

STE2022

3RD INTERNATIONAL CONFERENCE
ON SCIENCE AND TECHNOLOGY EDUCATION

6-7 October 2022
FEUP, Porto - Portugal



TOPICS OF INTEREST

- . science and technology epistemologies
- . science and technology learning mechanisms
- . science and technology learning systems
- . science and technology diversity and inclusiveness
- . science and technology assessment

PROGRAMME OF STE2022

Author underlined → presenting author

Thursday 6 October 2022	
8:30	STE2022 Opening (Room A101 (Auditorium))
Session 1 – Learning mechanisms I (Chair: LFM da Silva and AM Ferreira)	
Room A101 (Auditorium)	
8:40	Engineering and didactics: Blended approach for designing and studying STEM learning in digital age (STE22_54) <u>M Tchoshanov</u> (University of Texas at El Paso, USA)
9:00	"I'm not your science teacher": Perspectives on a dedicated STEM elementary school initiative (STE22_38) <u>FP Nelson</u> (California State University, USA), R Yerrick, F Arciniega
9:20	Active learning and visualisation of electric current in the lower secondary school science teaching (STE22_29) <u>D Rihtaršič</u> (University of Ljubljana, Slovenia), M Lavrič, K Susman
9:40	Investigating pre-service preschool teachers' self-directed learning in distance and traditional design and technology education (STE22_14) <u>B Kurent</u> (University of Ljubljana, Slovenia), S Avsec
10:00	Circulation concepts graphically represented in a game-like manner to support a project process in architecture (STE22_31) <u>ER Victorio</u> (University of Campinas, SP, Brazil), DCCK Kowaltowski
10:20	Bonder - A didactic tool for consolidating knowledge on adhesive bonding technology (STE22_27) <u>AQ Barbosa</u> (INEGI, Portugal), A Duarte, C Leite, D Barbieri, L Barts, CSP Borges, LFM da Silva
10:40-11:00 COFFEE BREAK (Room under the Auditorium)	
Session 2 – Learning mechanisms II (Chair: AZ Sampaio and FP Nelson)	
Room A101 (Auditorium)	
11:00	Using competitions as a teaching technique for cyber security education: The case of the National Cyber League (NCL) (STE22_2) <u>C Toregas</u> (The George Washington University, USA), D Manson, S Miller
11:20	Enhancing the efficacy of identifying visual patterns and novel anomalies of cyber-defenders with 3D immersive VR (3DIVR) (STE22_12) <u>D Passig</u> (Bar-Ilan University, Israel), R Hochman
11:40	3D with artificial intelligence technology contributes science and technology education development (STE22_22) <u>H Jiang</u> (H Cruiser Research Group, Germany), XL Liu, MX Tang
12:00	Teaching ergodicity of WSS random processes using MATLAB (STE22_15) <u>GJ Dolecek</u> (National Institute INAOE, Mexico)
12:20	The blockchain technology applications in higher education (STE22_49) B Vasconcelos, <u>JL Reis</u> (University of Maia, Portugal), AV Sousa, JLM Santos
13:00-14:00 LUNCH BREAK (Room under the Auditorium)	
Session 3 – Learning mechanisms III (Chair: C Toregas and WWM So)	
Room A101 (Auditorium)	
14:00	The agile science: Lessons from physics and physicists (STE22_5) <u>G Yair</u> (The Hebrew University of Jerusalem, Israel)
14:20	Influence of COVID-19 confinement and pandemic on the academic performance of students (STE22_20) I Tort-Ausina, J Molina-Mateo, A Vidaurre, <u>JM Meseguer-Dueñas</u> (Universitat Politècnica de València, Spain), J Riera, JA Gómez-Tejedor, M-A Serrano, S Quiles
14:40	On the design of a curriculum unit focused on the smart factory concept (STE22_33) <u>A Azevedo</u> (University of Porto, Portugal), A Almeida

15:00	Undergraduate engineering laboratories: A study exploring laboratory objectives and student experiences at an Irish University (STE22_4) <u>T O'Mahony</u> (Munster Technological University, Ireland), M Hill, A Duffy	
15:20	Introduction of BIM methodology in structural engineering education (STE22_24) <u>AZ Sampaio</u> (University of Lisbon, Portugal), TT Farinha, AM Gomes	
15:40	How to improve students' satisfaction and engagement in large classes? – a successful example of an innovative pedagogical approach which combined spaced learning and team-based learning (STE22_48) L Gonçalves, B Matos, M Rodrigues, F Ribeiro, V Carlos, <u>M Fardilha</u> (University of Aveiro, Portugal)	
16:00-16:20	COFFEE BREAK (Room under the Auditorium)	
	Session 4 – Innovative pedagogical projects of DEMec/LEM-MEM (Chair: LFM da Silva and J Seabra)	
	Room A101 (Auditorium)	
16:20	The class as a theatrical play (STE22_7) EAS Marques, RJC Carbas, PP Camanho, <u>LFM da Silva</u> (University of Porto, Portugal)	
16:35	"O docente tutor": A pilot project (STE22_42) <u>AM Lopes</u> (University of Porto, Portugal), TMGP Duarte, RJC Carbas, EAS Marques, PJSM Coelho	
16:50	Interactive lab on advanced joining processes (STE22_8) <u>EAS Marques</u> (INEGI, Portugal), RJC Carbas, LFM da Silva	
17:05	Virtual tool to support the teaching of technical drawing (STE22_9) <u>RJC Carbas</u> (INEGI, Portugal), EAS Marques, JAS Almacinha, JJM Machado, LFM da Silva	
17:20	Virtual platform to improve teaching and studying of materials science and engineering (STE22_18) <u>CSP Borges</u> (INEGI, Portugal), F Castro Sousa, TMGP Duarte, RJC Carbas, LFM da Silva	
17:35	Autonomous experimental practice with photovoltaic systems (STE22_37) <u>Al Palmero-Marrero</u> (University of Porto, Portugal), AC Oliveira, J Mendes	
17:50	Force characterization using electromagnetic elements (STE22_46) <u>AR Silva</u> (University of Porto, Portugal), F Vasques, AM Lopes	
18:05	FabLab – An integrative pedagogical experience (STE22_61) D Pinheiro, G Wiechert, J Alegre, V Rodrigues, D Carvalho, J Almacinha, J Marafona, M Parente, <u>A de Jesus</u> (University of Porto, Portugal), JMRS Tavares	
19:00	Poster session and RECEPTION	
	Learning mechanisms	
Poster 1	Technologies and education: Some remarks from a "stimulus-means" perspective (STE22_13)	<u>S Morganti, V Zudini</u> (University of Trieste, Italy)
Poster 2	Academic short course: The BIM methodology in construction, structures and heritage buildings (STE22_25)	<u>AZ Sampaio</u> (University of Lisbon, Portugal), AM Gomes
Poster 3	From STEM to STEAM with educational robotics (STE22_36)	<u>PK Kočková</u> (University of Ostrava, Czech Republic), KK Kiliánová, KK Kostolányová
Poster 4	Exploring hybrid approaches in Engineering Thermodynamics during Covid-19 pandemic (STE22_53)	<u>N Muñoz-Rujas</u> (Universidad de Burgos, Spain), G Rubio-Pérez, R Briones-Llorente, M Lifi, F Aguilar, EA Montero
Poster 5	How can phenomenon-based learning be implemented in the context of a primary school? (STE22_59)	<u>S Rantanen</u> (University of Turku, Finland), M Veermans
Poster 6	Sensors embedded in mobile devices, gamification and interfacing of sensors and their use in STEM education (STE22_60)	<u>P Boháčková</u> (University of Ostrava, Czech Republic), KL Klubal, PK Kočková, KK Kostolányová
	Learning systems	
Poster 7	Update and reformulation of the European Adhesive Bonder Curricula using a modular and learning outcomes approach (STE22_55)	<u>E Meiß, AO Barbosa</u> (INEGI, Portugal), A Almeida, T Avelino, F Mañas, M Uran, M Tonnhofer, LFM da Silva
Poster 8	Research and education systems of European universities concerned with laser welding and friction stir welding (STE22_21)	<u>R Beygi</u> (INEGI, Portugal), A Akhavan-Safar, EAS Marques, LFM da Silva
	Assessment	
Poster 9	Some factors influencing students' academic performance in the Integrated Master in Mechanical Engineering (MIEM) at FEUP (STE22_43)	<u>TMGP Duarte</u> (University of Porto, Portugal), AM Lopes, LFM da Silva

Friday 7 October 2022**Session 5 – Learning mechanisms IV** (Chair: RD Adams and GJ Dolecek)**Room A101 (Auditorium)**

- 9:00 Enhancing engineer and engineering perception through video design in STEM education (**STE22_52**)
N Muñoz-Rujas (Universidad de Burgos, Burgos, Spain), A Pavani, J Baptiste, FEM Alaoui, E Montero
- 9:20 Strategies to provide future engineers with a global view of building performance (**STE22_40**)
NMM Ramos (University of Porto, Portugal), PF Pereira
- 9:40 Knowledge and behavior with COVID-19 among Hong Kong primary students (**STE22_41**)
WWM So (The Education University of Hong Kong, Hong Kong), WC Li, HM Lee, MS Man
- 10:00 Redesigning introductory computer programming in engineering education using innovative online modules (**STE22_47**)
D Persano Adorno (University of Palermo, Italy)
- 10:20 A take home laboratory to support teaching electronics: Instructors perspectives and technical revisions (**STE22_50**)
T O'Mahony (Munster Technological University, Ireland), M Murray, M Hill, R Onet, M Neag, L de la Torre Cubillo, D Zhou

10:40-11:00 **COFFEE BREAK (Room under the Auditorium)****Session 6 – Learning systems** (Chair: S Avsec and AM Lopes)**Room A101 (Auditorium)**

- 11:00 Educating Engineers (**STE22_45**)
RD Adams (University of Bristol, UK)
- 11:20 On the importance of discipline-culture paradigm of Science Education for Technology Education (**STE22_57**)
I Galili (The Hebrew University of Jerusalem, Israel)
- 11:40 Promoting in-service teachers' expertise in STEAM and teaching in digital learning environments (**STE22_23**)
M Veermans (University of Turku, Finland), S Rantanen, A Lahti
- 12:00 Adaptability and course complexity: An engineering department's response to external stimulus in terms of teaching practices and strategies (**STE22_30**)
G Panther (University of Nebraska-Lincoln, Nebraska, USA), HA Diefes-Dux
- 12:20 Identifying design thinking profiles in technology-enhanced collaborative learning and investigating their relation to interpersonal skills in prospective design and technology teachers (**STE22_28**)
S Avsec (University of Ljubljana, Slovenia)
- 12:40 Experimental and computational project: A new experience in the Bachelor of Mechanical Engineering at FEUP (**STE22_44**)
A Afonso, A Arteiro, C Fernandes, MPL Parente (University of Porto, Portugal), AR Silva, P Sousa

13:00-14:00 **LUNCH BREAK (Room under the Auditorium)****Session 7 – Diversity and inclusiveness** (Chair: EAS Marques and CN Della)**Room A101 (Auditorium)**

- 14:00 Two theory driven approaches toward a single goal: Retaining students in STEM (**STE22_6**)
EM Dell (Rochester Institute of Technology, NY, USA), EM Weeden, J Christman, SP Mason, JA O'Neil
- 14:20 Information and communication technologies-mediated interventions to promote digital inclusion and healthy aging among older people in Costa Rica (**STE22_11**)
MD Castro-Rojas (Universidad Nacional, Costa Rica), M Coto-Chotto, M Blanco-Molina
- 14:40 Novice teachers' technology integration and professional identity reframing in the Chinese as an additional language classroom (**STE22_16**)
Y Gong (University of Macau, China)
- 15:00 Occupational identity work in engineering practice: Implications for engineering educators (**STE22_17**)
KD Beddoes (San Jose State University, CA, USA)
- 15:20 Young voices - Exploring preschool children's perspectives about natural environments through art (**STE22_10**)
Y Kesner Baruch (Levinsky College of Education, Israel)
- 15:40 Embedding technology in children's experiencing and learning of their urban nature environments. Educational uses of two citizen observatories in the context of an environmental education project (**STE22_56**)
M Daskolia, M Pappa, Z Daskalaki, A Trigatzi, M Pliota (National and Kapodistrian University of Athens, Greece), A Joly, P Bonnet, R Arias, K Soacha, J Piera

16:00-16:20 **COFFEE BREAK (Room under the Auditorium)**

Session 8 – Assessment (Chair: LFM da Silva and AM Ferreira)

Room A101 (Auditorium)

16:20	"But what should be the grade?" A conceptual study of achievement standards (STE22_3) <u>V Gynniid</u> (Norwegian University of Science and Technology, Norway)
16:40	Performance of active learners at the University of Glasgow Singapore: An empirical evidence (STE22_26) <u>CN Della</u> (University of Glasgow, UK), I Lim, C Goh, V Dale
17:00	A multi-dimensional quality assessment instrument for engineering education (STE22_34) L Bernold, <u>B Díaz</u> (North Carolina State University, USA)
17:20	An empirically-based systematic design for science assessment (STE22_39) <u>L Morell</u> (University of California, USA)
17:40	The use of Discord in a learning environment at university level (STE22_58) <u>R Soeiro</u> (University of Porto, Portugal), G David, AMA Neves
20:00	STE 2022 BANQUET (Porto Caves Calém)