leadership in High-Tech and High-Impact Practices (Post-Baccalaureate Certificate); Teacher Leadership in Action (Post-Baccalaureate Certificate); and Contemporary Teacher Leadership (Post-Baccalaureate Certificate).

Supported by strategic partnerships and large-scale federal funding, the stackable credentials were launched in Fall 2023 at no cost to participating educators. The initiative is implemented through a rural–urban network that includes two institutions of higher education and four high-need school systems across the state of Maryland. The CIE Executive Director and Principal Investigator will share strategies, progress, and challenges related to academic policy alignment, curriculum engineering, partnership development, innovative instructional delivery, and competency-based assessment, as well as funding structures, scalability, and sustainability.

The presentation will first examine five strategic principles that guide credential innovation: (1) tri-sector partnerships supported by strategic funding models; (2) innovative program engineering that breaks through academic and institutional boundaries; (3) dynamic experience models that address geographic and instructional constraints; (4) interagency accountability using common processes, expectations, and measures; and (5) a statewide networked improvement community that builds capacity while supporting teacher effectiveness, retention, and career advancement. Together, these principles form the foundation of the credential ecosystem.

The session will further share program engineering and implementation processes, along with learning outcomes data from the first two years of operation. Evidence will include competency evaluation results, course completion data, participant and instructional team surveys, and findings from external evaluation focused on progress, products, and outcomes. Early results highlight strong rates of competency mastery across credential pathways and emerging evidence of improved retention. Finally, the presentation will discuss lessons learned and promising practices, and will explore the scalability of competency-based, stackable credential pathways in response to rapidly changing workforce needs and evolving educational and employment ecosystems for inclusive excellence.

Dzintra Ilisko
Professor, Daugavpils University, Latvia
&
Alina Romanovska
Associate Professor, Daugavpils University, Latvia

Searching for Sustainability in Arts-Based Education: Insights from the Case Study Carried Out in a Non-Formal Educational Environment

The current discourse in education suggests that arts-based education has been ignored in mainstream education. Arts-based education takes many forms and fosters youth-centred creative self-expression and community cohesion through powerful learning experiences.

The study presents a case study carried out within the framework of the "The Horizon Europe" program's project "The Cultural Literacies' Value in Europe" (CLiViE), "(grant agreement No. 101132285)." aiming to foster holistic education for youth by fostering creativity and social cohesion through art-based approaches.

The methodology used in this study involves interviews with art experts and artists on the challenges and opportunities of arts-based informal education in unleashing the creative potential of youth and building cohesion.

The study reveals that arts-based learning also fosters sustainability learning through the use of sustainable materials in the arts, reimagining a more sustainable future; thus, art becomes an efficient means for reinventing, redesigning, and re-envisioning alternative futures. Unsustainable practices, characterised by consumer behaviour, place an imperative for sustainable development, particularly within the educational sphere. Therefore, arts-based education fosters sustainability thinking and acting by fostering learners as agents of sustainable change in their everyday practice.

It was concluded that the arts can be an efficient means for reinventing, redesigning, and re-envisioning alternative futures and for learning the values of accepting Otherness in the Arts. Thus, learners expand their consciousness not only towards the acceptance of the Other but also towards the non-human world.

Sabine Khalil
Associate Professor, Illinois State University, USA
&
Bahae Samhan
Associate Professor, Illinois State University, USA

User Adoption of Augmented Reality Exhibitions: Insights from a U.S. Study

In recent years, interactive museums have grown in popularity, particularly during the COVID-19 pandemic. Notably, this trend has continued even as the pandemic receded, with museums increasingly adopting Augmented Reality (AR) technologies. AR has become an essential tool, not only transforming various sectors but also showing great potential for enhancing the tourism experience. This study investigates how museumgoers in the United States (US) are embracing AR, with the goal of enriching their engagement and responding to ongoing digital transformations. By applying the Technology Acceptance Model (TAM) framework from Khalil et al. (2024), we conducted a survey of individuals who had visited interactive museums in major US cities such as Los Angeles, New York, Seattle, Chicago, and Sacramento. Structural Equation Modeling (SEM) was used to analyze the data and identify patterns of AR adoption. While some of our results align with Khalil et al.'s findings from France, notable differences emerged in the behavior and preferences of US museum visitors. These discrepancies underscore the importance of regional and cultural factors in technology adoption, suggesting that AR implementation strategies may need to be tailored to local contexts. Furthermore, the study highlights the role of AR in shaping the future of museum experiences, potentially attracting a wider audience, and driving innovation in the cultural sector.

Arie Kizel
Professor, University of Haifa, Israel

Expanding Buber's I-Thou to I-Virtual Space-Thou in Students' Relations

This presentation explores the philosophical dimensions of adolescent communication in virtual spaces, examining how young people experience and construct meaning within WhatsApp communities. Moving beyond conventional research that treats technology merely as a communication medium, this study proposes that we are witnessing a fundamental transformation in human subjectivity due to technological interaction. The research argues that digital platforms function as philosophical factors that actively reshape young people's self-perception and interpersonal relationships.

The study reveals that adolescents experience virtual spaces in ways that remarkably parallel Martin Buber's concept of "I-Thou" relationships. Participants consistently describe WhatsApp; Philosophy with Children; Marin Buber; I-Thou WhatsApp as enabling authentic, intimate dialogue while providing psychological safety. They reported that the virtual environment allows for more personal disclosure than face-to-face interactions, creating opportunities for genuine encounter and mutual recognition.

The research demonstrates that these virtual communities function as dialogical spaces in the Buberian sense, facilitating true community formation based on living, reciprocal relationships. Participants experienced the WhatsApp environment as enabling breakthrough from individualistic isolation, allowing them to explore fundamental questions about human nature and relationships.

The study reveals that WhatsApp communities serve quasi-therapeutic functions, providing emotional support and practical guidance for adolescents facing various challenges. Unlike school environments that emphasize evaluation and categorization, these virtual communities offer non-judgmental spaces where vulnerability and authenticity are welcomed and supported.

The research findings suggest expanding Buber's dialogical philosophy to accommodate contemporary technological reality. Rather than viewing virtual space as separate from human relationships, this study proposes an "I-Virtual Space-Thou" model that recognizes technology as integral to modern relational experience. Virtual space becomes not merely a conduit for communication but a constituent

element of the encounter itself, enabling forms of dialogue and intimacy that may be impossible in purely physical contexts.

Maria Krambia Kapardis
Professor, Cyprus University of Technology, Cyprus
&
Georgios Spanoudes
Professor, University of Cyprus, Cyprus

Usefulness of AI Teaching Tools for Accounting Students

Traditional teaching of financial accounting is complicated due to old-age methods of teaching, simplistic methods of education, and insufficient participation of students. Over the years, researchers have commented on the 'accounting student pipeline', the weak current state of accounting education, plus perceptions that accounting is a difficult subject. Furthermore, researchers have documented that whilst some universities made progress in the 1990s and 2000s, accounting education has remained unchanged for more than 50 years despite the persistent 'crisis in accounting education'. Hence the pressing need for accounting educators to address the above challenges. Utilizing AI teaching tools and making accounting education more engaging and relevant will contribute towards its improved understanding of accounting. Instructors need to increase the students' involvement, enhance the impact of learning, and encourage the quality training of financial accounting talents. These can be achieved through interactive AI teaching tools.

Research utilizing age-appropriate pedagogies have found that AI literacy development may provide a more holistic learning environment at higher education levels. AI learning objectives address three dimensions: a) learning framework synthesizing understanding of concepts, processes, principles, and applications, and b) social and emotional framework integrating motivation and attitudes towards learning. The use of AI teaching tools in accounting teaching at higher tertiary levels not only optimizes teaching methods but also improves classroom design, enhances student-teacher interaction, and provides data for teachers to study the understanding of students. Furthermore, AI, when used in teaching, can improve the quality and efficiency of financial management professional talents cultivation, reduce the human management cost, and provide students with the knowledge to adapt to the current economic situation.

Studies demonstrate that students with higher conscientiousness (e.g., self-discipline) and Grit (particularly Perseverance of Effort) engage more deeply with AI tools, leading to greater academic gains. These traits predict consistent tool usage, which in turn improves performance in structured tasks like accounting. Additionally, emotionality may reduce

engagement, as highly anxious students tend to avoid AI interfaces. Importantly, sex and educational background play roles, with females and students in quantitative fields (e.g., Finance) benefiting disproportionately. These findings suggest that AI tools do not operate uniformly; instead, their impact cascades through a network of individual differences, where personality and cognitive strengths shape the trajectory of learning success. Future designs should personalize AI interactions based on these learning profiles to maximize efficacy.

The research findings reported constitute an original contribution to this direction. More specifically in studying 104 undergraduate accounting students who utilized AI teaching tools it was found that (a) those students who used the AI teaching tools performed better in Financial Accounting rather than Management Accounting; (b) there was no significant finding relating to their gender or if they were repeating students; (c) AI teaching tools benefited the students with high Grit, specifically high perseverance of effort, more than those with low Grit; and (d) a student's entrance course to the university correlated significantly with their AI teaching tools, usage, which in turn was associated with their final mark.

In conclusion, AI teaching tools were found to be associated with higher marks in Financial Accounting rather than Management Accounting, whilst also helping students with high Grit to perform better in studying and achieve higher marks. Finally, better students when using AI teaching tools outperformed weaker students. Thus, AI teaching tools can be beneficial in improving students' performance in accounting courses. Our findings contribute to the flourishing literature of AI integration in educational settings.

Duyen Le
Research Associate, Green Project Management (GPM), USA
&
Michael Pace
PhD Candidate, University of Glasgow, UK

A New Framework for Transformative Learning in Project Management Education

Traditional models of higher education, particularly in professional fields, are inadequately preparing graduates for the complex, systemic challenges of the 21st century, such as climate change and social inequality. This paper addresses this critical educational gap through a case study in project management, introducing the Capabilities Approach to Regenerative Education for Project Management (CARE for PM), a new theoretical framework for curriculum and pedagogical design. Drawing on the Capabilities Approach pioneered by Amartya Sen and Martha Nussbaum, we argue for a fundamental shift in educational goals—from the mere acquisition of technical competencies to the cultivation of students' capabilities, defined as their real freedoms to achieve valued ways of being and doing. Through a synthesis of educational philosophy, a critique of established assessment models like Bloom's Taxonomy, and an analysis of professional certifications, we construct the CARE for PM framework. Our findings suggest that a capabilities-oriented curriculum cultivates not only technical proficiency but also the essential transdisciplinary competencies of systems thinking, ethical reasoning, and collaborative leadership—all of which are cornerstones of transformative and regenerative practice. The paper concludes with actionable recommendations for curriculum design, institutional implementation, and assessment, offering a robust model for other professional disciplines seeking to foster a more just, effective, and transformative approach to education.

Nick Linardopoulos
Associate Teaching Professor, Rutgers University, USA

AI, Communication and the Future of Teaching & Learning

This presentation will analyze the different ways and through artificial intelligence (AI) technologies were purposefully taught and incorporated in a large lecture introductory communication course. Using the AI Assessment Scale model (AIAS), the course assignments and associated content modules were modified to reflect the strategic and ethical use of AI as a key component of effective communication skills with a direct connection to the course learning outcomes. Accordingly, the presentation will provide a comparison of the assignments and content before and the incorporation of the AIAS, assess the impact of the AI aspect in the course learning outcomes and student perceptions and provide recommendations for the broader implications for teaching and learning when using AI activities as part of the course curriculum.

Robert Mejias
Professor and Director, Center for Cyber Security Education and Research, Colorado State University-Pueblo, USA
Morgan Shepherd
Professor, University of Colorado-Colorado Springs, USA
&
Raul Y. Reyes
Professor, University of Arizona, USA

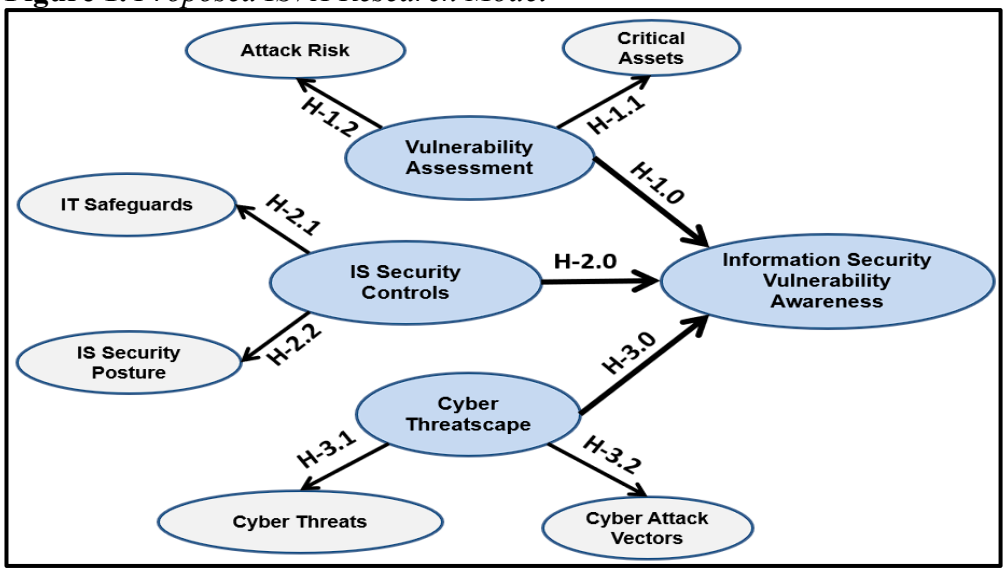
Possible Determinants of Information Security Vulnerability Awareness (ISVA)

The proliferation of new and emerging technologies, particularly driven by artificial intelligence, has rendered information systems increasingly complex, thereby presenting challenging cyber threats and system vulnerabilities that require urgent attention. Additionally, most IS architectures may not be agile enough to quickly assess or mitigate these cyberattacks vulnerabilities, hindering the use of appropriate IT safeguards in a cyber-safe manner.

Our research proposes a multi-criteria model in analyzing possible factors that influence information security vulnerabilities awareness (ISVA). Drawing from prior cybersecurity and vulnerability assessment research, this empirical field study develops a research model to analyze possible determinants influencing information security vulnerability awareness. Three constructs were analyzed to explore their association to ISVA: *vulnerability assessment, assessment of IS security controls*, and *knowledge of an organization's cyber threatscape*. The data analyzed was obtained via a survey questionnaire instrument. Confirmatory factor analysis and structural equation modeling were used to validate the proposed research model (see proposed research model in Figure 1).

The results of our proposed research model indicate significant correlations between these three second-order variables and ISVA. *Vulnerability assessment*, and *knowledge of an organization's cyber threatscape* generating the highest correlations with ISVA while *IS security controls*, generated lower correlations with ISVA. This research proposes that organizations may increase their awareness of information security vulnerability by better assessing their IS security vulnerability, their organization's IS security safeguards, and expanding knowledge of their organization's cyber threatscape.

Figure 1. *Proposed ISVA Research Model*



Adam Nir
Professor, The Hebrew University of Jerusalem, Israel

The Subordination of Public Schools to Dual Hierarchies: Challenges and Opportunities

Most organizational systems operate under a single chain of command, typically overseen by a manager or executive board responsible for setting priorities, assigning tasks, and establishing work procedures. However, some organizations operate within dual hierarchical structures, wherein a manager is simultaneously accountable to two distinct authorities. Such conditions complicate decision-making processes and may undermine organizational coherence. While most research on dual hierarchies has predominantly focused on profit-driven enterprises or service-oriented institutions with internally structured dual hierarchies, empirical evidence addressing domesticated organizations governed by two external hierarchies such as public schools, remains limited. This study seeks to investigate the unique challenges faced by school leaders operating within a dual governance framework. It examines the tensions and opportunities arising from the subordination of public schools to two external authorities and analyses the coping strategies employed by school leaders to manage conflicts and improve resource allocation to their school.

Data were collected through semi-structured interviews conducted with seven school principals, three Heads of Local Education Authority (LEA) education departments and three Ministry of Education (MOE) superintendents.

Consistent with prior research, the interviewees identified several disadvantages associated with subordination to dual hierarchies. These include **increased workload and time constraints,** a heightened bureaucratic burden and overlapping responsibilities, the need to navigate political rather than professional considerations and the challenge of reconciling external perceptions and values that may conflict with their own. Nevertheless, they also mentioned several advantages of this dual subordination. In particular, they highlighted the richness of services offered by both the MOE and the LEA as well as the comprehensiveness and alignment of these services with the specific needs of their schools.

The analysis also revealed three strategies employed by school principals to navigate the complexities of dual subordination to both the MOE and the LEA. These strategies include collaborative communication, acting as intermediaries to enhance coordination between the two bodies and bypassing officials between the two bodies the MOE and at the LEA.

The implications of public schools' subordination to dual hierarchies are further discussed.

Gulnur Ozbek
Postdoctoral Research Associate, St. John's University, USA
John Spiridakis
Professor, St. John's University, USA
&
Seokhee Cho
Professor, St. John's University, USA

Longitudinal Engagement and Impact of the Advanced Dual-Certificate Professional Development Project LEADER

This longitudinal study examines the engagement and impact of a two-year Advanced Dual-Certificate Professional Development Project LEADER designed to prepare education leaders working with ELs. This study describes a two-year Advanced Dual-certificate Professional Development Project LEADER program designed for educators working with ELs. The LEADER program is designed to prepare diverse school leaders through two advanced certificate graduate programs in School Building Leadership (SBL) and either Bilingual Education (BE) or TESOL, with integrated components in Peer-Assisted Learning Strategies (PALS) and Family Engagement & Literacy (FEL). This approach is informed by diagnostic needs assessment procedures and grounded in research on effective school leadership in bilingual and TESOL contexts. Using quantitative and qualitative data collected throughout the program, this study examines educators' professional growth trajectory, perceived impact, and self-reported practices.

Research questions:

(RQ1) What are educators' perceived impact of the two-year Advanced Dual-Certificate Professional Development Project LEADER program across pre- and three (3) post-tests in SBL, BE/TESOL, PALS, and FEL trajectories?
(RQ2) How do educators describe their perceptions and self-reported practices preparing diverse school leaders working with ELs as they engage in the LEADER program?

This longitudinal study employed a mixed-methods approach and a crossover design to examine the program's impact. Pre- and three post-tests were administered to assess professional growth trajectories. The study utilized criterion-based purposeful sampling, as participants were selected through a three-step process: an interest form, information sessions, and interviews, with random assignment applied within the purposively selected sample. Of 210 candidates, 40 teachers were selected

from five counties, ten high-need school districts, and classrooms with high percentages of ELs. Data were collected by administering pre- and three post-test surveys with five components: SBL, BE/TESOL, FE, PALS, and PD. Each term, participants reflected on their perceptions related to five components. Project mentors conducted classroom observations three times for each scholar, evaluated performances, provided feedback, and interviewed them on implementation fidelity

The LEADER program demonstrated significant positive impacts on preparing leaders for diverse schools to meet the needs of ELs. Through a comprehensive two-year-long two advanced certificate graduate programs with integrated components, educators enhanced their leadership skills, instructional practices, and ability to engage families effectively. This study's longitudinal approach and mixed-methods evaluation revealed growth across all components, emphasizing the value of structured, sustained professional development for promoting equity and achievement in diverse educational settings.

Henri Pesonen
Professor, University of Oslo, Norway

Early Childhood Education and Care Professionals' Descriptions of Challenging Situations in Norwegian Kindergartens: A Qualitative Pilot Study

Early childhood education and care (ECEC) is encountering considerable challenges not only across Europe, but also within the Nordic region, and especially in Norway. ECEC professionals in Norway (teachers, special teachers, pedagogical leaders, assistants, kindergarten managers, child and youth workers) are currently working in challenging situations in which they feel helpless in ensuring appropriate pedagogy and effective early support for every child. Despite the recognition of challenging situations and public discourses surrounding them, we know too little about what leads to them in professionals' daily work and how the institutional structures might appear around such situations.

The purpose of this pilot study was to explore ECEC professionals' descriptions of challenging situations and to generate ideas for future qualitative research on this topic. The data consisted of 251 written descriptions from kindergarten professionals of the challenges they face in ECEC in Norway, with an average length of 40 words, collected as part of a survey. The survey contained one open-ended question in the beginning that is used in this pilot study, followed by a quantitative section about work wellbeing. The open-ended question instructed participants to "Describe a situation from kindergarten that you find challenging, where it seems as if you have no more solutions".

Qualitative content analysis identified three main themes with nine subthemes related to factors contributing to challenging situations in ECEC in Norway. The main theme of Excessive sickness absences consisted of recruitment difficulties of competent staff, shortage of resources, and seeing children as demanding. The second main theme of High job demands comprised expectations to ensure support for all children, time constraints for pedagogical work, and limited planning time. Limited collaboration emerged as a third main theme that included unsupportive structures, uncooperative colleagues, and inadequate communication with families.

Results suggest that the factors related to challenging situations could be studied through theories on belonging, particularly focusing on barriers to professionals' belonging. ECEC educators' own belonging is an important foundation for professional growth including job

satisfaction, stress reduction, collaboration, staff retention, positive culture and building inclusive ECEC communities with positive child impact. Yet the current findings do not appear to reveal novel aspects related belonging. Thus, this pilot study indicates that future studies should, for example, draw on analytical concepts that deepen understanding of the mechanisms and conditions that contribute to challenging situations and to professionals' belonging. For example, analytical concepts from discursive analysis approaches can have potential to advance the theoretical development of belonging dimensions related to professionals' work in ECEC context. Future studies should also employ various methods of qualitative data production and not only focus on using prompts that generate challenges related to work in ECEC, as well as use participatory research approaches. Furthermore, this pilot study suggests that focusing specifically on ECEC teachers, who often hold the main pedagogical responsibility in ECEC, and using new methodological approaches has the potential to provide insights into their belonging and collaboration with colleagues and other multi-agency collaborators.

Florian Pramme
PhD Student, Ostfalia University of Applied Sciences, Germany
&
Tamás Kurczveil
Professor, Ostfalia University of Applied Sciences, Germany

A 5G Campus Network Architecture Enabling Cooperative V2X Communication for Autonomous Driving

This paper presents an integrative approach for developing and evaluating Vehicle-to-Everything (V2X) communication architectures supporting autonomous driving in 5G campus networks. The work focuses on Cellular V2X (C-V2X) Day-2-Use-Cases and investigates how 5G standalone (SA) networks can enhance communication performance in safety-critical scenarios. Key aspects include ultra-low latency, high reliability, and real-time data processing through Mobile Edge Computing (MEC) and network slicing.

A dedicated 5G campus network is being deployed at Ostfalia University of Applied Sciences in Wolfenbüttel, Germany. Within this environment, Road Side Units (RSUs) equipped with radar, LiDAR, and camera sensors provide collective perception by sharing sensor data with connected autonomous vehicles via Collective Perception Messages (CPMs). This setup enables cooperative perception and decision-making across vehicles and infrastructure.

An autonomous shuttle service operating on a defined campus route serves as a demonstrator platform. The system integrates conventional onboard sensors with V2X communication to evaluate the benefits of 5G-enabled coordination in complex urban scenarios, including low-visibility intersections and unexpected obstacles. Experimental investigations focus on four main research questions: (1) communication performance improvement using 5G-SA and slicing compared to existing technologies, (2) effectiveness of V2X Day-2-Use-Cases in intersection management, (3) real-world latency behavior of Ultra-Reliable Low-Latency Communication (URLLC), and (4) MEC contributions to real-time decision support and traffic safety.

Preliminary results are expected to demonstrate that 5G-based V2X significantly enhances reliability and responsiveness in autonomous driving tasks. The findings will contribute to defining architectural design guidelines for future cooperative intelligent transport systems (C-ITS) and highlight the role of 5G networks as an enabling technology for connected and automated mobility within smart city infrastructures.

Yvonne Pratt-Johnson
Professor, St. John's University, USA

The Impact of Globalization on the Professional Competence of Educators and Educational Leaders

Globalization continues to redefine education at every level—from K–12 classrooms to higher education institutions. The rapid exchange of knowledge, advances in technology, and increased cultural interconnectedness are transforming the competencies required of teachers and educational leaders. This presentation examines how globalization shapes professional competence across both K–12 and higher education contexts, highlighting the shared challenges and opportunities educators face as they prepare learners for a global society.

Professional competence in the global era extends beyond content expertise and pedagogy. It includes intercultural understanding, digital literacy, ethical leadership, and the capacity to adapt to complex social and technological change. For K–12 teachers, this means creating inclusive classrooms that integrate global perspectives and cultivate students' curiosity about the wider world. For higher education faculty and administrators, it involves designing programs that prepare future educators and leaders to think critically, act responsibly, and collaborate across cultures and disciplines.

Drawing on current research and practice-based examples, this presentation identifies key dimensions of global professional competence—cultural responsiveness, technological fluency, reflective practice, and global awareness. It also addresses systemic challenges, such as inequities in access to resources and professional learning, and the tension between local educational goals and global standards. The discussion emphasizes strategies for developing global competence through continuous professional learning, mentorship, and cross-institutional collaboration. Case studies from both school and university settings will illustrate how educators can integrate global learning into curricula, leadership development, and institutional culture.

Ultimately, this presentation argues that globalization, while challenging traditional educational models, also creates opportunities for innovation and renewal. By embracing global competence as an essential component of professional identity, teachers and educational leaders at all levels can more effectively prepare students to engage

thoughtfully, ethically, and productively in a diverse and rapidly changing world.

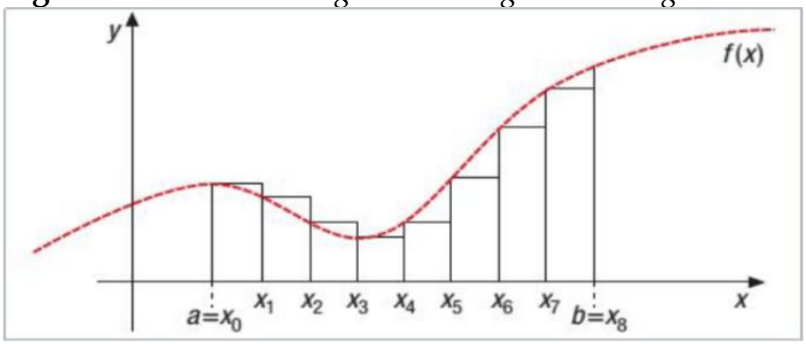
Mauro Pullin
Adjunct Professor, University of Padova, Italy

Approximate Rectangular and Trapezoidal Integration, with Implementation in the Java and Python Programming Languages

This work describes how to calculate the definite integral of a function, which cannot be integrated analytically, using the rectangle method and the trapezoidal method, with implementation in Java and Python programming languages.

In the rectangle method, the region to be integrated is divided into n rectangular parts all having the same width h=(b–a)/n, where h is called the integration step.

Figure 1. *Numerical Integration Using the Rectangle Method*

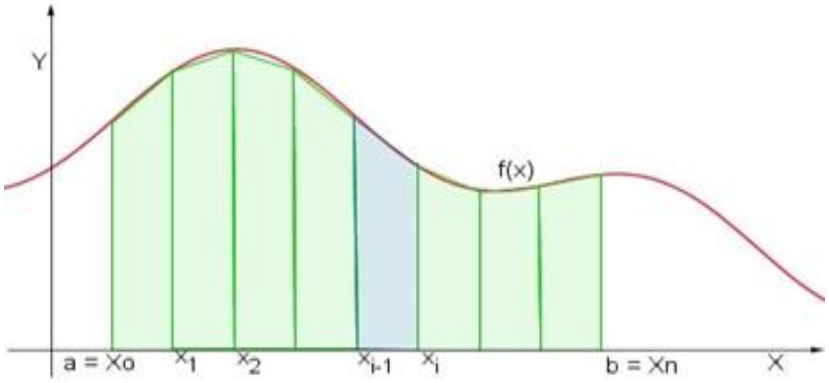


Unless there is an error, the sum of the areas of the rectangles equals the area under the curve with the equation y=f(x). It is intuitively understood that the error decreases as the number n of intervals increases.

In the trapezoidal method, the interval of integration [a,b] is divided into n equal parts, and the area of the trapezoids with height h=(b–a)/n and bases given by the value of f(x) at the ends of each subinterval is calculated.

In the trapezoidal method, the interval of integration [a,b] is divided into n equal parts, and the area of the trapezoids with height h=(b–a)/n and bases given by the value of f(x) at the ends of each subinterval is calculated.

Figure 2. *Numerical Integration Using the Trapezoidal Method*



The computer implementation was carried out in the Java and Python programming languages, because they are very powerful and versatile.

Jose Roberto Serra Martins
Professor, Federal Institute of São Paulo, Brazil

Teaching Training for Science Teachers: From Self-Formation to the Operationalization of Projects

Recently, teachers from various fields have become increasingly interested in continuing education courses, both to develop skills and abilities and to build knowledge about new teaching approaches. Within these perspectives, I chose emerging contaminants and green chemistry as motivation for developing contextualized teaching materials, inspired by transdisciplinary approaches and guided by the logic of human development, for a continuing education course for science teachers, as I stated in my doctoral dissertation. In the first phase of the research, the course was structured, and the instructional materials, targeted at educators and discussed with advisors, were written. In the second phase, the transdisciplinary approach was contextualized and presented to the educators attending the training course, recording their narratives about the teaching materials and their problematizations. In the third phase, the teachers proposed thematic activities to their students and collected data to develop, in the fourth and final phase, an analysis of the thematic activities, particularly the results of the mediated discussions and the proposed interventions at the school (or community) level through work projects. I developed the research methodology based on two research scenarios: in the first—during the training course—I explored the three phases of transdisciplinary self-training with the teachers, problematizing their positions regarding hetero-training, eco-training, and self-training, collecting data in a field notebook; in the second scenario, I analyzed the teachers' narratives and positions, based on the analyses and results obtained from the thematic activities and work projects, facilitated by the teachers and developed by their students, which are part of the final course assignments. The analysis and discussion of the data obtained in the four phases demonstrated that, although the strategies used by the teachers were similar, the results were quite different, revealing that the teachers who used the transdisciplinary approach were able to construct, together with their students, concepts more consistent with complex thinking. Thus, it is possible to affirm that: (1) from a pedagogical perspective, most students were successful, albeit partially, in constructing (or reconstructing) concepts related to thematic activities; (2) from the perspective of self-education, the most significant results were achieved by students who positively contributed to the process, associated with teachers who

focused on mediating the teaching/learning process rather than guiding it; (3) in the social sphere, work projects were developed that will potentially bring benefits to society as a whole. In conclusion, there appears to be a direct relationship between the results obtained by students, the self-education process, and the use of the transdisciplinary approach by educators, notably aiding in the development of complex thinking and the reconnection of knowledge.

Alina Romanovska
Associate Professor, Daugavpils University, Latvia
&
Dzintra Ilisko
Professor, Daugavpils University, Latvia

Non-Formal Education for Social Cohesion: A Theory of Change Approach to Museopedagogical Practice

In culturally diverse societies, fostering social cohesion among young people remains a pressing challenge, particularly in contexts marked by historical fragmentation and limited intergroup dialogue. This paper explores the potential of non-formal education to address these challenges through creative, participatory practices situated in cultural institutions. Focusing on Daugavpils (the second-largest city in Latvia and a historically multicultural space), this study examines how museopedagogical activities can strengthen intergroup dialogue.

The paper is based on the case study *"The Other in Art and Life,"* a series of youth workshops developed and implemented by the Mark Rothko Museum in collaboration with Daugavpils University within the framework of "*The Horizon Europe*" programme project "*The Cultural Literacies' Value in Europe*" (CLiViE) (grant agreement No. 101132285). The workshops engaged young participants from diverse cultural, linguistic, and social backgrounds in collective artistic practices and critical reflection on themes of identity, difference, and coexistence. Positioned within the framework of non-formal education, the initiative created a dialogical space where participants could encounter "the other" as an opportunity for shared meaning-making.

To develop the workshops, the study employs the Theory of Change framework. This approach enables a systematic understanding of how creative practices, guided reflection, and facilitated interaction can foster cultural literacy, empathy, and communication across differences.

The findings suggest that museopedagogical practice, when grounded in participatory and reflective methods, can contribute to collaboration among diverse groups. The workshops supported the development of participants' critical engagement with art, while also enhancing their capacity for dialogue and mutual understanding. In this way, non-formal education within a museum context emerges as a significant platform for promoting social cohesion at the local level.

By linking theoretical perspectives on cultural commons and social cohesion with practice-based insights from non-formal education, this paper contributes to ongoing discussions on the role of cultural

institutions in addressing societal fragmentation. It argues for the importance of integrating creative, youth-centered approaches into broader strategies for inclusive community development.

Astrid Schmied
Education Research Scientist, National Institute of Education, Nanyang Technological University, Singapore

Adapting Critical Appraisal Tools for Context-Sensitive Systematic Meta-Reviews in School-Based Mathematics-Related Education

Mathematics-related education in school-age populations must be supported by high-quality evidence to ensure effective and equitable instructional practices. While previous reviews have examined the impact of mathematics interventions, less attention has been given to the methodological rigor of the evidence synthesis process. In particular, there is a need to explore how appraisal frameworks are adapted and applied to enhance the credibility and relevance of findings in this field.

The primary focus of this study was the adaptation and application of Critical Appraisal Tools for Systematic Reviews and Research Syntheses to evaluate the quality of included reviews on mathematics-related education. A systematic search across eight databases spanning neuroscience, educational psychology, and artificial intelligence identified 100 peer-reviewed studies focused on school-age learners. The checklist was adapted in line with a systematic meta-review protocol to ensure alignment with the aims and structure of this synthesis. For example, within the PICO framework (Population, Intervention, Comparator, Outcome), the Comparator component was omitted because many included studies lacked explicit comparison groups. Additionally, the response options, such as "unclear" and "not applicable," were refined and customized to better reflect the context and reporting characteristics of the included studies. Further adjustments were made to enhance the assessment of methodological transparency, reporting consistency, and applicability to school-based mathematics education.

Each study was appraised using the adapted checklist, enabling a structured evaluation of trustworthiness, relevance, and reported outcomes. The appraisal process revealed variability in methodological quality and highlighted the importance of context-sensitive adaptations when applying appraisal tools in systematic meta-reviews.

This study demonstrates how Critical Appraisal Tools can be effectively adapted for use in systematic meta-reviews, contributing to more rigorous and transparent evidence synthesis and strengthening the evidence base for mathematics-related education in school settings.

Fathi Shamma
Lecturer, The Open University of Israel, Israel
Tali Heiman
Professor, The Open University of Israel, Israel
&
Dorit Olenik-Shemesh
Professor, The Open University of Israel, Israel

The Mediating Roles of Religiosity and Social Cohesion in the Relationship between Volunteering and Psychological Resilience among Arab Adolescents in Israel

Despite growing interest in volunteering's impact on psychological resilience, empirical research remains limited regarding the interplay of volunteering, religiosity, and social cohesion among minority adolescents in multicultural societies. This study examines dynamic relationships among volunteering, religiosity, social cohesion, and psychological resilience among Arab adolescents in Israel.

The study surveyed 520 Arab adolescents, using five validated instruments. a demographic questionnaire, the Youth Volunteering Questionnaire (Szold Institute, 2018), the Religious Level Questionnaire (Van Tienen et al., 2011), combined items from the Connor-Davidson Resilience Scale and Brief Resilience Scale, and a researcher-developed Social Cohesion Questionnaire Results revealed significant positive correlations between volunteering and psychological resilience, and between religiosity and psychological resilience.

Multiple regression analyses indicated that both religiosity and social cohesion partially mediate the volunteering-resilience relationship, with social cohesion emerging as the stronger mediator (27% of the effect, compared to 18% for religiosity).

Findings suggest volunteering contributes to psychological resilience development through multiple pathways, including direct effects and indirect effects mediated by religiosity and social cohesion The study bridges an important gap in understanding how cultural, religious, and social factors interact to influence resilience development in minority adolescents.

Terry Stockton
Assistant Professor, Grand Valley State University, USA
&
Sarah Chase
Faculty, Grand Valley State University, USA

Teacher Preparation Professional Dispositions: Global Implications for Reinforcing Ethical Responsibilities

The global rise of fascism and authoritarianism has reshaped educational priorities and narratives, influencing both national policy and international discourse on teacher education. In many countries, including the United States, exclusionary ideologies and anti-diversity, equity, and inclusion (DEI) policies threaten to erode the ethical and equity-based commitments that underpin professional teaching dispositions (PTDs). These developments emphasize the urgent need to prepare future educators who can meet the profession's ethical responsibilities within diverse, global contexts.

Our work, situated at a large Midwestern U.S. university, builds on an international foundation of PTD scholarship that consistently affirms the importance of equity, critical consciousness, and inclusive practice. While professional standards across nations frequently highlight values such as commitment to student learning, professional growth, and ethical conduct, our critical analysis of PTD scholarship from 2014–2024 revealed an increased emphasis on sociopolitical literacy, anti-bias pedagogy, and asset-based practices—particularly in response to political misinformation and polarization, the COVID-19 pandemic, and the global resurgence of far-right extremism.

We employed an integrated qualitative approach combining critical thematic analysis (Braun & Clarke, 2006, 2021), critical discourse analysis (Fairclough, 2013; Gee, 2014), and self-study (Pinnegar & Hamilton, 2009; Bullock & Ritter, 2011) to examine: (1) Trump-era executive orders related to DEI, (2) contemporary PTD scholarship, (3) accreditation standards, and (4) our own reflective narratives as faculty.

Analysis of Trump-era executive orders and accreditation standards exposed tensions between stated commitments to diversity and policy constraints, underscoring that PTDs are inherently political. Our findings also show that while traditional PTD frameworks emphasize general professionalism, explicitly embedding political and equity-oriented dispositions across teacher preparation curriculum is needed in response to the current political landscape. With these factors in mind, we explored how our three-course Educational Foundations sequence,

EDF 115 (identity), EDF 315 (systems), and EDF 495 (action research), scaffolds the development of ethical, reflexive teachers prepared to engage critically with systems of power. Therefore, we analyzed ways to improve upon fostering healthy professional habits, reflexivity, critical consciousness, DEI advocacy, and asset-based practice, which are reinforced across courses and sustained into professional contexts. The collaborative literature review process itself became a site of professional learning, mirroring these reflective and critical habits we seek to cultivate in our students.

The outcomes of this work are both immediate and far-reaching. In the short term, we have designed a scaffolded curricular framework that deliberately links identity formation, systemic analysis, and action research to the development of professional dispositions. Over the long term, we urge teacher preparation programs worldwide to actively resist harmful policy shifts, safeguard and expand equity-centered PTDs, and ensure that future educators are equipped and held accountable for engaging in justice-oriented practice within a global educational landscape. Our three-course sequence offers a replicable model for embedding dispositions across the curriculum, reinforcing the ethical obligations of the profession and fortifying them against political and ideological erosion.

Iyad Suleiman
Lecturer, Tel Hai University, Kiryat Shmona, Israel

Potential Outcomes of Subsidized Medical Care: Evaluating Premature Birth Odds Ratios

The main goal of this work is to conduct a potential outcome analysis and calculate Odds Ratio estimators, involving T as a binary indicator of a pre-existing environmental condition of the mother- having or not having a private medical care. Although it may be hard to consider T as a trivial treatment (i.e., "prescribing a drug") and usually is an outcome of income level and age, I believe that due to the high detail of covariates in the dataset it is possible to isolate its effect. Meaning, ignorability can hold -while conditioning on x, the joint distribution of (Yo, Y1) is independent of T. In other words, I believe that there are generally no unmeasured confounders.

Sandra Styres
Associate Professor, Ontario Institute for Studies in Education,
University of Toronto, Canada

Radical Imagining Indigenous Education: Centering Land-based Practices in Transformative Education

It is well documented that many Indigenous students remain underserved by mainstream models of education and continue to struggle in K-12 classrooms. This paper draws upon the author's work and the ways lifelong and holistic learning manifests within Indigenous educational paradigms. The author also discusses radical imagining Indigenous education and the ways trauma informed dignity driven practices informs her work as a scholar with Indigenous ancestry. Further, in this paper the author explores the concept of circularity as a foundational worldview that reflects the interconnected, relational, and resilient nature of Indigenous ways of knowing. She also considers circularity and the development of the 8 R's as an anti-colonial/de-colonial framework that disrupts and resists colonial educational narratives within mainstream learning contexts. She then offers some insights in visioning forward in order to discuss where this work can be expanded. Additionally, this paper serves to deepen and expand the ethical and transformative dimensions of Indigenous education. The overall goal of this paper is to radically re-imagine Indigenous education to build educational systems that honour Indigenous brilliance, uphold Indigenous sovereignty, and create spaces where all learners, and especially Indigenous students, can thrive.

Makoto Tatsuta
Professor, National Institute of Informatics, Japan

Normal Cyclic Proof Theorem

Inductive definitions are important in computer science as well as mathematical logic. In computer science, inductive definitions can define useful recursive data structures such as lists and trees. In mathematical logic, Inductive definitions may also increase the proof theoretic strength for given logical systems. An inductive definition is a way to define a predicate by an expression which may contain the predicate itself. The predicate is interpreted by the least fixed point of the defining equation. Martin-Lof's system of inductive definitions given in Martin-Lof (1971) is one of the most popular systems of inductive definitions.

Recently, Brotherston and Simpson proposed a cyclic proof system (Brotherston & Simpson 2011), which is an alternative formalization of inductive definitions. They investigated Martin-Lof's system LKID of inductive definitions in classical logic for the first-order language, and the cyclic proof system CLKIDomega for the same language, showed the provability of CLKIDomega includes that of LKID, and conjectured the equivalence. This conjecture was partially solved by Berardi & Tatsuta (2017) by showing that if both system have Peano arithmetic, the provabilities of CLKIDomega and LKID are equivalent.

In this paper, for the system CLKIDomega, we define a normal cyclic proof as a cyclic proof that satisfies (1) each bud has companion in the same path, and (2) for each bud, there is some number q such that there is a progressing trace from the q-th inductive atomic formula in its companion to the q-th inductive atomic formula in the bud. Then we prove that for a given cyclic proof, there is a normal cyclic proof with the same conclusion.

In Oda et al. (2023), they proved that for a given cyclic proof, there is a normal cyclic proof with the same conclusion, where that paper defined a normal cyclic proof as a cyclic proof that satisfies only the condition (1) each bud has companion in the same path.

Our new theorem is stronger than that in Oda et al. (2023), since our theorem shows that we can find the position q that is increased by a progressing trace. Our result would be the first step to establish new proof transformation from a cyclic proof into a Martin-Lof's inductive proof, which will be more efficient proof transformation than that given in Berardi & Tatsuta (2017).

Daniel Thomas III
Assistant Professor, Texas A&M University, USA
&
Langston Clark
Interim Department Chair, Department of Interdisciplinary Learning and Teaching & Professor, University of Texas at San Antonio, USA

Curriculum-Making in Black Hands: Humanities Education in Black-Led Schools

As debates over history, literature, and ethnic studies intensify in the United States, Black teachers increasingly face institutional barriers to teaching the humanities in meaningful and culturally sustaining ways. While prior research has focused largely on public and charter schools, far less is known about how Black educators work within Black-led independent schools—institutions historically rooted in self-determination and community autonomy.

This presentation draws on a Spencer Foundation–funded qualitative multi-case study of two contemporary Black-led independent schools to examine how Black humanities teachers design, interpret, and enact curriculum amid ongoing attacks on Black knowledge. Data sources include classroom observations, semi-structured interviews with teachers, families, and board members, instructional artifacts, and student focus groups using photo-elicitation methods.

Preliminary findings suggest that Black teachers in these settings experience greater pedagogical freedom to center Black history, civic engagement, and cultural critique, while aligning instruction with community-defined educational aims. These teachers function not merely as implementers of curriculum, but as intellectual stewards shaping how Black youth understand race, citizenship, and belonging.

By centering teachers' practices within autonomous Black institutions, this study contributes to international conversations on educational sovereignty, culturally relevant pedagogy, and the protection of the humanities in politically contested contexts.

Molly Tovar
Educational Consultant, Trail Tree Consulting, USA
&
Kellie Thompson
Educational Consultant, Trail Tree Consulting, USA

The Importance of Training Teachers on Indigenous STEM Concepts in K-12 Education

The underrepresentation of Indigenous students in Science, Technology, Engineering, and Mathematics (STEM) fields, coupled with the achievement gaps they experience, presents a significant challenge for the educational system. Research consistently shows that Indigenous students score lower on standardized STEM assessments, highlighting the need for more culturally responsive and inclusive teaching methods. This study explores the importance of training K-12 educators to integrate Indigenous STEM concepts into the curriculum, with the aim of improving academic outcomes for Indigenous students, enriching STEM education for all students, and promoting broader societal benefits. The study focused on the effectiveness of professional development workshops designed to incorporate Indigenous perspectives into K-12 STEM education. Pre- and post-training surveys, follow up surveys, and Likert scales were used to assess changes in participants' knowledge of Indigenous concepts and their intentions to incorporate these ideas into their curricula. Results and key findings indicated a significant increase in participants' understanding of Indigenous knowledge, with many expressing a commitment to regularly integrating these perspectives into their lessons. Teachers also reported greater confidence in using culturally relevant content to improve student learning outcomes. This research underscores the positive impact of professional development in fostering the inclusion of Indigenous knowledge in STEM education and highlights the need for ongoing support to overcome curriculum implementation challenges. The study offers valuable insights for educators, administrators, parents, and counselors working to increase Indigenous students' interest in STEM fields and improve their educational experiences. Key recommendations include curriculum development with Indigenous input, teacher professional development, fostering community and tribal partnerships, and providing support for Indigenous students through mentorship and extracurricular programs.

Mark van der Pas
CEO, Uffective, The Netherlands

Enhanced Time Estimation Improvements in Agile Developments: A Seven-Year Natural Experiment

This study presents a seven-year natural experiment investigating time estimation accuracy in agile software development. Building on prior work, we monitored estimation performance before and after targeted feedback interventions, which exposed teams to their historical estimation errors and encouraged calibration. We compared human estimators to two AI models using metrics including Mean Absolute Error (MAE), Mean Squared Error (MSE), Forecast Bias, Percentage Forecast Bias, and Mean Absolute Percentage Error (MAPE). Results show that humans initially exhibit substantial inaccuracy, particularly underestimating larger tasks. However, structured feedback leads to measurable improvements in estimation accuracy and reduced bias over time. The AI models performed competitively, often surpassing humans in MAE and MSE, but were sensitive to changes in context. Our findings demonstrate that while human estimators are prone to error, their accuracy can be improved through feedback, and AI offers a valuable complementary approach for agile teams.

Michele Vaz
Business Manager, McMaster University, Canada
&
Tom Wanyama
Associate Professor, McMaster University, Canada

Expanding Engineering Education through Outreach at the SEPT Learning Factory

This paper presents a case study on the strategic deployment of the W. Booth School of Engineering Practice and Technology (SEPT) Learning Factory at McMaster University as a platform for community engagement, experiential learning, and the cultivation of socially conscious engineers. Traditionally, learning factories are designed as controlled environments where students simulate industrial practices, explore smart manufacturing, and apply Industry 4.0 principles. While these uses remain valuable, they often overlook the potential to connect technical education with pressing societal needs. The SEPT Learning Factory extends the conventional model by embedding outreach-driven product development into both curricular and co-curricular activities. In doing so, it demonstrates that technical training and community engagement can coexist as mutually reinforcing elements of engineering education.

Projects developed within the Learning Factory intentionally address authentic community challenges while building technical competencies. For example, students design and manufacture walking canes, which serve as exercises in user-centered design while also enhancing accessibility for underserved populations. Water filtration systems, created in collaboration with health initiatives in East Africa, provide practical experience in low-resource innovation and technology transfer. Similarly, the design of radio-controlled (RC) cars for high school STEM outreach allows students to apply mechatronics and systems integration while also practicing leadership, mentorship, and science communication. Collectively, these initiatives highlight the versatility of the Learning Factory as a site for both technical mastery and civic engagement.

The model is anchored in experiential, situated, and transformational learning theories. Students learn by doing, reflecting, and iterating; they gain knowledge in authentic contexts shaped by community needs; and they develop broader ethical and professional perspectives as their assumptions about engineering are challenged. The approach fosters social cohesion, motivation, persistence, and deeper

technical learning, while simultaneously strengthening teamwork, communication, problem solving, innovation, and professional identity. In this way, the Learning Factory helps students cultivate both technical expertise and civic responsibility.

This outreach-centered pedagogy also aligns with global imperatives such as the UN Sustainable Development Goals and the competencies demanded by Industry 4.0. Engineers today must design smart, interconnected systems that are not only efficient but also equitable and inclusive. The SEPT Learning Factory prepares students for this hybrid skill set by merging digital fluency with social awareness. Its role in international collaborations—such as the Learning Factories World-Wide (FWW) project under the International Association of Learning Factories—further demonstrates the scalability of this model across diverse contexts, including institutions in the Global South.

In conclusion, the SEPT Learning Factory illustrates how outreach-driven product development can serve as both a pedagogical innovation and a mechanism for social impact. By integrating technical excellence with empathy, ethical reasoning, and interdisciplinary collaboration, the model produces graduates who are not only technically proficient but also deeply aware of the societal contexts in which engineering solutions operate.

Silvana Watson
Professor, Old Dominion University, USA
&
Tara Donahue
Director/Evaluator, Traverse Bay Evaluation, USA

Moving the Needle: Professional Development that Transform Instruction for Multilingual

Although linguistic diversity in U.S. schools is increasing, professional development (PD) for in-service teachers often remains fragmented and disconnected from classroom realities. This presentation explores a PD model designed to effectively improve instructional practices for multilingual learners (MLs). Based on adult learning theory and culturally and linguistically responsive pedagogy, the model combines structured literacy principles, explicit language instruction, and scaffolded academic discourse routines across various content areas. Using a mixed-methods approach, we examined the impact of a year-long PD initiative implemented across elementary settings. The PD included interactive workshops, collaborative planning, and other activities, such as student case studies, for over 80 in-service educators. Quantitative data included pre- and post-measures of teacher instructional knowledge and practices. Qualitative data were gathered from focus groups, reflective artifacts, and project assessments. Results indicate statistically significant improvements in teachers' use of evidence-based practices to teach MLs. The presentation will detail the key design elements that "moved the needle," including coherence across initiatives, distributed leadership structures, protected time for collaborative planning, and ongoing support. Participants will leave with a research-based, scalable framework for designing PD that fosters teacher practices beyond surface-level strategies toward lasting instructional change for multilingual learners.

Jianhua Yang
Professor, Columbus State University, USA

Broadening Cybersecurity Awareness for Middle School Girls via Outreach, Cyber-games, and Storytelling

In USA, national economic security is highly dependent upon a strong cybersecurity workforce. Almost all aspects of the infrastructure depend upon the operation of computers and networks. The security of these systems is imperative to the health and protection of our national infrastructure and information assets. Protecting data and information on computing systems has become even more critical and challenging than ever before. Since the emergence of the Internet and the widespread adoption of web technology, expertise in information assurance has become necessary for many IT professionals. For those working in government agencies, educational organizations, industry, and other businesses, the need for security-skilled workers has doubled from 2021 to 2022.

The United States has experienced a serious shortfall of skilled cybersecurity professionals, especially females. To improve the number of female professionals in cybersecurity, one efficient way to cultivate interest in cybersecurity is when they are younger, such as middle school girls. In this paper, we explore the approaches to broaden cybersecurity awareness among middle school girls by exposing them to cybersecurity topics. Most middle school girls have some computer science (CS) skills, but they need cybersecurity knowledge. We faced the challenge of teaching young students with no CS and little Math background cybersecurity concepts and skills in as little as one week. To engage middle school girls in a one-week cybersecurity schedule, we facilitated a learning-centered classroom and designed a cybersecurity education curriculum via outreach, cyber-game playing, and storytelling. Our methodology for broadening cybersecurity awareness in female students is "learning via seeing, playing, and telling".

Columbus State University (CSU), GA has held the summer camp of "Broadening Cybersecurity Awareness for Middle School Students vis GenCyber Outreach, Games, and Storytelling" four times under the support of the National Security Agency, USA since 2017. The goal of the summer camp was to increase the students' interest in cybersecurity careers and knowledge, fostering their leadership skills as cybersecurity ambassadors. In 2021 and 2023, we only recruited middle school girls as summer campers. By targeting female students, we expect this will ultimately contribute to building a diverse workforce and promoting

appropriate online etiquette amongst the participating middle school students in the community of Columbus, GA, and its vicinity areas of Alabama. The girls participating in the program can apply what they learn from the summer camp in their Internet surfing and continue the camp via Women's Cybersecurity clubs within their schools, as well as influence their peers to pay more attention to cybersecurity awareness. The summer camp is designed in three phases: three-day Pre-camp, five-day summer camp, and one-day post-camp.

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