Preface to the ICICTE 2024 Proceedings: Shaping the Future of Learning and Advocacy

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Welcome to the proceedings of ICICTE 2024, a platform that brings together researchers, educators, and industry experts from around the world to share insights and innovations shaping education, technology, and societal discourse. This collection of papers reflects a diverse and multidisciplinary approach to addressing the challenges and opportunities that arise in an era defined by rapid technological advances and complex global issues, presenting a rich exploration of innovative research and initiatives aimed at addressing contemporary educational challenges, enhancing learning experiences, and fostering sustainable, inclusive, and informed societies. From immersive learning technologies revolutionizing astronomy education to AI-driven personalization in higher education, and from strategies for combating fake news to integrating sustainability in media curricula, these contributions highlight the dynamic intersections of education, technology, and societal well-being.

Complementing this year's visionary keynote presentation by Eleni Chatzichristou, which sets the stage by demonstrating how interactive, experiential learning can deepen comprehension and engagement in scientific education, the presented research papers explore critical themes such as the reflections of school leaders on digital adaptation during the pandemic, innovative teaching methodologies, AI integration in personalized learning, the integration of sustainability goals into media education, and efforts to foster digital literacy and combat misinformation. Together, these contributions offer a comprehensive view of how technology, policy, and pedagogy intersect to shape the future of learning and advocacy through research-driven innovation and collaboration.

Several overarching themes emerge—chief among them, the necessity of adaptability, collaboration, and critical thinking in addressing the evolving challenges of the 21st century, underscoring the transformative power of technology in education while also highlighting the ethical, social, and professional considerations that accompany its use. The studies, each summarized in one sentence below emphasize the profound impact that thoughtful educational design and policy can have on shaping informed, resilient, and responsible citizens.

Keynote: Eleni Chatzichristou, *Astronomy Education through Immersive Learning and Enacted Astronomy*. This keynote presentation explores how immersive learning technologies and enacted astronomy, through interactive

simulations, role-playing, and experiential engagement, are revolutionizing astronomy education by enhancing comprehension, retention, and student engagement with complex astronomical concepts.

Marcia Håkansson Lindqvist, *Exploring School Leaders' Lessons Learned During the Pandemic: Reflections in Retrospect.* This paper analyzes school leaders' reflections on the lessons they learned from using digital technologies during the pandemic, highlighting the increased efficiency of digital meetings, enhanced accessibility for students and parents, and the need for ongoing professional development in digital competence.

Maria Concetta Carruba, Alessandro Barca, & Mariella Tripaldi, *Methodologies and New Technologies: A Winning Combination for 21st Century Skills?* This exploratory study investigates the impact of active teaching methodologies and new technologies, such as ICTs and Artificial Intelligence, on primary and secondary school teachers' ability to foster life and soft skills in students, highlighting the importance of teacher training in effectively integrating digital tools into educational practices.

Georgios Karavasilis, *Evaluation of eLearning Platforms for Enhancing Digital Competencies of Vocational Education and Training (VET) Educators: A Comparative Study.* This study evaluates eLearning platforms for vocational education and training (VET) educators using a comprehensive rubric, identifying key strengths and weaknesses, offering recommendations for platform selection, and emphasizing the importance of digital competence development to enhance teaching effectiveness and learner outcomes.

Seyma Esin Erben & Hazal Koray Alay, *Women's Rights NGOs and Online Informational and Educational Content: A Comparative Analysis of the NGOs' Websites in Turkiye.* This paper (abstract only) examines and compares the online educational content of five women's rights NGOs in Türkiye, analyzing content types, accessibility, and organizational structure to assess their effectiveness in supporting advocacy and education within the context of fourth-wave feminism.

Antonis Gantzos, *Fake News Analysis: Predictive Capabilities and Implementation on the Web with Neural Networks.* The document describes the development and evaluation of machine learning models, primarily linear and non-linear neural networks, for fake news detection, integrating the best-performing model into a web application for real-time predictions.

Yianni Varonis, *News Digression and Political Polarization in the United States.* This article explores the historical evolution of political polarization in the United States, emphasizing how biased news media, social media algorithms, and

misinformation have intensified divisions while highlighting media literacy as a potential solution to mitigate its effects on democratic governance.

Aránzazu García-Martínez, Víctor Gómez-Muñiz, Elisa Serrano-Ausejo, & Peter Mozelius, *A Proposal for an Immersive Virtual Reality Competencies Framework for History Teachers: Towards a Specialization of TPACK*. This paper proposes a specialized framework for integrating immersive virtual reality (iVR) into history education, building on the TPACK model and the European Digital Competences Framework to guide history teachers in developing the competencies required for effective use of iVR in teaching, emphasizing a gradual learning process from basic visualization to advanced content creation.

Konstantinos Karampelas, Anastasia Pyrini, George Sarrigeorgiou, Laura Screpanti, Benedetta Castagna, David Scaradozzi, & Ana Sović Kržić, *ROBOAQUARIA: Robots in Aquatic Environments to Promote STEAM and Environmental Awareness*. This paper explores the ROBOAQUARIA project, which integrates robotics into marine environmental education to promote STEAM learning and environmental awareness, showing that such interdisciplinary approaches can lead to significant cognitive, skill-based, and attitudinal outcomes for students, while also positively impacting school practices and teacher competencies.

Konstantinos Karampelas, Anastasia Pyrini, George Sarrigeorgiou, Konstantinos Tsolakidis, Emmanuel Rollinde, Malte Ubben, Maximilian Alexander Loch, & Nicoletta Pantela, *Aristarchus—Artistic Reality in School Education: Enacted, Reflective, and Collaborative Learning with the Human Orrery Space.* This study evaluates the effectiveness of using a human orrery in astronomy education through the ARISTARCHUS project, demonstrating how hands-on, interactive learning fosters deeper understanding, mental modeling, and positive attitudes toward science, while also examining the potential for transforming teaching practices across different educational systems.

Orestes Varonis, Evangeline Varonis, George Sarrigeorgiou, Anastasia Pyrini, & Darya Yegorina, *Empowering Sustainable Education: Reflections from the MIRACLE Pilot Initiatives.* The study evaluates the impact of climate change education impact on students and teachers across five countries; statistical analysis possible on Spanish students demonstrates significant improvements in knowledge and behaviour while attitudes, since initially high, show smaller gains, highlighting the effectiveness of targeted educational strategies incorporating augmented reality and comic creation for climate awareness.

Ġorġ Mallia & Monika Maslowska, *Sustainability in Media Education: Collaborative Strategies for Curriculum Development and Professional Empowerment by the SUMED Project.* The paper discusses the SUMED project,

which involves collaborative efforts among five institutions across Europe to integrate sustainability goals into media education and the media industry, focusing on curriculum redesign and professional empowerment to equip students with sustainable media practices for future industry roles.

Apostolos Kostas, Dimitris Spanos, Filippos Tzortzoglou, & Alivisos Sofos, *Leveraging AI for Personalized Instruction in Higher Education: Initial Findings from the LEADER AI Project.* This paper presents preliminary findings from the LEADER AI project, which investigates the integration of AI-based and data-driven tools for personalized instruction in higher education, revealing both the opportunities and challenges associated with their adoption.

Aleksander Aristovnik, Lan Umek, & Dejan Ravšelj, *The Perceptions of Slovenian Higher Education Students on ChatGPT: A Comparison with Global Trends.* This paper examines the perceptions of Slovenian higher education students regarding ChatGPT and compares them to global trends, highlighting differences in usage patterns, ethical concerns, and support for regulation, with Slovenian students favoring academic writing applications but expressing stronger ethical concerns and less support for regulation compared to their international peers.

Apostolos Kostas & Christos Chanis, *ChatGPT and AI in K-12 Education: Views and Practices of Greek Teachers.* The study examines Greek teachers' perceptions of ChatGPT in education, highlighting its potential to enhance personalized learning while also identifying significant challenges such as data privacy concerns, algorithmic bias, and the need for better teacher training and policy frameworks for ethical AI use in education.

Mariano Sanz-Prieto, Elena López-de-Arana, Gema de-Pablo-González, *Newspiracy—Training Teachers in Post Truth Recognition.* The paper discusses the Newspiracy project, an educational initiative designed to equip teachers with tools and training to help students recognize and combat fake news and post-truth narratives, emphasizing the importance of critical thinking and media literacy in preserving democratic values.

The diverse research presented in these conference proceedings reflects a collective commitment to leveraging technology, innovative teaching methodologies, and data-driven insights to improve educational practices and societal outcomes, illustrating the dynamic interplay between technological advancements and human-centered learning. The papers also emphasize the need for inclusive and accessible approaches, whether in vocational training, women's rights advocacy, or environmental education. By synthesizing these findings, this body of work

provides a foundation for future collaboration, policy development, and continued exploration of how digital tools can be harnessed for transformative impact in education and beyond.

We extend our deepest gratitude to all contributors, reviewers, and organizers who made this event possible. It is our hope that these proceedings will inspire continued exploration, dialogue, and innovation as we collectively navigate the complexities of modern education and society. Let this be a call to action for educators, policymakers, and researchers alike to foster an inclusive, ethical, and forward-thinking educational landscape.