

PROGRAMME AT A GLANCE

Monday July 2nd			
Time	Location: <i>Paraninfo Universidad de Zaragoza</i> (https://www.unizar.es/information-institution/name-and-address)		
09:00-15:00	Arriving at Zaragoza		
17:00-20:00	Registration		
18:30-19:30	Opening ceremony		
19:30-21:00	Welcome Reception		
Tuesday July 3rd			
Time	Location: Facultad de Educación (https://educacion.unizar.es/en)		
09:00-10:30	Key Note 1: <i>María Pilar Jiménez Aleixandre</i> How to gather and analyse quality evidence about successful biology classrooms		
10:30-11:00	Coffee Break		
11:00-12:15	Paper Session 1a Symposium 1	Paper Session 1b	Paper Session 1c
12:15-13:30	Paper Session 2a Symposium 2	Paper Session 2b	Paper Session 2c

13:30- 15:00	Lunch		
15:00- 16:30	Poster Session 1a	Poster Session 1b	Poster Session 1c
16:30- 17:00	Coffee Break		
17:00- 18:30	Paper Session 3a	Paper Session 3b	Paper Session 3c
18:40- 19:40	Early Career Researchers' meeting point *		

* An informal meeting for PhD students, postdoctoral or anyone who feels that they are an early career researcher, to exchange opinions and experiences about researching in Biology Education.

Wednesday July 4th			
Time	Location: Facultad de Educación (https://educacion.unizar.es/en)		
9:00-10:30	Paper Session 4a	Paper Session 4b	Paper Session 4c
10:30- 11:00	Coffee Break		
11:00- 12:15	Paper Session 5a Symposium	Paper Session 5b	
12:15- 13:30	Paper Session 6a	Paper Session 6b	Paper Session 6c
13.30:15:00	Lunch		
16:00- 20:00	Tours - social event		

Thursday July 5th

Time

Location: Facultad de Educación
(<https://educacion.unizar.es/en>)

9:00-10:00	Paper Session 7a	Paper Session 7b	Paper Session 7c	
10:00-11:30	Paper Session 8a	Paper Session 8b	Paper Session 8 c	
11:30-12:00	Coffee Break			
12:00-13:30	Poster Session 2a	Poster Session 2b	Poster Session 2c	
13:30-15:00	Lunch			
15:00-16:00	Business meeting			
16:00-16:30	Coffee Break			
16:30-17:30	Poster Session 3a	Poster Session 3b	Poster Session 3c	Poster Session 3d
17:30-18:30	Researchers' café *			
20:00-23:30	Conference Dinner			

* An open space where an individual or group of researchers can present projects or relevant information for the ERIBOD community. Please let the Academic Committee know in advance if you wish to present something.

Friday July 6th

Time

Location: Facultad de Educación

(<https://educacion.unizar.es/en>)

Round table about “Publishing in Biology Education Research”

9:00-9:45

Tom Ireland, Editor of *The Biologist* and Managing Editor of the *Journal of Biological Education* (Royal Society of Biology, UK), Kostas Kampourakis (University of Geneva, Switzerland) and Michael Reiss (University College London, UK) .

Key note 2: *Jesús Martínez de la Fuente*

9:45-10:45

Nanomedicine: New Challenges for Biotechnology

10:45-11:15

Coffee Break

11:15-12:15

Paper Session 9a

Paper Session 9b

Paper Session 9c

12:15-13:00

Closing ceremony

13:30-15:00

Lunch

DETAILED PROGRAMME

Monday July 2nd

Location: *Paraninfo Universidad de Zaragoza*

(<https://www.unizar.es/information-institution/name-and-address>)

- 17:00-20:00 Registration
- 18:30-19:30 Opening ceremony
- 19:30-21:00 Welcome Reception

Tuesday July 3rd

Location: Facultad de Educación . (<https://educacion.unizar.es/en>)

Key Note 1: *María Pilar Jiménez Aleixandre*

- 09:00-10:30 **How to gather and analyse quality evidence about successful biology classrooms**

Chair: Marcus Grace

Location: Conference hall (basement)

- 10:30-11:00 Coffee Break

Paper Session 1a - Symposium 1 (Strand: 1. Students' conceptions and conceptual change)

- 11:00-12:15 **Title: Genetic determinism and students' understanding of gene-trait relationships**

Chair: Michael Reiss

Location: 0.5(ground floor)

Title **Students' Conception of the Relationship between Genes and Traits Affects their Understanding of Genetic Mechanisms**

Authors *Michal Haskel-Ittah and Anat Yarden*

Title **The Formation of Traits: A Framework for Systematizing Students' Problems of Explanatory Coherence and for Analyzing Teaching Materials in Genetics Education**

Authors *Marcus Hammann and Tim Heemann*

Title **Investigating the Relationship Between Beliefs in Genetic Determinism as Related to Knowledge in Genetics and Genomics**

Authors *Niklas Gericke, Rebecca Carver, Jérémy Castéra, Neima Alice Menezes*

Evangelista, Claire Coiffard Marre and Charbel N. El-Hani

Title **Students' implicit associations between genetics concepts and essentialist/teleological intuitions**

Authors *Kostas Kampourakis, Florian Stern and Andreas Müller*

Paper Session 1b (Strand: 2. Students' interest and motivation)

11:00-12:15 *Chair: Alexander Eckes*

Location:0.6 (ground floor)

Title **Bringing together what belongs together: theory & practice and children & nature**

Authors *Lara Weiser and Annette Scheersoi*

Title **Collaborative care for animals in class – Effects on the students' relatedness and their flow experience in biology lessons**

Authors *Alexander Eckes, Nadine Großmann, Annette Textor and Matthias Wilde*

Title **Motivation of Newly Arrived Students in the Science Classroom – "If one wants to become a doctor he has to study Biology."**

Authors *Mario Schmiedebach and Claas Wegner*

Title **The motivation level of Soweto students towards learning biology**

Authors *Dudrah Moyo and Lindelani Mnguni*

Paper Session 1c (Strand: 5. Teaching strategies and teaching environments)

11:00-12:15 *Chair: Andri Christodoulou*

Location:0.7 (ground floor)

Title **Teaching & learning laboratories in biology teacher education: Analysis of students' reflections on teaching experiences**

Authors *Antje Saathoff and Corinna Hößle*

Title **Understanding immunobiological processes – Using everyday conceptions in group discussions**

Authors *Sonja Tinapp and Jörg Zabel*

Title **Learning to design biology lessons based on socio-scientific inquiry based learning (SSIBL)**

Authors *Andri Christodoulou, Ruth Amos, Christina Ottander and Katarina Ottander*

Title **Learning the Control-of-Variables Strategy: What works best?**

Authors *Johanna Kranz, Tobias Tempel, Katrin Kaufmann and Andrea Möller*

Paper Session 2a-Symposium 2 (Strand: 1. Students' conceptions and conceptual change)

12:15-13:30

Title: Understanding and Acceptance of Evolution in the Light of Threshold Concepts

Chair: Ute Harms

Location: 0.5(ground floor)

Title

Using cluster analysis for categorization of student explanations of natural selection

Authors *Andreas Göransson , Daniela Fiedler , & Lena Tibell*

Title

Knowledge of Randomness and Probability as Predictor for Understanding and Acceptance of Evolution

Authors *Ross Nehm, Daniela Fiedler, Gena Sbeglia, & Ute Harms*

Title

Simulation EvoSketch: Learning Randomness and Probability in Evolution

Authors *Daniela Fiedler & Ute Harms*

Title

Visualizing time in evolution

Authors *Jörgen Stenlund & Lena A. E. Tibell*

Paper Session 2b (Strand: 4. Scientific thinking, nature of science and argumentation)

12:15-13:30

Chair: Melanie Peffer

Location:0.6 (ground floor)

Title

Dialogue and Linguistic scaffolds as tools to help students making investigable questions

Authors *Concepció Ferrés Gurt and Jordi Domènech Casal*

Title

The history of biology and the promotion of good questions in the learning of the plasma membrane

Authors *Carol Joglar, Sandra Patricia Rojas R. Rojas, Ricardo De La Fuente and Veronica Astroza*

Title

Influence of Self-Efficacy and Motivation on Undergraduate Science Inquiry Practices

Authors *Melanie Peffer and Emily Royse*

12:15-13:30 Paper Session 2c (Strand: 8. Health education)
Chair: Claes Malmberg
Location: 0.7 (ground floor)

Title **Promotion of emotional competence in inclusive human biology lessons in class 5/6**

Authors *Laura Ferreira Gonzalez, Igor Osipov, Dennis Hövel, Thomas Hennemann and Kirsten Schlüter*

Title **Health and wellbeing – the school garden, a place to feel good**

Authors *Susan Pollin and Carolin Retzlaff-Fürst*

Title **Nutrition education and citizenship - Individual responsibility and democratic politics**

Authors *Claes Malmberg and Anders Urbas*

Title **The significance of school biology in everyday life: a case of HIV/AIDS knowledge among South African schoolgirls**

Authors *Lindelani Mnguni*

13:30-15:00 Lunch

15:00-16:30 Poster Session 1a (Strand: 1. Students' conceptions and conceptual change)
Chair: Aritz Uskola
Location: 0.5(ground floor)

Authors	Title
Aritz Uskola, Begoña Burgoa, Teresa Zamalloa and Gurutze Maguregi	Immune system model constructed by elementary pre-service teachers in a context about allergies and intolerances
Noureddine Zghida and Zouhaire Lamrani	Nutrition and reproduction students' conceptions regarding to animal classification
Sarah Schmid and Franz X. Bogner	Students' conceptions about the urban water-cycle
Theresa Heidenreich and Harald Gropengießer	The scientific clarification as the central task of lesson content design
Zofia Chyleńska and Eliza Rybska	A frog in a school throat – obstacles in sources of the students scientific knowledge about herpetology.

Bernat Esquiús Monrós and Arnau Amat Vinyoles	'How are plants dispersed?'. Children's Intuitive ideas in 6th grade
Jordi Domènech	Using problematized contexts to introduce the idea of classification criteria in taxonomy. Context-transference and resistant ideas.
María Martínez-Chico, Farida Abou Akl Sánchez and M.Rut Jiménez Liso	I won't believe it until I see it? An inquiry-based sequence on "Microorganisms" for secondary school

15:00-16:30

Poster Session 1b (Strand: 1. Students' conceptions and conceptual change)

Chair: Eliza Rybska

Location: 0.6(ground floor)

Authors	Title
Rita Gazdag, Martin Willmann, Jörg Großschedl and Marcel Bucher	Learning in a science outreach laboratory: Development of a learning material on the ecology of the rhizosphere
Arnau Amat, Laura Martín and Isabel Jiménez	How the nutrition function of the human body is explained by elementary pre-service teachers
Katharina Düsing, Roman Asshoff and Marcus Hammann	The Levels of Biological Organisation – Engaging with Students' Conceptions and Promoting a Coherent Understanding Using the Example of the Carbon Cycle
Peter Lampert, Suzanne Kapelari, Michael Kiehn and Martin Scheuch	Understanding Reproduction in Plants
Eliza Rybska and Jelle Boeve-De Pauw	Drawings on biology. How can drawings help to conceptualize flowers?
Helin Semilariski, Anne Laius and Uko Viisut	Analysis of the results of the university entrants' tests in biology

15:00-16:30

Poster Session 1c (Strand: 5. Teaching strategies and teaching environments)

Chair: Tali Tal

Location: 0.7(ground floor)

Authors	Title
Isabel Jiménez Bargalló, Arnau Amat Vinyoles and Jordi Martí Freixas	Scientific posters within biodiver project: formative assessment in undergraduate primary teachers' courses

	Tali Tal, Irene Bayer and Kara Haas	Elementary School Teachers Learning Life-Sciences Outdoors
	José María Marcos-Merino, Rocío Esteban Gallego and Jesús Gómez Ochoa de Alda	Training pre-service teachers to approach interdisciplinary: learning Physics and Chemistry at Biology lessons
	Katrin Kaufmann and Andrea Moeller	Influence of Role Assignment on Student Activity during Cooperative Inquiry Learning in Science Class
	Helge Gresch	Dealing with Teleological Explanations – A Language Issue in Evolution Classes?
	Idit Adler, Tali Tal, Irene Bayer, Jane Lee, Stephen Modell, Ella Greene-Moton, Toby Citrin and Joseph Krajcik	“Models in action”: Using scientific knowledge for social action to support science learning
	Beatriz Carrasquer Álvarez, Adrián Ponz Miranda and M ^a Victoria Álvarez Sevilla	The floral diagram as a didactic resource
	Irma Mavrič Gavez and Gregor Torkar	Herbarium in primary teacher education
	Emilio Costillo, Isaac Corbacho, Ana Belén Borrachero, María Carmen Conde, José Samuel Sánchez and Vicente Mellado	Cognitive and affective domains in nature field trips designed by prospective teachers
	Bianca Kuhlemann and Corinna Hößle	Students of Biology Teacher Education develop diagnostic tasks and assess their potential
16:30-17:00	Coffee Break	
	Paper Session 3a (Strand: 2. Students’ interest and motivation)	
17:00-18:30	<i>Chair: Ute Harms</i>	
	<i>Location: 0.5(ground floor)</i>	
Title	Academic Self-Concept and its Relation to Achievement – Biology-Specific or Science bound?	
Authors	<i>Jörg Großschedl, Virginia Welter and Ute Harms</i>	
Title	Microbiology learning through homemade microorganisms’ culture: role of students’ emotions and values	

Authors José María Marcos-Merino, Rocío Esteban Gallego and Jesús Gómez Ochoa de Alda

Title Long-term knowledge over one year with a student-centered inquiry-based learning module about bionics.

Authors Michaela Marth and Franz X Bogner

Title Engaging students in studying Human biology through Digital Storytelling

Authors Maria Dokopoulou and Evangelia Pavlatou

17:00-18:30 Paper Session 3b (Strand: 3 Students' values, attitudes and decision-making)

Chair: Janice Griffiths

Location: 0.6(ground floor)

Title Decision Making Considerations of Israeli Religious Undergraduate Students in the Field of Genetic Testing and Genetic Counseling.

Authors Merav Siani and Orit Ben-Zvi Assaraf

Title Decision-making competence regarding the possibilities of genome editing

Authors Laura Maria Heinisch, Corinna Hößle, Ulrike-Marie Krause and Wiebke Rathje

Title Evolution, affect and acceptance: A psychoanalytical examination of the controversy

Authors Emma Newall

Title Persuasive effects of role-play about a socio-scientific issue

Authors Melanie Basten and Matthias Wilde

Title Students' views on the value of protecting biodiversity

Authors Marcus Grace, Carys Hughes and Janice Griffiths

17:00-18:30 Paper Session 3c (Strand: 7. Environmental education)

Chair: Michael Reiss

Location: 0.7(ground floor)

Title Ecosystems in science education research in the last 20 years

Authors Pedro Lucha and María José Sáez Bondía

Title An analysis of seventh grade students' mental models concerning climate change

Authors Vanessa Sesto and Isabel García-Rodeja

Title **Regenerating our place: Fostering a sense of place through rehabilitation and place-based education**

Authors *Wisam Sedawi, Orit Ben Zvi- Assraf and Michael Reiss*

Title **“This curse of knowledge...” How do biodiversity scientists connect their expertise to their understanding of nature?**

Authors *Judith Wiegelmann and Jörg Zabel*

Title **Measurement Tools for the Competence Model for Environmental Education**

Authors *Lisa Felix-Strishock, Bruce Johnson and Sanlyn Buxer*

18:40-19:40 Early Career Researchers’ meeting point

Location: 0.5 (ground floor)

Wednesday July 4th

Location: Facultad de Educación (<https://educacion.unizar.es/en>)

9:00-10:30 Paper Session 4a (Strand: 4. Scientific thinking, nature of science and argumentation)

Chair: Birgitta Berne

Location: 0.5(ground floor)

Title **Learning using contradictory texts promotes students' critical thinking**

Authors *Moriah Ariely and Anat Yarden*

Title **Assessing professional vision of biology teacher students**

Authors *Friederike Kaiser and Philipp Schmiemann*

Title **Contingency in Peer Scaffolding when Addressing Socio-scientific Issues in Biotechnology**

Authors *Birgitta Berne*

9:00-10:30 Paper Session 4b (Strand: 5. Teaching strategies and teaching environments)

Chair: Sue Dale-Tunnickliffe

Location: 0.6(ground floor)

Title **Teaching to teach the model of evolution in Primary Education: an experience with pre-service teachers at a Spanish university**

<i>Authors</i>	<i>Lucía Vázquez-Ben and Ánxela Bugallo-Rodríguez</i>
<i>Title</i>	A role-change approach in biology pre-service-teacher education at an outreach lab: a direct replication study adding a new focus on module-phase-dependent development of pedagogical content knowledge
<i>Authors</i>	<i>Franz-Josef Scharfenberg and Franz X. Bogner</i>
<i>Title</i>	Natural history dioramas for teaching biodiversity on an ecosystem level: Programme for pre-service biology teacher education
<i>Authors</i>	<i>Špela Hrast, Ljerka Trampuž, Staša Tome, Sue Dale Tunnicliffe and Gregor Torkar</i>
<i>Title</i>	Pre-service teachers' use of research: from pedagogic soup to reflective practitioners through conjecture maps?
<i>Authors</i>	<i>Francois Lombard, Laura Weiss and Marie Merminod</i>
<i>Title</i>	Discipline-based or context-based? A comparison of Biology curriculum in four countries.
<i>Authors</i>	<i>Edith Dempster</i>
9:00-10:30	<p>Paper Session 4c (Strand: 5. Teaching strategies and teaching environments)</p> <p><i>Chair: Roald Verhoeff</i></p> <p><i>Location: 0.7(ground floor)</i></p>
<i>Title</i>	Topic-specific didactics in biology in higher education – easily achieved but absent in biology faculty teaching
<i>Authors</i>	<i>Kristina Andersson and Annica Gullberg</i>
<i>Title</i>	Make biology relevant again! Student teachers' views on the relevance of biology education
<i>Authors</i>	<i>Justus Mutanen and Anna Uitto</i>
<i>Title</i>	Can prompt-cards support students' self-efficacy regarding experimentation and their quality of motivation during experimentation in biology lessons?
<i>Authors</i>	<i>Cornelia Stiller, Alexandra Stümmeler and Matthias Wilde</i>
<i>Title</i>	Systems thinking and the theoretical nature of seeing coherence
<i>Authors</i>	<i>Roald Verhoeff, Melde Gemma Regina Gilissen and Marie-Christine Knippels</i>
<i>Title</i>	Storytelling as an educational tool in biology teaching: a pilot study
<i>Authors</i>	<i>Nausica Kapsala and Evangelia Mavrikaki</i>

10:30-11:00 Coffee Break

Paper Session 5a Symposium (Strand: 5. Teaching strategies and teaching environments)

11:00-12:15 **Title: Thoughtfulness in Biology Education**

Chair: Marie-Christine Knippels

Location: 0.5(ground floor)

Title **Multi-disciplinary reflections on Thoughtfulness in Biology Education**

Authors *Paul Davies, Haira Emanuela Gandolfi, Ralph Levinson & Stephen Price*

Title **Narratives as a way to foster thoughtfulness in biology education**

Authors *Marie-Christine Knippels, Jörg Zabel, Julia Zdunek & Alexandra Slegers*

Title **The Role of Students' Beliefs about Neuroscientific Research in Moral and Philosophical Reasoning**

Authors *Alexander Bergmann & Jörg Zabel*

Title **Thoughtful Teachers, Thoughtful Moments, Thoughtful Students? – A Critical Reflection on the Culture of Learning in Biology Classes and Biology Teacher Training**

Authors *Arne Dittmer & Britta Lübke*

Paper Session 5b (Strand: 4. Scientific thinking, nature of science and argumentation)

11:00-12:15

Chair: Orit Ben-Zvi Assaraf

Location: 0.6(ground floor)

Title **Use of Evidence by 3-4 and 5-6 year-olds: a Comparative Study**

Authors *Sabela F. Monteiro, María Pilar Jiménez-Aleixandre and Pablo Brocos*

Title **Effects of redundancy in multiple external representations on biology test performance**

Authors *Lara Magnus, Kerstin Schütte and Julia Schwanewedel*

Title **Comparison of Student Primary Literature Reading Approaches to a Deep and Surface Learning Model**

Authors *Kirk Hepburn, Emily Leaman, George Ogolo, Tamunoibim Sambo and Nienke van Houten*

Title **A short intervention that promotes the abstract reasoning scheme improves ninth graders' achievements in photosynthesis**

<i>Authors</i>	<i>Reuven Babai and Esty Fridman</i>
12:15–13:30	<p>Paper Session 6a (Strand: 4. Scientific thinking, nature of science and argumentation)</p> <p><i>Chair: Marcus Grace</i></p> <p><i>Location: 0.5(ground floor)</i></p>
Title	Is teaching Biology through socioscientific issues enough for the development of argumentation skills?
<i>Authors</i>	<i>Martha Georgiou, Evangelia Mavrikaki and Constantinos Constantinou</i>
Title	Students' arguments and reasoning in genetics: dealing with the complex interactions between genotype and phenotype in the expression of animal diseases.
<i>Authors</i>	<i>Noa Ageitos Prego, Laura Colucci-Gray and Blanca Puig</i>
Title	Students' Reasoning About Teleological Agency
<i>Authors</i>	<i>Friederike Trommler and Marcus Hammann</i>
12:15–13:30	<p>Paper Session 6b (Strand: 5. Teaching strategies and teaching environments)</p> <p><i>Chair: Jelle Boeve-de Pauw</i></p> <p><i>Location: 0.6(ground floor)</i></p>
Title	Fostering prospective biology teachers' diagnostic competence – Effects of an intervention on basic diagnostic skills
<i>Authors</i>	<i>Tobias Alexander Joos and Ulrike Spörhase</i>
Title	Recording and Promotion of subject-specific Professional Knowledge and Beliefs of prospective Biology Teachers
<i>Authors</i>	<i>Katharina Gimbel and Kathrin Ziepprecht</i>
Title	What TIMSS tells us about education for sustainable development - a comparative study between biology and science teachers in Sweden
<i>Authors</i>	<i>Jelle Boeve-De Pauw and Niklas Gericke</i>
Title	The effects of teacher self-efficacy and experienced Biology lessons as a student at school on prospective teachers' beliefs about teaching and learning Biology
<i>Authors</i>	<i>Fabian Schumacher, Melanie Basten and Matthias Wilde</i>
12:15–13:30	<p>Paper Session 6c (Strand: 9. Social, cultural, and gender issues)</p> <p><i>Chair: Bev France</i></p>

Location: 0.7(ground floor)

Title **Giving the silent a voice: How rangatahi used Actor-Network Theory to unravel the complexity of a New Zealand native forest ecosystem.**

Authors *Bev France and Sally Birdsall*

Title **Gender differences of estonian gymnasium students' biological cognitive skills within socio-scientific issue of lactose intolerance**

Authors *Anne Laius, Helin Semilarski and Uko Viisut*

Title **Differences in subject teachers' perceptions of their role in promoting sustainability school culture**

Authors *Anna Uitto and Seppo Saloranta*

Title **Teaching for less reductionism in biology education: students' views on the compatibility of science and religion**

Authors *Michael Reiss and Tamjid Mujtaba*

13.30:15:00 Lunch

16:00-20:00 Tours – social event

Thursday July 5th

Location: Facultad de Educación (<https://educacion.unizar.es/en>)

Paper Session 7a (Strand: 1. Students' conceptions and conceptual change)

9:00-10:00 *Chair: Xana Sá-Pinto*

Location: 0.5(ground floor)

Title **Context-dependency of beliefs in genetic determinism: Indications for a mind-body split?**

Authors *Johannes Zang, Tim Heemann and Marcus Hammann*

Title **Understanding of evolution through natural selection in university freshmen: a comparison between students graduating from secondary education in Flanders, Belgium and the Netherlands.**

Authors *Rianne Pinxten and Ellen Vandervieren*

Title **How to make evolution an operational concept to understand the world: learning with Darwin.**

Authors *Xana Sá-Pinto, Alexandre Pinto and Joaquim Bernardino Lopes*

9:00-10:00 Paper Session 7b (Strand: 5. Teaching strategies and teaching environments)

Chair: Christine Knippels

Location: 0.6(ground floor)

Title **Instructional efficiency in an outreach lab: Model constructors versus model viewers**

Authors *Julia Mierdel and Franz Bogner*

Title **No Escape: the rise of Escape Rooms in secondary biology education. What do teachers and students perceive as the educational potential of Escape Rooms in secondary biology education?**

Authors *Alice Veldkamp, Marie-Christine P.J. Knippels and Wouter van Joolingen*

Title **Bifurcated Domino Path Approach: the theoretical output of a ‘design research’ study**

Authors *Georgios Ampatzidis and Marida Ergazaki*

Paper Session 7c (Strand: 7. Environmental education)

9:00-10:00 *Chair: Franz Bogner*

Location: 0.7(ground floor)

Title **Using two theoretical models to measure environmental perceptions in earth education**

Authors *Constantinos Manoli, Bruce Johnson and Sanlyn Buxner*

Title **How Appreciation of Nature intervenes with the Major Environmental Values (2-MEV)**

Authors *Franz X. Bogner and Michael Wiseman*

Title **Diagnoses of teachers regarding students’ strategies when addressed as moral subjects in the context of ESD**

Authors *Anne-Katrin Holfelder*

Paper Session 8a (Strand: 5. Teaching strategies and teaching environments)

10:00-11:30 *Chair: Anat Yarden*

Location: 0.5(ground floor)

Title **Inconsistent representation of alleles' symbols in textbooks**

Authors *Michal Haskel-Ittah, Ravit Golan Duncan and Anat Yarden*

Title **Prepared to teach genetics in school? – Examination of beliefs about learning content and instructional practice as well as academic self-concept of prospective biology teachers**

Authors Kathrin Ziepprecht, Katharina Gimbel and Jaqueline Jäger
Title Epigenetic literacy and the implementation of epigenetics in school biology

Authors Niklas Gericke, Birgitta Mc Ewen and Karin Thörne
Title Genetics contents and societal issues – what are the approaches the secondary school biology teachers use in their teaching?

Authors Tuomas Aivelo and Anna Uitto
Title Representations of gene models in Greek secondary school biology textbooks

Authors Akrivi Christidou and Penelope Papadopoulou

10:00-11:30 Paper Session 8b (Strand: 6. Teaching and learning with educational technology)
Chair: Konrad Schonborn
Location: 0.6(ground floor)

Title Using an Innovative Online Modeling Tool to Support Students' Modeling Practice

Authors Tom Bielik and Sebastian Opitz

Title Digitally Led Experiments - Results of an Evaluation Study with the App divox

Authors Monique Meier

Title Interacting with Digital Touch Tables to Explore the Biological Microcosmos

Authors Konrad Schönborn, Gunnar Höst, Henry Fröcklin and Lena Tibell

Title Effectiveness of digital versus traditional (paper-based) dichotomous keys for identification of woody species

Authors Gregor Torkar

Title Supporting students' freedom during mobile-aided fieldwork in a biology lesson

Authors Anttoni Kervinen, Anna Uitto and Kalle Juuti

10:00-11:30 Paper Session 8 c (Strand: 6. Teaching and learning with educational technology)
Chair: Ruth Amos
Location: 0.7(ground floor)

Title **Combining biology education & education for sustainability in preschool: Insights from the 2nd cycle of a design research study**

Authors *Maria-Christina Kasimati and Marida Ergazaki*

Title **Investigating the Short- and Medium-term Effects of a School Kitchen-garden Project on Elementary School Students' Environmental Conceptions**

Authors *Stella Petrou and Konstantinos Korfiatis*

Title **Learning in nature: primary school children develop through biological experiences which connect the curriculum**

Authors *Ruth Amos and Michael Reiss*

Title **The potential of using digital tools in an environmental education context to address pollinator conservation issues**

Authors *Mona Schönfelder and Franz X. Bogner*

11:30-12:00 Coffee Break

Poster Session 2a (Strand: 2. Students' interest and motivation & 3. Students' values, attitudes and decision-making)

12:00-13:30

Chair: Beatriz Bravo Torija

Location: 0.5(ground floor)

Authors	Title
Inga Desch, Christian Vollmer and Peter Wüst-Ackermann	Gender Differences in attitudes towards animals and nature
Sergio Calavia Lombardo, Beatriz Bravo Torija and M.J. Gil Quílez	Analysis of the contents of bioethics topics in Science Culture textbooks
Alexandros Amprazis and Penelope Papadopoulou	Attitudes towards plants: Evaluating the intensity of the "Plant Blindness" phenomenon in Greek primary schools.
Katarzyna Potyrala, Małgorzata Klys and Karolina Czerwiec	Biology students - future teachers' knowledge and attitudes towards migrations of species and diseases caused by insects
Stephanie Ohlberger and Claas Wegner	Differences between girls and boys regarding motivational changes due to bilingual modules in biology

Annette Scheersoi, Jonathan Hense and Lara Weiser	Multico: Promoting students' interest and their awareness of science careers
Nadine Großmann and Matthias Wilde	The effects of autonomy-supportive and controlling teaching behavior on students' goal orientations in biology lessons
Susana García-Barros, María Jesús Fuentes-Silveira and Paula Ramos-Fariña	Ideas about the model of what a living is being expressed by secondary school pupils and teachers in training

12:00-13:30

Poster Session 2b (Strand: 4. Scientific thinking, nature of science and argumentation)

Chair: Ohad Levkovich

Location: 0.6(ground floor)

Authors	Title
Sue Dale Tunnicliffe and Catherine Bruguere	Biology concepts and Pictorial Fiction Books. Do early years children comprehend?
Stephen Price, Paul Davies, Haira Gandolfi and Ralph Levinson	School students' engagement with contemporary biological research
Dagmar Frick and Claudia Nerdel	Acquisition of Mental Models in the Mathematical Modelling of Population Dynamics
Pablo Brocos and María Pilar Jiménez-Aleixandre	The optimization strategy as a scaffold for argumentation and decision-making about diets in secondary education
Anna Marbà-Tallada and Jordi Domènech-Casal	Promoting the role of data and scientific models in students' argumentation on socio-scientific issues through communication scaffolds
Torsten Kreher and Carolin Retzlaff-Fürst	Effects of Scientific Literacy on School Garden as an Extracurricular Place for Learning on Understanding of Nature of Science by Pupils of Secondary Classes
Martin Feike and Carolin Retzlaff-Fürst	Frequency of mathematical exercises in biology classes
Ohad Levkovich and Anat Yarden	Viewing molecular models of proteins via Jmol: Evaluating students' epistemic knowledge about models

Diego Armando Retana-Alvarado, María Marta Camacho-Álvarez, Bartolomé Vázquez-Bernal and Andrés Osborne-Rovira

Emotions of Costa Rican Secondary students towards the development of a research project

12:00-13:30

Poster Session 2c (Strand: 6. Teaching and learning with educational technology & 7. Environmental education)

Chair: Maria Cristina Pansera de Araujo

Location: 0.7(ground floor)

Authors	Title
Emanuel Nestler and Carolin Retzlaff-Fürst	Teaching Scientific Inquiry in Biology: an Intervention Study about Mentoring for Pre-Service Biology Teachers
Charalambia Lazaridou and Zacharias Zacharia	"Capturing" photosynthesis via mobile learning
Michal Topaz and Tali Tal	Inspired by Bioinspiration at the zoo: Three case-studies
Jennifer Schneiderhan and Franz X. Bogner	Students' attitudes towards biodiversity conservation
Arritokieta Ortuzar-Iragorri, Iñaki Sanz-Azkue, Aritz Ruiz-Gonzalez and Joserra Díez	The plant species repertoire of basque secondary education students and their interest in nature
Jenny Duarte, Edgar Valbuena and Maria Cristina Pansera de Araujo	Environmental education from the Biology class. Animal abuse as a fully encompassing content

13:30-15:00

Lunch

Business meeting

15:00-16:00

Location: Conference hall (basement)

16:00-16:30

Coffee Break

16:30-17:30

Poster Session 3a (Strand: 5. Teaching strategies and teaching environments)

Chair: Manon Albert

Location: 0.5(ground floor)

Authors	Title
Manon Albert and Marie-Claude Bernard	Teachers' views on integrating socially acute questions (SAQ) into biology classrooms: role of the curriculum and the organizational structure in Québec's colleges
M ^a -Jesús Fuentes-Silveira, Juan Rivadulla-López, Susana García-Barros and Cristina Martínez-Losada	Is biodiversity necessary in the ecosystem? A classroom experience
Maria Cristina Pansera-De-Araújo and Rúbia Emmel	The practice of research-training-action, basic education curriculum and textbook, in a biological sciences degree
Lissy Jäkel, Sabrina Frieß, Ulrike Kiehne and David Hergesell	Processes of professionalisation – Outdoor teaching and assessment of PCK
Elke Blodau, Lissy Jäkel and David Hergesell	Suitability of zoo animals for sustainability topics for primary school children

Poster Session 3b (Strand: 5. Teaching strategies and teaching environments & 9. Social, cultural, and gender issues)

16:30-17:30

Chair: Evangelia Mavrikaki

Location: 0.6(ground floor)

Authors	Title
Marlen Grimm and Carolin Retzlaff-Fuerst	Learning and teaching with rubrics (Kompetenzraster) - Development and evaluation of inclusive learning environments in biology classes to foster students' success and motivation
Emilio Costillo, José María Merino, Rocío Esteban, Javier Cubero, José Antonio Regodón and José Ramón Vallejo	Analysis of the pedagogical strategies used by prospective teachers to design nature field trips
Joanne Nicholl	Exploring pre-service biology teachers' experiences on a zoo trip
Diego Armando	Emotions of teachers in initial formation towards the

Retana-Alvarado, teachers of Experimental Sciences Didactics according to gender
 María Ángeles De Las Heras-Pérez,
 Bartolomé Vázquez-Bernal and Roque Jiménez-Pérez

Evangelia Mavrikaki, Approaching health issues and Europe's history and cultural heritage through differences in food and Nausica Kapsala and Apostolia Galani culinary representations in school textbooks

Poster Session 3c (Strand: 8. Health Education)

16:30-17:30

Chair: Graça S. Carvalho

Location: 0.7(ground floor)

Authors	Title
Graça S. Carvalho, Liziane Martins and Charbel El-Hani	The relevance of Biomedical and Socioecological approaches in school Health Education
Graça Carvalho, Paulo Mafra and Nelson Lima	Primary school health education: how children can learn about microbes and hands hygiene
Sarah Dannemann	Effects on primary and comprehensive school teachers' attitudes, knowledge, and self-efficacy of health education during their participation in an activity program in class
Eliane Gonçalves Dos Santos and Maria Cristina Pansera de Araújo	Study of sexually transmissible diseases in commercial films: contributions to health education in teaching training

Poster Session 3d (Strand: 10. Practical work and field work)

16:30-17:30

Chair: Ángel Luis Cortés Gracia

Location: 0.4(ground floor)

Authors	Title
Andrej Šorgo and Urška Cigler	Teacher assessment, grading and feedback: biology laboratory work in Slovenian secondary school
María José Sáez Bondía and Ángel Luis Cortés Gracia	How do pre-service teachers address tree and bush identification?
Sebastian Opitz, Jasmin Colakoglu and Ute Harms	First steps in Researching the International Biology Olympiad: Analyzing what IBO Exams Assess

	Beatriz Bravo-Torija, Beatriz Mazas-Gil, María José Gil-Quílez, Begoña Martínez-Peña and Nerea Idoipe- Gómez	Applying scientific skills in a mould experience in Primary Education: How could we prevent the moulds coming out in food?
17:30-18:30	Researchers' café Conference Dinner	
20:00-23:30	Aura Restaurant https://aurarestaurante.com/contacto/	

Friday July 6th

	Location: Facultad de Educación (https://educacion.unizar.es/en)
	Round table about “Publishing in Biology Education Research”
9:00-9:45	Tom Ireland, Editor of <i>The Biologist</i> and Managing Editor of the <i>Journal of Biological Education</i> (Royal Society of Biology, UK), Kostas Kampourakis (University of Geneva, Switzerland) and Michael Reiss (University College London, UK) <i>Chair: Marcus Grace</i> <i>Location: Conference hall (basement)</i> Key note 2: <i>Jesús Martínez de la Fuente</i>
9:45-10:45	Nanomedicine: New Challenges for Biotechnology <i>Chair: Maria José Gil Quílez</i> <i>Location: Conference hall (basement)</i>
10:45-11:15	Coffee Break
11:15-12:15	Paper Session 9a (Strand: 1. Students' conceptions and conceptual change) <i>Chair: Marida Ergazaki</i> <i>Location: 0.5 (ground floor)</i>
Title	Exploring the role of person analogy in young children's reasoning about the biological world
Authors	<i>Marida Ergazaki, Aggeliki Dimitrakopoulou and Spai Alexandra</i>
Title	There and back again – a journey into undergraduate students' tree

thinking

Authors Petra Korall

Paper Session 9b (Strand: 10. Practical work and field work)

11:15-12:15 *Chair: Carys Hughes*

Location: 0.6 (ground floor)

Title Inquiry is NOT Only about Hands-On Learning: Insights into Inquiry-Based Science Education from Two Different Teachers Groups

Authors Shani Zur, Tali Tal and Mahsa Tsaushu

Title Proposal of a Model for Professional Development: Perspectives and Stages that contribute to the improvement of the practice of teaching biology

Authors Eduardo Ravanal Moreno and Édgar Valbuena Ussa

Title Field practices as a strategy in the teaching of biology and in the training of future teachers. A study at the universidad surcolombiana

Authors Elías Francisco Amórtegui Cedeño, Olga Mayoral García-Berlanga and Valentin Gavidia Catalan

Paper Session 9c (Strand: 11. Research methods and theoretical issues)

11:15-12:15 *Chair: María José Gil Quílez*

Location: 0.6 (ground floor)

Title Curriculum narrowing in the university entrance assessment in Biology

Authors Francisco Luis Alda, María José Gil Quílez and María Jesús Rodríguez Yoldi

Title In search of a notion of biological competence for primary education: A review of research articles

Authors Jairo Ortiz-Revilla, Ileana M. Greca and Agustín Adúriz-Bravo

12:15-13:00 Closing ceremony

13:30-15:00 Lunch

