



THE ATHENS INSTITUTE FOR EDUCATION AND RESEARCH

Abstract Book

**23rd Annual International Conference on
Education
17-20 May 2021, Athens, Greece**

Edited by
Gregory T. Papanikos

2021

Abstracts
23rd Annual International
Conference on Education
17-20 May 2021, Athens,
Greece

Edited by Gregory T. Papanikos

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Preface

This book includes the abstracts of all the papers presented at the *23rd Annual International Conference on Education* (17-20 May 2021), organized by the Athens Institute for Education and Research (ATINER).

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

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

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

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

Gregory T. Papanikos
President

**23rd Annual International Conference on Education, 17-20
May 2021, Athens, Greece**

Organizing & Scientific Committee

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

1. Gregory T. Papanikos, President, ATINER & Honorary Professor, University of Stirling, U.K.
2. David Philip Wick, Director, Arts, Humanities and Education Division, ATINER & Retired Professor of History, Gordon College, USA.
3. John Spiridakis, Co-Editor, Athens Journal of Education & Professor, St. John University, USA.
4. Alexander Makedon, Head, Education Unit, ATINER & Independent Scholar (Retired Full Professor, Chicago State University, USA).
5. Zoi Philippakos, Academic Member, ATINER & Assistant Professor, University of Tennessee, Knoxville, USA.
6. Panagiotis Petratos, Vice-President of Information Communications Technology, ATINER & Fellow, Institution of Engineering and Technology & Professor, Department of Computer Information Systems, California State University, Stanislaus, USA.
7. Pascal Jollivet, Head, Computer Unit, ATINER & Associate Professor, Université de Technologie de Compiègne/Sorbonne Université, France.
8. Denver J. Fowler, Associate Professor of Educational Leadership & Policy Studies, Southern Connecticut State University, USA.
9. Denver J. Fowler, Associate Professor of Educational Leadership & Policy Studies, Southern Connecticut State University, USA.

FINAL CONFERENCE PROGRAM
23rd Annual International Conference on Education, 17-20 May 2021,
Athens, Greece

PROGRAM

Monday 17 May 2021

08.30-09.00
Registration

09.00-09.30

Opening and Welcoming Remarks:

- **Gregory T. Papanikos**, President, ATINER.
 - **Panagiotis Petratos**, Vice-President of Information Communications Technology, ATINER & Fellow, Institution of Engineering and Technology & Professor, Department of Computer Information Systems, California State University, Stanislaus, USA. ([Video](#))
 - **David Philip Wick**, Director, Arts, Humanities and Education Division, ATINER & Retired Professor of History, Gordon College, USA. ([Video](#))
 - **Zoi Philippakos**, Co-Editor, Athens Journal of Education & Assistant Professor, University of Tennessee, Knoxville, USA. ([Video](#))
-

09.30-10:00

Alex MacQuarrie, Senior Lecturer, Griffith University, Australia.

Title: Using a Scholarship to Promote Scholarship: A Unique Approach to Learning and Teaching.

10:00-10:30

Lars Brinck, Head of Research & Associate Professor, Rhythmic Music Conservatory, Denmark.

Title: Promoting Cooperative Creativity Improvisation as Learning in Jazz Settings and the Role of Technology.

10:30-11:00

Orit Broza, Head of Primary School Education Program, Levinsky College of Education, Israel.

Title: Learning by Creation in Scratch in Teacher Training Education Program.

11:00-11:30

Gábor Törley, Senior Lecturer, ELTE Eötvös Loránd University, Hungary.

Péter Bernát, Senior Lecturer, ELTE Eötvös Loránd University, Hungary.

Title: Didactic Connection between Spreadsheet and Programming Teaching.

11:30-12:00

Liat Biberman-Shalev, Head of Education Department, Levinsky College of Education, Israel.

Title: Approaches to Global Education in Teacher Training.

12:00-12:30

Lars Samuelsson, Associate Professor, Umeå University, Sweden.

Niclas Lindstrom, Associate Professor, Umeå University, Sweden.

Title: Online Surveillance and Education for Digital Competence

12:30-13:00

Niclas Lindstrom, Associate Professor, Umeå University, Sweden.

Lars Samuelsson, Associate Professor, Umeå University, Sweden.

Title: Moral Taste and Moral Education – An Interview Study.

13:00-13:30

Manuela Concioiu, PhD Candidate, National University of Political Studies and Public Administration, Romania.

Title: From Teaching about Diversity to Learning on Diversity in the Romanian Educational System.

13:30-14:00

Nerea Gómez Fernández, Researcher, Technical University of Valencia, Spain.

Title: Causal Effects of the Use of ICT on Academic Performance: Evidence from a Census Survey in Madrid.

14:00-14:30 Lunch

14:30-15:00

Carsten Lecon, Professor, Aalen University, Germany.

Title: E-Learning for Media Ethics

15:00-15:30

Thomas Fehlmann, Senior Researcher, Euro Project Office AG, Switzerland. ([Slides](#))

Title: The Fixpoint Combinator in Software Testing – A Step towards Autonomous Testing?

15:30-16:00

Pirkko Kivinen, Senior Lecturer, Tampere University of Applied Sciences, Finland.

Title: Workplace Learning through Digital Work Supervision and Peer Support.

16:00-16:30

Lori Towle, Director, Full Circle Classrooms & Coach, Boston Public Schools, USA.

Title: Case Study of a Constructivist Framework for Professional Learning Communities.

16:30-17:00

Dursun Egriboyun, Lecturer, National Defence University, Turkey.

Title: The Mediation Effect of the Organizational Support and Communication Skills to the Job Satisfaction in the Learning Organizations.

17:00-17:30

Dawn Martelli, Associate Professor, Florida Gulf Coast University, USA.

Title: Writing College Admission Essays: Young Adult Authors Mentor Students from Title I Schools at a University Literacy Festival.

17:30-18:00

Teresa Perkins, Director & Assistant Professor, Doane University, USA.

Title: US Public School Principal Job Satisfaction: A Comparison by Religion and Gender, School Location, School Level.

18:00-18:30

Paulette Hebert, Professor, Oklahoma State University, USA.

Kate Korneva, Graduate Student, Oklahoma State University, USA.

Title: Pivot from an On-Site to Virtual Reaccreditation Visit: One American University's Interior Design Program.

18:30-19:00

Alicia Wenzel, Professor, Western Oregon University, USA.

Katrina Hovey, Assistant Professor, Western Oregon University, USA.

Anne Ittner, Assistant Professor, Western Oregon University, USA

Title: Examining Early Career Teachers' Formative Practices to Inform and Support Continuous Improvement in Educator Preparation Programs.

19:00-19:30

Toyia Curry, Instructional Dean, Arlington Independent School District, USA.

Sharon Waller, Assistant Professor, American University of Ras Al Khaimah, UAE.

Title: Using Formative Assessment to Improve Student Achievement in Reading: Reflections from the Field.

Tuesday 18 May 2021

09:30-10:00

Gabriela Spector-Mersel, Senior Lecturer, The Hebrew University & Sapir College, Israel.

Title: Growth and Pain in Life Story Reflection of Students in Higher Education.

10:00-10:30

Fuad Aleskerov, Professor, HSE University, Russia.

Title: An Evaluation of the Quality of The Enrollment in Russian Higher Education with the Priority Profile Based on Mathematics (2015-2020).

10:30-11:00

Afreen Khan, PhD Student, Aligarh Muslim University, India.

Title: Data Analysis and Ensemble Learning: Correlation COVID-19 Prevalence in India.

11:00-11:30

Abeer Asli-Badarneh, Professor, Bar-Ilan University, Israel.

Title: The Role of Language and Literacy Intervention in Narrative Skills Development in Arabic Speaking Kindergarten Children: A Study of Macrostructure Features and Mental State Terms.

11:30-12:00

Leila Kajee, Professor, University of Johannesburg South Africa.

Salejee Patel, Master Student, University of Johannesburg, South Africa.

Title: Translanguaging: A Step Towards Social Justice Pedagogy in the English Classroom.

12:00-12:30

Jessica Maluch, Assistant Professor, American University in Dubai, UAE.

Title: The Development of Primary Students' L1 Arabic Language and Literacy in English Medium Schools.

12:30-13:00

Serwan Baban, Chief Scientific Advisor, Kurdistan Region Presidency, Iraq.

Title: Private University Governance and Management in Developing Countries.

13:00-13:30

Romalda Kasiliauskiene, Lecturer, Head, Department of Arts and Social Work, Marijampolė College, Lithuania.

Title: Preconditions of Tolerance Development at Higher Educational Institution.

13:30-14:00

Hannele Laaksonen, Principal Lecturer, Tampere University of Applied Sciences, Finland.

Title: The Leadership Competence Produced by a Master's Degree Program at a University of Applied Sciences and the Future Competences Required at Work.

14:00-15:00 Lunch

15:00-15:30

Jerry Medernach, Post-Doc Researcher, German Sport University, Cologne Germany.

Title: Introducing Indoor Bouldering to High School Students: A Self-Reported Perception Analysis of Various Short-Term Training Regimen.

15:30-16:00

Deon Vos, Senior Lecturer, North-West University, South Africa.

Title: The Objectives of the Organization for Economic Co-Operation and Development (OECD) in Correlation with the Objectives of the Brazilian, Russian, Indian and South African Organization (BRICS).

16:00-16:30

Elize Vos, Senior Lecturer, North-West University, South Africa.

Title: Enhancing Adolescents' Self-Directed Reading of Controversial Youth Literature.

16:30-17:00

Susan Penque, Director Graduate Education and Nursing Research, Long Island University-Post, USA.

Title: Lessons from COVID-19: Faculty and Students Experiences during Emergency Remote Education.

17:00-17:30

Rina Bousalis, Assistant Professor, Florida Atlantic University, USA.

Title: The Oral History Project: Discovering the Community's Knowledge, Experience, and Perspective of Events and Issues.

17:30-18:00

Angela Farmer, Assistant Clinical Professor, Mississippi State University, USA.

Title: It's All about Type.

18:00-18:30

Antonio Balloni, Researcher, University of Campinas, Brazil

Paulo Resende, Research and Projects Financing, FINEP, Brazil.

Miguel Juan Bacic, Professor, University of Campinas, Brazil.

Title: Brazil of the 21st Century: Strategizing with the Sociotechnical Management Approach.

18:30-19:00

John M. Medellin, Chief Technical Officer, TruDecision, Inc. and Medellin Applied Research Concepts, LLC, USA.

Title: Generation, Regeneration and Validation of Binary Secret Keys through Blockchain in IoT Devices.

19:00-19:30

Sobitha Samaranayake, Associate Professor, University of Wisconsin, USA.

Title: An Interactive Decision Support System for College Degree Planning.

Fuad Aleskerov

Professor, HSE University, Russia

Ekaterina Shakhaliyeva

HSE University, Russia

Maria Tarasova

HSE University, Russia

&

Maria Toropova

HSE University, Russia

An Evaluation of the Quality of the Enrollment in Russian Higher Education with the Priority Profile Based on Mathematics (2015-2020)

Using the data about the enrollment based on 625 Russian universities according to the results of the Unified State Examination (USE) from 2015 to 2020 we identified three categories of BS programs related to the profile of mathematics: economics and mathematics, computer science and mathematics, physics and mathematics.

A statistical analysis is provided for all of the categories. The changes in average and most frequent indicators in the period from 2015 to 2020 are studied, universities with the highest and lowest scores on entrance examinations for admission are highlighted in every year of the shown period.

We propose a model evaluating the quality of enrollment and analyze this parameter from 2015 to 2020 with it. The model shows the quality level (QL) for the entrance exams required for admission to each of the categories of programs in the universities on the free of charge and tuition fee basis.

The quality level for all categories for studies for tuition fees hit a lowest level in 2016 and 2017, then started to rise. The fastest growth is observed for economic programs.

Abeer Asli-Badarnah

Professor, Bar-Ilan University, Israel

Duaa Abu-Elhija

Professor, Bar-Ilan University, Israel

Elinor Saiegh-Haddad

Professor, Bar-Ilan University, Israel

&

Rachel Schiff

Professor, Bar-Ilan University, Israel

The Role of Language and Literacy Intervention in Narrative Skills Development in Arabic Speaking Kindergarten Children: A Study of Macrostructure Features and Mental State Terms

Narrative abilities are correlated with the development of literacy and predict later academic achievements, including both language and literacy (e.g., Pinto, Tarchi, & Bigozzi, 2016). The Literature on narrative production distinguishes between two different levels of discourse: microstructure and macrostructure (e.g., Petersen, Gillam, & Gillam, 2008). Most macrostructure analysis is based on the framework of Story Grammar (SG) elements which proposes a universal organizational model for narratives in terms of setting and episode key structure (Stein & Glenn, 1979). Causal relations relate to how macro structure elements such as characters, setting, goal, attempts, and outcome are connected within and across different episodes of a narrative (Trabasso et al., 1989). Mental state terms (MSTs) are defined by the ability to form mental representations of the narrative characters considering the listener's perceptions, perspectives, thoughts and feelings (Labov's, 2013). Explicit narrative macrostructure intervention may support preschool children to develop expressive narrative forms (Heikamp, 2013). The purpose of the study is to study the role of a 20-week (60 meeting) language and literacy intervention program on the narrative skills in 5-year-old Arabic speaking children (N=100). Narrative skills were tested by analyzing the macrostructural features (SG) and causal relations, as well as the use of MSTs in two groups: an intervention group (50 children) and a control group (50 children). The two groups were tested before and after the intervention. The intervention program as well as the post and the pretests targeted oral language, metalinguistic awareness, emergent literacy skills, and cognitive measures. The narrative task asked children to retell a story from a series of 6 pictures. The child's production was recorded transcribed

and coded for SG, SMTs and causal relations. The results indicated higher scores on the posttest in the intervention group on macrostructure as well as causal relations as against the control group. The results also showed that the perceptual sub-class of MSTs yielded higher scores in the intervention than the control groups on the posttest. Regression analysis was then used in order to examine the contribution of MSTs and causal relations to the prediction of narrative macrostructure in Arabic. In the regression, children's receptive vocabulary, expressive vocabulary, listening comprehension and syntactic skills were entered in Step 1, followed by causal relations, and MSTs in Step 2. The findings revealed that the magnitude of contribution of causal relations and MSTs to narrative macro structure were higher after the intervention and they contributed unique variance beyond the oral language skills of receptive vocabulary and listening comprehension which were also significant predictors. In pre intervention, after controlling for receptive vocabulary, expressive vocabulary, listening comprehension and syntactic skills, causal relations were not significant, and only receptive vocabulary made significant contribution to the prediction of narrative macrostructure, accounting for 11% and 17% of the variance, in steps 1 and 2, respectively. However, after intervention, receptive vocabulary, expressive vocabulary, listening comprehension and causal relations all made significant contribution to the prediction of narrative macrostructure accounting for 24% and 29% of the variance, in steps 1 and 2, respectively. Causal relations remained significant and made up 20% of the contribution to the prediction of narrative macrostructure. Receptive vocabulary, expressive vocabulary and listening comprehension were significant, while receptive vocabulary made the largest contribution. These results underscore the effectiveness of the intervention program in enhancing the role of language and narrative skills in story macro structure ability in young Arabic speaking children.

Serwan Baban

Chief Scientific Advisor, Kurdistan Region Presidency, Iraq

Private University Governance and Management in Developing Countries

Private universities are relative newcomers to Developing countries and they are multiplying at an exponential rate. They tend to be self-financing and operate like an enterprise generating profit. These universities are facing challenges in delivering graduates capable of responding to, and meeting evolving market needs, contributing to nation building, sustainable development and wealth creation. Hence, for these Universities to become relevant they need to move away from the traditional model by altering their governance, management, organization as well as academic approaches and priorities in order to operate in the context of developing countries and to contribute effectively towards national development. Evidently, there is a need for developing practical regulations and frameworks for enhancing and improving the essential functions in private universities.

This paper discusses the essential aspects of University good governance and management and proposes a simple structure to match the university 'Form' (the structure) with its 'Functions' (management, governance and operations). This approach can result in aligning a university's decisions with its strategic intentions of responding to evolving employment market needs in developing countries including technology advances, problem solving and nation building.

Antonio Balloni

Researcher, University of Campinas, Brazil

Paulo Resende

Research and Projects Financing, FINEP, Brazil

&

Miguel Juan Bacic

Professor, University of Campinas, Brazil

Brazil of the 21st Century: Strategizing with the Sociotechnical Management Approach

This paper is an update from the previous publication: Balloni, Resende, and Targoswski (2012). Improved consideration towards the 21st Century is presented in this version compared to the previous publication in 2012. Moreover, all previous considerations from the publication of 2012 have been reconsidered and recontextualized.

Over five centuries after being discovered, Brazil has emerged from a reality of primitive land and has become a multi-ethnic country, considered today one of the world's largest economies. With an integrated territory, Brazil aims to be projected as a relevant player in the complex interplay of world powers; however, the world geopolitics presents complex interactions that depend on assertive Brazilians decisions makings. Based on a sociotechnical perspective, a model of participative management represents the opportunity to the emancipation of political thinking capable of formulating a vision for the long-term future. Within this perspective and, given the sociotechnical approach, the present work aims to promote innovation in the public/private manager's thought, presently consolidated in short/medium-term vision. In this "Participatory Model of Sociotechnical Management," it is proposed as the tool of change, as being the sharing of information and implementing a shared vision of the future. These sharing -information & vision- must be incorporated by all Brazilian Educational System levels and its Societal Decision-Making as the fundamental strategic principles for a sustainable Brazil to the Brazilian citizens. The consolidation of the sociotechnical perspective can assist in the tremendous national challenges that may occur throughout the 21st Century.

Liat Biberman-Shalev

Head of Education Department, Levinsky College of Education, Israel

Approaches to Global Education in Teacher Training

Education policies worldwide deal with the question of how to best prepare students for participation in a globalized society. Consequently, teacher-education programs seek to equip pre-service teachers (PSTs) with suitable knowledge and pedagogical skills to prepare students to perform well in a changing world. The global education perspective was introduced as an appropriate orientation for this purpose; nevertheless, its implementation in teacher education is still a work in progress.

The research objectives are to identify the factors included in PSTs' perception of global education and the factors that motivate them to be trained to teach it. Integrating these factors in the design of teacher-training programs that focus on global education may yield effective results. Adopting the definition of Ferguson-Patrick, Macqueen & Reynolds (2014), the objectives of global education as perceived in the current study are to develop young people's ability to appreciate cultural diversity, pursue social justice, build a sustainable future, and develop global relationships, while inculcating open-mindedness and a sense of agency.

Relying on the study of Wang, Lin, Spaling, Odell & Klecka (2011), Ferguson-Patrick and colleagues (2014) argued that there are two main approaches to global education that should be promoted in teacher education: (a) a skills-based approach (i.e., focusing on 21st-century skills associated with STEM and intercultural communication); and (b) a critical approach (i.e., focusing on developing citizens committed to the principles of social justice and human rights).

A total of 105 PSTs in their freshman year completed a survey pertaining to their (1) demographics; (2) knowledge of global issues; (3) information sources regarding global issues (4) perceptions of global education; and (5) motivation to be trained in a global education perspective. The constructs that emerged from the Exploratory Factor Analysis (EFA) indicated that PSTs perceive the global education perspective to be based on two main approaches: (1) the social justice approach; and (2) the knowledge, skills, and multi-cultural approach. Using the paired samples t-test revealed that the social justice approach was the most prevalent approach among this cohort. EFA also revealed three motivational factors for training according to the global education perspective: (1) instrumental-competitive motivation; (2) didactic-

multicultural motivation; and (3) social justice motivation. One-way repeated-measures ANOVA demonstrated that among the three, the didactic-multicultural approach was the most prevalent factor.

Consequently, programs intended to train teachers according to the global education perspective should combine knowledge of both global content (especially as related to social justice) and global pedagogy. Furthermore, a focus on didactic strategies will give teachers a practical way to construct their professional identity as social justice agents.

Rina Bousalis

Assistant Professor, Florida Atlantic University, USA

**The Oral History Project:
Discovering the Community's Knowledge, Experience, and
Perspective of Events and Issues**

Given the present-day need for civics (citizenship) education in U.S. K-12 grade levels, growing university interest in engaging students with the community, and instructors seeking ways to make social studies education curriculum relevant to pre-service teachers, I secured a Faculty Curriculum Grant from my institution's Office of Undergraduate Research and Inquiry's (OURI) *Distinction through Discovery* program to collaborate with undergraduate students/pre-service elementary teachers in a research project titled *Rebuilding Elementary Civics Education as a Creative and Constructive Process*. This presentation discusses a study conducted in a Florida university's social studies methods courses that expanded the civics portion of the syllabus by supplementing the curriculum with an Oral History Project, a classroom-based project in which 38 elementary pre-service teachers took part in as students and researchers. By conducting an oral history/interview with community members who shared first-hand knowledge or experience about a historical event or current issue related to civics (e.g., immigration, government, law, diversity, war, poverty, inequalities, civil and human rights, rights and responsibilities, etc.), pre-service teachers analyzed topics and human perspective in dialogue to determine: a) how the interviewee's shared experience impacted their view of the topic, b) how the interviewee's shared experience impacted them personally, and c) how the interviewee's story impacted their future teaching. Prior to conducting the interview, pre-service teachers acquired background knowledge about the topic their interviewee would speak about and designed a sequential list of 10 open-ended questions which they would ask their interviewees to respond to during the interview. The findings reported that pre-service teachers gained a better understanding of civics through the eyes, minds, and voices of community members (primary sources) who had lived through notable events and who shared their experiences. Additionally, pre-service teachers recognized the gaps that exist between textbook narratives and interviewees' accounts, and based this discrepancy on lack of human history and perspective in secondary sources. As one pre-service teacher reported, when hearing a story "directly from a person's mouth," it offers greater insight of a topic

rather than reading about it in a textbook or on social media. Moreover, pre-service teachers expressed how the interviewee's stories positively impacted their content knowledge, their own lives, and their future teaching. As it is vital that young students be pre-equipped with civics knowledge during their elementary school years, elementary pre-service teachers can help build a foundation of civic engagement with their future students. University systems have the potential to create a network of human resources that can add to the curriculum of university teacher education methods courses and provide pre-service candidates authenticity of global issues and events. The Oral History Project is an example of such an endeavor which allows elementary pre-service teachers to form a bond with the community and gain real world civic knowledge and authentic social studies.

Lars Brinck

Head of Research & Associate Professor, Rhythmic Music
Conservatory, Denmark

Promoting Cooperative Creativity Improvisation as Learning in Jazz Settings and the Role of Technology

In a globalized, digital world, as robots and technology overtake more and more human tasks, it becomes still more complex for human beings to navigate adequately among digital tools and their options. It becomes increasingly crucial for us –in cooperation with others – to learn select, adjust, and negotiate such work processes creatively, collectively. Considerable amounts of research have addressed such issues from individual and didactical points of view, but the research reported here takes a different offspring:

Looking at cooperative creative practices outside the class room, not guided by educational aims and goals, purposely creative contexts, namely jazz ensembles performing and developing collective improvisations through detailed application of digital tools, constitute the empirical approach.

Through ethnographic field work, including participant observation, qualitative collective interviews and ethnographic accounts, a series of situated learning theoretical analyses point to several areas of significance related to, how cooperative creativity in the jazz bands is both productive and challenging. Main analytical findings include perspectives of *(ex)changing knowledgeabilities, attending to aboutness and designating access.*

The suggested analytical concepts are discussed critically in relation to their relevance to learning and teaching environments, not only within the arts but also in more general educational settings, where technology plays a pivotal role and collaborative creative efforts are crucial.

Orit Broza

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Learning by Creation in Scratch in Teacher Training Education Program

In the digital age in which we live, children and adults spend long hours in front of various screens and our lives depend on technology to a growing degree. Over time, hardware, software, and the human factor will become increasingly intertwined and the blurring between the digital and real worlds will increase.

Moreover, according to a report by the World Economic Forum (2018), many students in the future will engage in professions that do not yet exist. What is certain is that there will be technology. In fact, the more technology is involved in our lives the more programming will be a skill that will be required in all professions in the future, just like reading and writing. Therefore, it is our responsibility, especially in education, as teachers' trainers, to prepare future teachers for these changes and to try to bridge this gap.

The course "Play with me in Code" was designed in collaboration with CET, as a modest step in exposing pre-service teachers to computational thinking and programming in the elementary school training program at a College of Education.

The added value of programming using Scratch in the context of teacher education lies not only in familiarity with a programming language but with high-order learning processes encouraging learner activism, collaboration, logical thinking development, tackling big problems by breaking them down into smaller problems, identifying and using common solutions to common problems and more (Resnick et al., 2009; Resnick, 2012).

The aim of the present study is to explore pre-service teachers' attitudes of towards technology and programming in general, the way they face challenges of coding with Scratch, supports they used and their thoughts about such a course in the future. To this end, students' sense of competence were examined by using a questionnaire distributed at the beginning and end of the course; blogs and reflections were analyzed in which they described how they faced challenges and supports they used.

Findings indicated that the learning environment encouraged autonomy and creativity. Autonomy was manifested on several levels, from the stage of choosing how to learn, resources distributed, type of

game and content it would address. The social aspect in the virtual spaces became significant when students approached their colleagues for help when confused. This means that social support promoted learning in the environment. Distance actually contributed to students' personalized learning. They governed their learning pace. The way they chose to use tools in the environment can be illustrated as a "playground" where everyone chooses their own resources. Transferring responsibility for learning to students while setting a clear performance goal is what motivated personalized learning because everyone had to understand how they learned, what resources to use and how.

Manuela Concioiu

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From Teaching about Diversity to Learning on Diversity in the Romanian Educational System

Diversity is in human nature. It is our way to face the challenges from a continuously changing world, originated from work and study mobility, international migration and globalization. Biodiversity and societal diversity created a suitable environment for education, leading to the concept of multicultural education, so much required in today's student's development. This metamorphosis faced by the European societies refined the education providers and policy-makers, coming to a paradigm shift, from "Teaching about diversity" to "Creating diversity, teaching for diversity, learning in diversity!" Lack of knowledge base on the preparation of teacher educators, of coherence concerning teachers' training to approach classroom diversity in secondary education, lack of systemic policy approaches towards inclusion and diversity and diverse student teachers, established the framework of this study. Can we answer these questions: Do educators understand the learners' need for integration in a multicultural environment, within a school context? Are teachers prepared for diversity in the classroom? What does it mean to teach for diversity and in diversity? Are there functional methodologies for teacher trainers? How do we address these challenges? By providing an insight comprehensive view of classroom diversity management in secondary education, for both private and public formal educational institutions, which would be of much help for European EU state members. Raising awareness on the importance of well-prepared teacher trainers for diversity in Europe and harmonizing teacher intercultural competences within a European framework integrated into the curricula will point to societal diversity as an asset that applies to school-related diversity. EU state members should prepare teachers for diversity and in diversity, not regarding diversity, by promoting multicultural education as a normal teaching-learning environment. Furthermore, insights on how teachers deal with students, how do they implement the strategies of this new approach that bridges cultural competences are shown.

Toyia Curry

Instructional Dean, Arlington Independent School District, USA

&

Sharon Waller

Assistant Professor, American University of Ras Al Khaimah, UAE

Using Formative Assessment to Improve Student Achievement in Reading: Reflections from the Field

The ability to read by the completion of the fourth grade is essential for a student's future academic and social success. With only thirty-four percent (34%) of fourth grade students reading on grade level, the importance of improving the instruction of reading cannot be overstated. The purpose of this study was to examine teacher's perceptions of the efficacy of formative assessment as a means of improving student's reading performance. The study utilized a qualitative methodology to interview, record, code, and analyze responses to eight open-ended questions relating to the efficacy of formative assessment. Participants included fourteen (14) language arts, English as a second language (ESL) teachers from an urban predominately Hispanic Title I public elementary school, grades kindergarten through sixth, in a large metropolitan city in North Texas. Findings identified nine major themes ranging from the identification of student's levels of performance to using formative assessment to empower higher levels of student achievement. The findings are considered appropriate to guide future practice and research.

Dursun Egriboyun

Lecturer, National Defence University, Turkey

The Mediation Effect of the Organizational Support and Communication Skills to the Job Satisfaction in the Learning Organizations

The purpose of this research was to determine the mediation effect of the organizational support provided to the administrators and teachers and their communication skills to their job satisfactions in the schools that are a learning organization at the same time. The participants of the research were composed of the school administrators and teachers who were employed in the schools in the center of Ankara, Bilecik, Bolu and İzmir Provinces and joined voluntarily to the research. In the research, it has not taken the universe and sampling, instead of this the purposeful sampling method has been used. The research groups were comprised of 300 administrators and teachers.

This research is a study in the relational screening (survey) model. The research is both descriptive and explanatory in terms of its purpose because in the theoretical framework learning organizations, communication skills, organizational support and job satisfaction have been addressed in all their parts and tried to be defined with reference to all the various perspectives and approaches.

In the research, the data were collected from the administrators and teachers through a scale. According to the results of the research, it was not found statistically meaningful that the learning organization practices had a relationship/regression on the job satisfaction perceptions, and the organizational support provided to the administrators and teachers and their communication skills did not mediate to the job satisfaction in the learning organizations.

Angela Farmer

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It's All about Type

The future world will likely reflect upon these times during the 21st century as times of paramount change, evidenced by a struggle for survival by oppressed groups within the population who have, historically, been underrepresented, undervalued, and undermined. This manuscript offers transparent and genuine evidences of this struggle shared from current women in the honors college at a top research university located within the Southeastern United States.

Using the Myers Briggs Type Inventory tool with a certified trainer, the women are presented anonymously. The outcomes of the study offer insightful data regarding not only 21st century women's perspectives, but unvarnished feedback from this unique population born since the tragedy of 9/11 and now living through post-pandemic and altered, academic environments. Their personality types and interviews provide evidence that Type and its nuances have specific meanings and applications to women which are independent of the general population statistics which appear to better align with men.

A gendered identity for which this populace has experienced filtered opportunities, it is clear from this study that their unique facets and interpretations are most worthy of analysis. Much like Amazons of lore, this population of young women offers a very strong and independent presentation. They share not only their MBTI preferences, or Types, but also filter their perceptions through a female lens, offering a most unique reality which had historically been comingled with males as one, homogenous composite. Offering unvarnished and stoic realities, their stories offer a more detailed and insightful understanding of what it means to prefer a certain Type as a woman in 2020.

Thomas Fehlmann

Senior Researcher, Euro Project Office AG, Switzerland

The Fixpoint Combinator in Software Testing - A Step towards Autonomous Testing?

Combinatory Logic is a very interesting algebraic structure. It allows representation of all computable structures that exist. This means, Combinatory Logic is Turing-complete. However, contrary to Lambda Calculus, with which it is closely related, there exist no variables in its terms. Terms are called Combinators and look like some sort of assembly language for mathematical logic. Combinators usually become quite long.

There exists just one algebraic operation, namely combining two terms, yielding another valid term of Combinatory Logic.

There are some interesting combinators. Among these, the *I* combinator (identity), the *K* combinator for extracting parts of another term, and the *S* combinator that substitutes parts of a term by some other combinator.

Like any logic, the question is whether interesting models of Combinatory Logic exists. A model is a set of terms together with an operator that is closed under combination, contains models for the aforementioned *S-K-I* combinators, and is non-trivial. Such models exist; the best-known is the Arrow Term model, consisting of the power set over all formal terms of the form

$$\{x_1, x_2, \dots, x_n\} \rightarrow y$$

where x_1, x_2, \dots, x_n and y are arrow terms or predicates describing some valid statements in the model. Models that have been investigated include models for how the human brain thinks, i.e., does reasoning; models for explaining what Aristoteles invented instead of mathematical relations – which he did not actually include in the Organon, surprisingly, and models for testing structures, e.g., software programs. This is quite a large area of application, and you may wonder why Combinatory Logic is not more widely known.

One reason is that one of the most interesting, and puzzling, combinators is the Fixpoint Combinator. Curry called it the paradoxical combinator because of its stunning properties. For the model of brain reasoning, it yields wonderful explanation why we are capable to take decisions. For testing, this is yet open and surely obvious.

This paper, or talk, explains first the Fixpoint Combinator in the models described above and applies it to software testing. Autonomous Real-time Testing, or ART, describes the attempt to create test suites for software with the methods of Artificial Intelligence (AI). The size of such test suites is enormous and cannot be handled without intelligent focus on relevant test cases. In theory, the Fixpoint Combinator yields a minimum solution to complex problems if such a solution exists. This is important because testing is extremely costly for large and complex, software-intense systems. In the words of Curry, this “paradoxical” construct might help us in overcoming the barriers to autonomous vehicles and truly intelligent things.

In short, we explain that studying Aristoteles’ Organon might help us in mastering the future of software-intense systems.

Nerea Gómez Fernández

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&

Mauro Mediavilla

Professor, Technical University of Valencia, Spain

Causal Effects of the Use of ICT on Academic Performance: Evidence from a Census Survey in Madrid

Information and communication technologies (ICT) have been and are a fundamental part of economic, social, and technological changes in society. Obviously, educational institutions have not been left out and have been affected by the arrival of ICT, which has meant and still means a major challenge for all the agents involved in the educational process. The growing presence of Information and Communication Technologies (ICTs) in schools makes it necessary to analyze the effect of the use of these innovative tools in the students' learning process for guiding educational policy decisions in a reasoned way. This research aims to investigate empirically what effect the use of ICT resources to carry out projects or do exercises in class has on academic performance. Specifically, we focus on analyzing the case of the Community of Madrid in Spain. We consider that the analysis of a region in Spain is particularly relevant, given that in Spain as a whole there is still room to expand the use of ICTs in schools given that the majority of teachers still do not consider them an important factor in the teaching process according to PISA 2015 data. Furthermore, in Spain the competence in education is delegated to the autonomous communities, so it is appropriate to focus on the concrete analysis of a region. For this purpose, we use data from the individualized evaluations carried out at the end of the 2016-2017 school year in the fourth year of secondary education in all the schools in the Autonomous Community of Madrid. With these census data we estimate different models with varied methodologies that allow us to establish causality between the use of ICT and the academic performance of students, as well as to distinguish whether these effects differ between students according to the quantile of performance in which each student is placed. Our results show that greater use of ICT in the classroom is associated with better academic performance in English and academic mathematics. When looking at the results of the quantile regressions, we find that the positive effect of the use of ICT is particularly beneficial for students at the bottom part of the scores distribution in English. On the contrary, in Spanish, social and civic competence and academic mathematics this positive effect

exists but is only sustained for students in the middle and upper percentiles of academic achievement. Based on these results we point out in our conclusions hypotheses on possible explanations and emphasize the need for further research on the use of ICT in schools, in order to learn how to apply these tools appropriately to reap the full potential benefits of improved academic performance.

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Kate Korneva

Graduate Student, Oklahoma State University, USA

&

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Pivot from an On-Site to Virtual Reaccreditation Visit: One American University's Interior Design Program

In May 2020, during ongoing preparations towards third party, June 2021 reaccreditation, a University interior design program faced the unprecedented question of whether or not to shift to a virtual visit instead of the standard, three-day, on-site visit.

For an interior design program to remain accredited, mandated on-site reaccreditation visits occur every six years. Preparations require the collection of up to three years of documented student work and detailed program reports summarizing evidence of compliance with accreditation standards. The on-campus site visits are planned well-in-advance and require tremendous coordination including numerous logistics: lodging, exhibits, interviews, and tours. Additionally, they are time-consuming for faculty, students, and site visitors, and use considerable financial resources with the cost borne by the University programs.

Site visitation teams are composed of unpaid, credentialed, pre-qualified volunteers who participate to improve the profession (CIDA, no date). COVID-19 has created uncertainty as to site visitors' travel plans since air travel, hotel stays, and in-person meetings are discouraged in the U.S. for the foreseeable future. Pandemic concerns, added to the aforementioned significant time investment and lack of compensation, therefore, might make volunteers reluctant to participate in on-site reaccreditation visits.

Addressing the above considerations resulted in a pivot from an on-site visit to a virtual visit for one American University. This included changes to the site visit budget, creation of new videos of program facilities and on-campus tours, and facilitation of video communication interviews. Resolution of myriad technical issues involved the creation and storing of all-digital copies of diverse student work (sketches, written papers, 3-D models, floor plans and other

technical drawings, spreadsheets, audio/video recordings of student live presentations—created in a variety of media and formats). Timelines, activities, and examples of deliverables for the pivot to virtual site visit will be shared in the current presentation, as well as a comparison of current and projected expenditures and activities.

Although there were many unknowns, shifting to a virtual visit seemed the rational response to pandemic uncertainties. The projected total costs were less with a virtual visit. Lodging, airfare, and food costs were eliminated; however, new expenses for data storage, curation of student work website, and extended review access periods were incurred. The shift to a virtual site created challenges and stretched faculty members in unexpected ways, including producing and collecting student work while simultaneously curating it. Preparation methods can now be developed for other universities who may also seek accreditation through virtual site visits.

Although challenging, the shift from site to virtual visit could be carried successfully into the future, post-pandemic arena as a more sustainable (i.e., reduction of cost, materials, and volunteers' travel time) model for accreditation site visits.

Leila Kajee

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&

Salejee Patel

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Translanguaging: A Step towards Social Justice Pedagogy in the English Classroom

One is reminded that “Everyone has the right to education in an official language, or languages of their choice in public educational institutions where that education is reasonably practicable” (Constitution 1996, Chapter 2 Bill of Rights, section 29, subsection 2). This remains significant in the South African context as English is the popular choice as medium of instruction and given preference over African languages (Mkhize 2016). Since multilingual learners are often situated in monolingual schools, discrepancies arise in the implementation of linguistic social justice and disempower multilingual youth. The purpose of this research was to explore translanguaging as a means of advancing linguistic social justice through frameworks of social justice and humanizing pedagogy. This study aimed at examining whether translanguaging promotes social justice in the classroom through humanizing experiences for teachers and learners. As such, the study advances social justice as a humanizing pedagogy and translanguaging as a social justice endeavor.

Utilizing an interpretivist case study methodology by drawing on semi-structured interviews with teachers and focus group interviews with learners from a secondary school in Johannesburg, South Africa permitted an investigation of translanguaging and linguistic social justice in its real-world context. Specifically, the unit of investigation included English Home Language teachers and learners in Grades 8-11. Findings include a contradiction of the social realities of learners, as active users of translanguaging both inside and out of the school. Translanguaging as a tool in providing linguistic equality and epistemic access to knowledge and comprehension is affirmed in this study as both the teacher participants along with multiple learner responses from focus group interviews claim a greater understanding of English subject matter, contextualization of learning and aid in vocabulary building, occurring, with home languages as an underlying existing linguistic structure. Further findings suggest learners as maintaining conceptions of *Ubuntu* translanguaging (Makalela 2016) in expounding

on the way in which one juxtaposes ways of knowing and meaning to move beyond a current state of understanding. Key recommendations include in-service teacher training of African languages as well as enabling teachers to interpret policy documents beyond their prescriptions.

Romalda Kasiliauskiene

Lecturer, Head, Department of Arts and Social Work, Marijampolė
College, Lithuania

Preconditions of Tolerance Development at Higher Educational Institution

Educational institution and the teacher are responsible not only for knowledge conveying to the student, but also for personal development. It is necessary to take care of value integration into educational content. Values have to become part of the spirit of the whole educational institution, to be integrated into the educational environment and relationships. Tolerance is one of the most important aspirations for educating young people and shaping humanistic attitudes and respect for human values. The importance of developing tolerance as a core of democratic society is underlined in the documents of the Council of Europe. Increasingly, in assessing social skills in the labor market, there is a clear need to educate tolerant citizens, especially teachers who are able to communicate and collaborate with others, constructively resolve conflicts, think democratically, and respect other people's beliefs and opinions. To develop a tolerant personality is a long and difficult process. The relationship between teacher and learner must be based on mutual respect and trust, the principle of equality between the teacher and the learner as a personality, since only then there can be mutually beneficial cooperation that enables the development of tolerance in the community of the educational institution. Tolerance of the teacher is of particular importance to the learner's tolerance. This article defines the concept of tolerance, examines the true conditions of tolerance, highlights the development of a tolerant personality, that is part of the development of a common personality, due both to internal and external factors, describes the aspects of tolerance development and reveals the preconditions that make up the development of tolerance.

Afreen Khan

PhD Student, Aligarh Muslim University, India

&

Swaleha Zubair

Associate Professor Aligarh Muslim University India

**Multivariate Big Data Analysis and Ensemble Learning:
Correlation COVID-19 Prevalence in India**

NOT
AVAILABLE

Pirkko Kivinen

Senior Lecturer, Tampere University of Applied Sciences, Finland

&

Hannele Laaksonen

Principal Lecturer, Tampere University of Applied Sciences, Finland

**Workplace Learning through Digital Work Supervision and
Peer Support**

NOT
AVAILABLE

Hannele Laaksonen

Principal Lecturer, Tampere University of Applied Sciences, Finland
&

Sari Himanen

Principal Lecturer, Tampere University of Applied Sciences, Finland

**The Leadership Competence Produced by a Master's
Degree Program at a University of Applied Sciences and
the Future Competences Required at Work**

NOT
AVAILABLE

Carsten Lecon

Professor, Aalen University, Germany

E-Learning for Media Ethics

Mass media have heavily impact to the opinion formation and often the resulting decision process. This can be observed in politics as well in society. When relying on information, which sounds well, but is eventually incorrect, the taken decision can lead to dramatically results. Therefore, a strong evaluation competency is necessary. This requires media consumption with critical self-reflection. Also, one should aware of the distinct characteristics of information providers (newspaper, news portals, videos, etc.) and the communication channels (television, internet pages, social media/messenger services, etc.). A high level of education is very helpful – which should be the case at students of universities. However, the presentation of the media could easily be tempting for manipulation purposes (using advertising psychology, for example). One should aware of this danger, among other by knowing the methods to change or even falsify the information which will be presented. Beside on the analysis of the actual content, it is helpful to know, how simple it is to manipulate digital media, for example to rip images or texts out of their context. Instead of the obvious importance, the ‘topic media’ ethics tends to be neglected at universities: Mostly, the curriculum is too full. Occasionally, individual talks are offered, for example as part of extracurricular studies. With regard to provide knowledge about this topic sustainably, we present an e-learning solution: An appropriate mini course for self-regulated learning. In particular, these main chapters are treated: Definitions (ethic, moral,...), journalism (boulevard journalism, emotional effects of images/ photos, reports on selected areas), media scandals, fake news, ethic in entertainment and television, advertising, internet ethic (for example cyber mobbing, social bots, etc.), voluntary self-regulation, media laws. The actual context is enriched by many image and video examples. In order to realize a mini course, we use a software tool, which was developed at our university before. This tool allows combing different media assets (text, images, videos, audio, quizzes) on one page (HTML5), which are connected (via an XML description) to an HTML course. In this way, this course can be used platform-independently (PC, tablet, mobile device). Because of the separation of the content, the structure and the layout, content can easily be added, modified, replaced or removed. In this way, current findings (quasi daily events) in the topic ‘media ethics’ can be take into account promptly. The tool

offers the possibility to specify so-called learning trails. In this manner, the same course can be adjusted to the special needs and prior knowledge's of the target group: For example, computer scientists are interested in detailed techniques to manipulate images, whereas students of healthcare management may be more interested in psychological aspects. Currently, some students compile and structure the already collected information. The initial version of the mini course will be used end of winter term 2020/2021 in a media computer science lecture: The students learn not only how to create digital media; the course creates an awareness of the responsibility for the handling with digital media.

Niclas Lindstrom

Associate Professor, Umeå University, Sweden

&

Lars Samuelsson

Associate Professor, Umeå University, Sweden

Moral Taste and Moral Education – An Interview Study

In recent research on moral psychology, the human consciousness has been compared to a tongue, with different taste buds, which together can cause a variety of sensations. According to this theory, people in general have a preparedness to react to situations, which can provide opportunities or pose threats in a social context. Moral psychologist, Jonathan Haidt (2012, 2013), has described these receptors as pairs, for example: care/harm, justice/cheating, loyalty/betrayal, authority/subversion, holiness/degradation, and liberty/oppression. Which of these foundations the individual develops a taste for depends, largely, on the social and cultural context (Graham, Haidt & Rimm-Kaufman 2008). Hence, the choices teachers make of which issues to address and in what way can contribute to a learning environment that influences their pupils' moral outlook. The purpose of this study is to investigate which of these moral intuitions or taste preferences that teachers want to endorse and cultivate in their pedagogical practices. Against this background, a number of qualitative research interviews were conducted with experienced teachers in the non-confessional subject religious education (RE), who have a particular responsibility for moral education in the Swedish school system. The interviews were partly based on a modified version of the Moral Foundations Questionnaire, which was deliberately developed in order to determine the participants' moral taste, and the participants were asked to elaborate their answers (Graham, Haidt & Nosek, 2008). The results of our study indicate that the participants tended to favor care and justice over loyalty, authority and holiness. As one of the participants puts it: "many of my examples relate to the weak and vulnerable or the ones that are denied their rights in society... these pedagogical choices are based on the content of the curriculum but also mirror my own preferences". In this paper we will analyze the interviews with the RE teachers and critically discuss the consequences the moral foundations theory have for moral education.

Alex MacQuarrie

Senior Lecturer, Griffith University, Australia

Using a Scholarship to Promote Scholarship: A Unique Approach to Learning and Teaching

Paramedicine as a new academic discipline is developing a unique body of evidence through research. Students need exposure to the principles and practices of research. The challenge was to encourage engagement by students with research. We noted a lack of student connection with research in our university, reflected by low enrolment in higher degree by research despite robust enrolments in the undergraduate program. We wanted to change that.

In a unique approach, we proposed the *Dare to Know Student Paramedic Research Scholarship*. Rather than monetary value, recipients were encouraged to create a project and received mentorship from paramedic academics. The goal was to encourage student participation in research by providing a supportive and accessible environment in which the students could explore their area of interest. Additional aims were to increase supervisory capacity among early career paramedic academics and to promote a team approach to research activity through the construction of bespoke inter-disciplinary supervisory teams. The scholarship program established a process to facilitate the effective investigation and implementation of student driven initiatives, in turn unlocking the potential for learners to contribute to the teaching process. We convinced school administration of the value of the program and the scholarship program launched.

Since inception in 2019, outputs of recipients and their mentors included conference posters (national and international), peer-reviewed journal articles, and conference presentations. Importantly, many recipients have gone on to continue their studies in an Honours program, bolstering a previously undersubscribed program. All recipients have been given a platform to learn new skills in a supportive setting. Recipients suggest the impact of winning the scholarship has been overwhelmingly positive. One student, who studied mental health in paramedicine said she felt more ready for the career she was about to start - more confident, more informed, more empowered and with motivation to continue research. Another recipient explained how the scholarship “bridges a gap with unprecedented access to mentorship from academics...they [the academics] were enthusiastic and supportive”.

Unlocking paramedic student creativity with a new way to learn was key to the success of the project. Our paramedicine students brought their enthusiasm and this served to motivate them to succeed in a very non-traditional way. Scholarship recipients were volunteering to take on additional, non-assessable work whilst working towards their paramedic degree demonstrating that intrinsic motivation was very influential. External recognition was another key factor. Winning a scholarship is recognition of achievement and can, in certain circumstances serve as a predictor of student persistence and academic progression. Academics who supervised these scholarship students reported high levels of student engagement and an enthusiasm to develop further projects on the back of what they had already achieved. Using a Scholarship to promote scholarship is encouraging new paramedics to value and contribute to creating new knowledge for their profession.

Jessica Maluch

Assistant Professor, American University in Dubai, UAE

**The Development of Primary Students' L1 Arabic Language
and Literacy in English Medium Schools**

NOT
AVAILABLE

John M. Medellin

Chief Technical Officer, TruDecision, Inc. and Medellin Applied
Research Concepts, LLC, USA

Generation, Regeneration and Validation of Binary Secret Keys through Blockchain in IoT Devices

The main objective of this article is to operationalize a mathematical root of trust that can be scaled into protection for IoT devices through cloud architectures. This document builds on previous research for Blockchain design patterns and various software architecture principles published in various conferences and journals. The initial discussion focuses on uniqueness in gated arrays and the generation of 4-way binary keys that are each 4096 bits in length. Total randomization is introduced into the generation of the input and sequence keys giving a unique secret key. This key can next be stored in the cloud image of a IoT device (the IoT device communicates only with a specific port and mode). The probability of successful attack is computed to be in the billionths and by itself is resilient to similar transformations as available in SHA 512 at a minimum.

The next part of the paper speaks to the generation of “epochs” where machines appointed to be managers generate the next epoch of key attributes, admit, remove and notify members of existence of new keys. The voting, duration, frequency and manager selections are also randomized, thus adding to the resiliency of the overall system (this uses the previously published D-RAFT algorithms). This algorithm does not require constant update of IoT cache; only until such time as communication with others is initiated or a request is received. This substantial savings in processing requirements is significant in the IoT design paradigms. A detailed discussion of the management of the blockchain is provided as well as the necessary blockchain block that enables this distribution.

Finally, the paper concludes with an example for implementation dialogue using standard TCP/IP communication structures and secured capabilities.

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&

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Introducing Indoor Bouldering to High School Students: A Self-Reported Perception Analysis of Various Short-Term Training Regimen

Bouldering is an increasingly popular climbing discipline that was to make its debut at the Tokyo 2020 Olympics. In particular, indoor bouldering on artificial climbing walls consists of a worthwhile physical education activity, as children can perform ad hoc a versatile number of low-height tasks under safe conditions and without specific equipment. The purpose of the study was to investigate how non-experienced high school students perceive various short-term bouldering regimen.

285 students (15.3 ± 1 yrs., 163.7 ± 5 cm, 56.2 ± 4 kg) from 24 distinct high schools volunteered to participate in the study and were allocated in accordance with their personal preferences to (a) the self-coaching group (SC with $n = 93$), which consisted of a learning-by-doing approach without any coaching instructions, (b) the high-five group (HF with $n = 51$), in which participants were introduced through a structured training regimen with direct coaching guidelines to five fundamental bouldering skills, and (c) the cognitive approach group (CA with $n = 141$) performed on a small-sized bouldering wall. Each group was exposed to a four-week program with one bouldering session per week of 60 minutes in duration. Data collection was implemented using a 26-item questionnaire with a 5-factor data structure, including the categories (a) popularity of bouldering (POP), (b) activation (ACT) and (c) motivation (MOT) during the regimen, and (d) bouldering ability (BAL) and (e) technical skills (TSL) improvements.

Participants described indoor bouldering, regardless of the study group they were allocated to, as an enjoyable (94.8% ; $p < 0.001$), exciting (92.6% ; $p < 0.001$), and motivating (84.5% ; $p < 0.001$) physical activity and reported following the four-week regimen significant improvements of the bouldering ability (90.5% ; $p < 0.001$) and technical

skills levels (84.2%; $p < 0.001$). More specifically, MANOVA revealed significantly lower results in SC than HF and CA for the factor POP (SC: 1.9 ± 0.5 , $p < 0.001$; HF: 2.8 ± 0.4 , $p = 0.289$; CA: 2.7 ± 0.5 , $p < 0.001$), ACT (SC: 1.8 ± 0.8 , $p < 0.001$; HF: 2.4 ± 0.6 , $p = 1.00$; CA: 2.2 ± 0.7 , $p < 0.001$), MOT (SC: 1.9 ± 0.9 , $p < 0.001$; HF: 2.7 ± 0.6 , $p = 0.725$; CA: 2.6 ± 0.5 , $p < 0.001$), BAL (SC: 2.1 ± 0.7 , $p < 0.001$; HF: 2.6 ± 0.5 , $p = 1.00$; CA: 2.5 ± 0.6 , $p < 0.001$), and TSL (SC: 1.8 ± 0.9 , $p < 0.001$; HF: 2.8 ± 0.4 , $p = 0.001$; CA: 2.3 ± 0.7 , $p < 0.001$).

Our results emphasize that holistic training approaches with versatile movement demands are effective to introduce indoor bouldering to novice high school students. Since the acquisition of fundamental sport-specific movement skills is pivotal to guarantee long-term progressions, introducing novice athletes and non-experienced students to indoor bouldering by using a task-oriented, guided, and structured training approach seems to be beneficial to foster motor learning processes. Furthermore, our results highlight the potential of cognitive training approaches performed on small-sized bouldering walls.

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Lessons from COVID-19: Faculty and Students Experiences during Emergency Remote Education

The COVID-19 pandemic has unsettled higher education. Faculty and students needed to make abrupt and significant changes when the pandemic began, adjusting to remote learning environments. The pedagogical and technological challenges remain as the pandemic continues into 2021. The purpose of this mixed method research study is to identify the experiences of faculty and students as they shifted to emergency remote education, focusing on access to technology, access to a suitable learning environment and motivation to teach and learn.

A random selection within a convenience sample was obtained through recruitment via the authors' professional organizations in the United States. One hundred two participants include full-time and adjunct faculty, undergrad and graduate students. A convergent mixed method survey, developed by the authors, queried about participants' demographics; frequency of access to technology and a suitable learning/teaching environment; and reflection on motivation to learn and teach in the remote environment during the pandemic.

Students and faculty reported that, on average, their remote education experience was good. Analysis of Variance indicated that faculty and students who had prior experience with online education reported better remote educational experience during the pandemic ($M = 1.64 < M = 2.11$; $F(1) = 4.221$, $p = 0.045$).

On average, students reported regular access to technology. However, a linear regression analysis indicated that this did not emerge as a significant predictor of the overall remote learning experience. A preliminary constant comparative analysis suggested students who could afford their own devices experienced little difficulties accessing suitable technology, save for intermittent issues with Wi-Fi availability. But many students cited poor access to technology because they could not afford the appropriate devices.

On average, students reported having regular access to a suitable learning environment. While this emerged as a significant predictor of

overall remote learning experience ($F(1.51) = 7.357, p = 0.009$), it explained only 10% of the overall remote learning experience.

Environmental conditions emerged as a major theme. Students liked studying in their own space (on or off campus) as long as there were no interruptions, and they had reliable Wi-Fi. Both faculty and students reported experiencing safety and efficiency in the remote environment (avoiding exposure to the virus and saving time by not commuting). Student-faculty relationship emerged as a common theme. Faculty reported motivation to teach because they wanted to help their students. Students reported that faculty support helped their motivation to learn. Faculty reported more challenges with technology than students did and this emerged as a major interference with motivation to teach.

These results have implications that may be relevant as the world of education evolves, applying lessons learned during the pandemic. Post-secondary educational institutions should consider resource reallocation to meet emerging needs: Providing students with devices and infrastructure to reduce disparity in remote learning; modifying the plant structure to provide individual study areas (e.g., personal cubicles in libraries) instead of larger classrooms; providing faculty with remote education pedagogy training. Finally, inter-personal relationships remain important in the remote environment. Remote education should continue to involve meaningful interaction between faculty and students.

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**US Public School Principal Job Satisfaction:
A Comparison by Religion and Gender, School Location,
School Level**

This study examines United States public school principals' job satisfaction by region and the context factors of principals' gender, school level and school location. This study identifies significant context factors that make a difference to principal job satisfaction for all public schools in the United States. This is the first comprehensive research of US public school principals' job satisfaction by region and by region with specific independent variables tied to contextual relevance. Findings have implications for principal retention, professional development action plans for principals, school continuous improvement plans and higher education preparation for aspiring principals. Fundamentally, this study calls for educational leadership stakeholders to include principals' job satisfaction as an essential element of such systemic foci.

Educational research clearly posits principals support student achievement and teacher effectiveness; this study's exploration is timely, relevant, and necessary. A sample of US public school principals is from the 2015-16 National Teachers and Principals Survey (NTPS) principal data collected by the National Center for Education Statistics (NCES). This study applies one-way ANOVA to compare principal job satisfaction between the four regions and then applies two-way ANOVA to further compare principal job satisfaction by region and one of the three context factors (gender, school level, school location).

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An Interactive Decision Support System for College Degree Planning

Many students in the United States enter college without having decided on a focus for their studies, and thus are faced with choosing from a large number of potential majors and their associated very complex sets of degree requirements which can include courses in other areas of study. While students outside the US often have much less flexibility in choice and sequencing of courses, many countries are now changing policy in this regard and moving toward greater flexibility in course selection. Many universities employ direct communications between academic advisors and students as the primary advising system. Academic advisors use academic planning tools to help students make decisions about class schedules, selecting an academic major or minor, planning for graduation, and many other academic related activities. There is a dearth of decision support systems for degree planning, mainly due to the complexity of degree requirements, and thus many existing academic planning tools utilize static documents or PDF files for displaying information pertaining to degree requirements and course prerequisites. This work focuses on the complexity of degree requirements and presents the design and implementation of an efficient web-based decision support system that helps students explore degree completion paths through complex degree requirements.

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Online Surveillance and Education for Digital Competence

Digital competence has become increasingly important in modern societies. The possession of such competence is consequential to the ability to participate on equal terms as a citizen in a contemporary democracy. Hence, it is nowadays stressed as an important learning objective, more or less globally. For example, it is one of the eight key competences for lifelong learning identified by The European Parliament and The Council of the European Union (“Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning”, OJ L 394, 20.12.2006, 10-18).

Navigating in a digital world requires competences such as the ability to find relevant information through search engines and databases, but also to practice criticism of the sources. These competences receive increasing attention in schools. However, digitalization comes with downsides, one of them, arguably, being the facilitation of intrusive online surveillance. When we are online, we leave traces that provide useful information to companies and organizations, who can harvest our data for different purposes.

While knowledge of this fact has become more widespread, it does not seem to get the attention that it arguably deserves in schools and teacher education. In Swedish teacher education, where we operate, privacy issues in relation to online activities have not found a pronounced place in the curriculum. Having knowledge of these issues is important to be able to make deliberate choices regarding one’s online activities – what information do I want to share, and with whom? For instance, is it worth giving away some of my personal information to get access to a certain social media platform?

To be able to answer such questions autonomously and critically in a way that also influences one’s behavior, it is furthermore important to understand how people generally behave in relation to privacy and sharing information online. Quite extensive research has shown that people tend to behave in ways that do not mirror their own privacy concerns. While they report strong concern for their privacy, they behave online as if their privacy were not very important to them at all. This has become known as the “privacy paradox” (for an overview, see

N. Gerber, P. Gerber & M. Volkamer, "Explaining the privacy paradox: A systematic review of literature investigating privacy attitude and behavior", *Computers & Security* 77, 2018, 226-261).

Within the framework of the research project "iAccept: Soft surveillance - between acceptance and resistance", in which one of us participates, a questionnaire survey was conducted with 560 current and former Swedish student teachers, about their attitudes to privacy and surveillance and their online behavior. At large, their responses are in line with the privacy paradox. Partly based on this survey, we point to the importance of raising awareness of privacy issues in teacher education and schools. We argue that - like other aspects of digital competence - this aspect is also crucial to being a conscious citizen in a democratic society. Thus, it should constitute a natural part of education for digital competence.

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Growth and Pain in Life Story Reflection of Students in Higher Education

The importance of reflective pedagogy is widely acknowledged in HE and is a cornerstone in the curricula of the helping professions – occupations that provide health and education services to individuals and groups, including in the fields of psychology, counseling, social work, teaching, and education. The literature emphasizes the virtues of reflection in developing students' self-awareness and reflective skills, and in enhancing their personal and professional growth. However, scant attention has been paid to the emotional difficulties and pain that the students experience in the process. This is particularly puzzling regarding autobiographical reflection, that focuses on the students' identity and encourages them to examine extensive parts of their lives, which is increasingly exercised in HE. Emphasizing the students' growth in autobiographical reflection while insufficiently addressing the emotional pain entailed, creates a partial understanding of the nature of this pedagogy. Moreover, it may obscure the need to attend to the students' pain throughout, possibly leaving some of them in emotional distress.

To contribute to filling this lacuna, we examined 103 students of social work and educational counseling who underwent a systematic three-stage process of *Life Story Reflection* (LSR) – a type of autobiographical reflection whereby students *tell* their life stories, *analyze* them, and *explain* them (Spector-Mersel, 2017). Content analysis of the students' written reflections upon completing the LSR and of interviews conducted a year later with a smaller sample, revealed three main themes: First, a strong sense of personal and professional growth throughout the LSR and resulting from it; second, emotional difficulties and pain experienced throughout the LSR; and third, growth and pain as intertwined components of the LSR, where feeling pain is perceived as necessary to develop personal and professional identity and skills. We will demonstrate these themes and discuss their implications for the understanding of students' autobiographical reflection. Lastly, we will offer practical recommendations for implementing autobiographical reflection pedagogies in HE, to encourage the students' growth within a

safe and supportive environment, that pays attention to their emotional difficulties throughout.

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Didactic Connection between Spreadsheet and Programming Teaching

When we talk about problem-solving skills, then generally, programming comes into our minds as an activity that can develop algorithmic thinking and abstraction skill. Regarding the spreadsheet, the software application area could be our first, and mathematics could be our second thought. When spreadsheets and programming are mentioned together, then programming of macros is in focus, which is rather programming.

In this paper, we want to focus on how these two areas impact each other, and we want to emphasize that spreadsheet is an efficient tool to develop algorithmic thinking. Moreover, there is more “crosstalk” between these two tools.

The spreadsheet requires a function-like way of thinking (introduction to functional programming), but its classical functions (sum, maximum, etc.) are essential algorithm schemas (programming theorems) as well. Some functions can be understood if we imagine the algorithm of their execution (for example, VLOOKUP). Parametrizing functions and nested functions can support the understanding of parametrizing and parameter passing in conventional programming languages.

Spreadsheet is a proper tool to introduce the concept of scalar, array, matrix, and indexing, which are essential data structures of programming. The introduction of base data types is also supported by this tool. In case of advanced spreadsheet, array formulas can map all the schema-algorithms (programming theorems), and there can be a connection among array formulas and post-conditions of programming theorems.

This paper will show through examples that there is a two-way connection between spreadsheet and programming; that is why it can be useful to build the concepts of these two topics mutually on each other.

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Case Study of a Constructivist Framework for Professional Learning Communities

Educational organizations worldwide face challenges in selecting professional development models that meet the diverse and evolving needs of educators and students. Professional Learning Communities offer a means by which to address these needs. The problem addressed by this qualitative case study was the lack of a successful framework implementation and a shortage of time reserved for thorough implementation of professional learning at public and private schools alike. Through the lens of the experienced middle and high school educators at a school in the northeastern United States with a mature professional learning community, an effective framework is explored with theoretical constructivist underpinnings. Guided by the constructivist and constructionist theories of learning of Dewey, Piaget, and Vygotsky, along with the Senge's learning organizations theory and Fullan's practice theory perspective, the research questions focused on the teachers' perceptions of the PLC effectiveness and the extent to which the PLC practices aligned with the conceptual framework of PLCs as proposed by Hord. Data for this case study were collected using three methods for triangulation: a professionally developed questionnaire administered to full-time teachers who had been with the school for at least two years, individual teacher interviews, and professional learning community meeting observations. Data originated in the questionnaire, followed by coding of meetings and interviews using NVivo software to identify themes and patterns. This study revealed that teachers perceived this model as highly supportive for organizational change, offering a feedback loop, strategic sharing and job-embedded teacher development with a mentoring component included. This case study brings successful processes and procedures to the forefront for developing, implementing, and sustaining effective professional learning communities in schools.

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The Objectives of the Organization for Economic Co-Operation and Development (OECD) in Correlation with the Objectives of the Brazilian, Russian, Indian and South African Organization (BRICS)

Development (OECD) is to find solutions for socio-economic and educational problems in the member states. Monitoring economic trends in terms of trade, technological development, taxation and agricultural development is also part of the objectives of the OEDC. The OEDC focuses especially on the socio-economic development within the member countries. The OECD Education and Skills Development Directorate prioritises the development of education, training and skills development to ensure better employment opportunities for the population and to combat poverty. The member states are encouraged to identify and implement best practices within the respective education systems, and to set and implement achievable goals. The OECD emphasizes the fact that effective education is the way to prosperity in each country. The OECD aims to ensure the optimal effectiveness of education by providing support programs for parents, learners, teachers and policymakers. The presence of economic, social and environmental challenges has been identified by the OECD and is therefore provided for especially by policymakers to address these challenges. Young learners entering the education system in 2018 will be young adults in 2030 and the OECD aims to ensure that schools equip these learners to enter the labour market successfully. In order to successfully achieve the latter ideal, schools in the teaching and learning process must ensure that learners are equipped with curiosity, imagination, resilience and self-regulation. They will need to respect and appreciate the ideas, perspectives and values of others, and they will need to cope with failure and rejection, and to move forward in the face of adversity. Learners' motivation should not be only to get a good job and have a decent income, but they will also have to look after the well-being of their friends and families, their communities and the planet. The OECD has launched The Future of Education and Skills 2030 project. The aim of the project is to help countries find best

practices in order to successfully measure the above ideals within the respective education systems:

- What knowledge, skills, attitudes and values will today's students need to thrive and shape their world?
- How can instructional systems develop these knowledge, skills, attitudes and values effectively?

The above mentioned aims of the OECD correlate with the main objectives of the BRICS organization (Brazil, Russia, India, China and South Africa - organization). The main focus of BRICS is also to develop the socio-economic status of the member states through an effective education system.

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Enhancing Adolescents' Self-Directed Reading of Controversial Youth Literature

Reading is a vital skill in being able to function as a member of a national and international society. However, the reading ability of learners in many nations still remains problematic. In South Africa this problem features more prominently when our country's poor performance in the Annual National Assessment (ANA), Progress in International Reading Literacy (PIRLS) and Programme for International Student Assessment (PISA)-assessments is taken into account. This reading problem accelerates when adolescents are confronted with youth literature with controversial content. The average adolescent reader will probably find these contentious youth novels unsettling and, therefore, the message of hope may fade away. Owing to these controversial matters in youth literature, the stories are sometimes either severely criticised by certain role-players, who regard themselves as the moral gatekeepers of the youth, or these stories enjoy the support of others who believe that the occurrence of controversial matters in youth literature provides an opportunity to conduct an intellectual conversation with the adolescent reader. Language teachers who shy away from these contentious topics in youth literature and who do not want to address these matters in the classroom with their learners, or would rather not have these controversial youth novels prescribed for their learners, no longer provide a solution to this problem. The question should rather be what effective methods can be used to facilitate these controversial matters with the learners in the classroom to finally enhance adolescents' self-directed reading. The reception aesthetics of Wolfgang Iser (1978), the angst and catharsis theories, the development of reading strategies and skills to develop the literary abilities of adolescent readers, as well as the role of the language teacher as mediator and pastor will be discussed as possible solutions to facilitate controversial youth literature with adolescent readers in an effort to get these learners self-directed readers. A self-directed reader should be able to read independently in order to meet the demands of the society creatively, critically and in a problem-solving manner.

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Examining Early Career Teachers' Formative Practices to Inform and Support Continuous Improvement in Educator Preparation Programs

Formative assessment is the process by which teachers continually collect evidence of student understanding and skill and provide students with specific and relevant feedback necessary to move forward and be more successful in their learning (Black & William, 1998; Heritage, 2007; Moss & Brookhart, 2019). These essential, in-process evaluation practices assist teachers in collecting relevant student data that can be used to improve their instruction to more effectively target students' needs. Research demonstrates that pre-service teachers gain a wide range of understanding of how to implement formative assessment practices during their time in clinical practice and coursework during licensure programs (Cowan, 2007; DeLuca, 2010). To increase the effectiveness of education preparation programs (EPP), EPPs must evaluate the efficacy of their teacher preparation programs, which includes evaluating their teacher candidates' ability to transition from pre to in-service teachers and implement effective pedagogical practices aimed to promote student success.

This paper presents methods, findings, and implications from a year-long, multi-case study research project that followed a small group of completers from our EPP into their classrooms to observe their first year as licensed teachers in public schools in the United States. We used multiple sources of data and analysis to investigate two research questions, *How do early career teachers' assessment practices impact student learning?* and *How do the findings from this study guide us as teacher educators to provide a more effective teacher preparation program for our teacher candidates so their K-12 students have greater success?* Study participants were representative of three different licensure pathways in our EPP and were employed to teach in three different school districts. The purpose of our study was to explore the extent to which this group used formative assessments in their classrooms to positively

impact student learning and examine strengths and areas for improvement in our EPP.

Based on analysis from multiple measures, evidence shows that our EPP is mostly effective in preparing beginning teachers specifically related to their use of formative assessments and their ability to impact student learning. For example, based on the results of pre and post formative assessments in some of the teachers' classrooms, a majority of students showed positive growth. According to survey results and interviews, no areas evaluated indicate 'poor' preparation by our EPP. However, implications from data support recommendations for EPP continuous improvement that include more intentional practices embedded in our EPP related to designing curriculum, instruction, assessments, use of data, and student supports. This study highlights the importance of completing self-studies to determine strengths of an EPP as well as areas for improvement so EPPs, teachers, and K-12 students have greater success. Through these findings and additional information gathered throughout the study, we encourage teacher educators to critically evaluate and continuously improve their courses, and EPPs so novice educators have opportunities to observe, learn, and practice formative assessment methods that enable them to be more effective in-service educators.