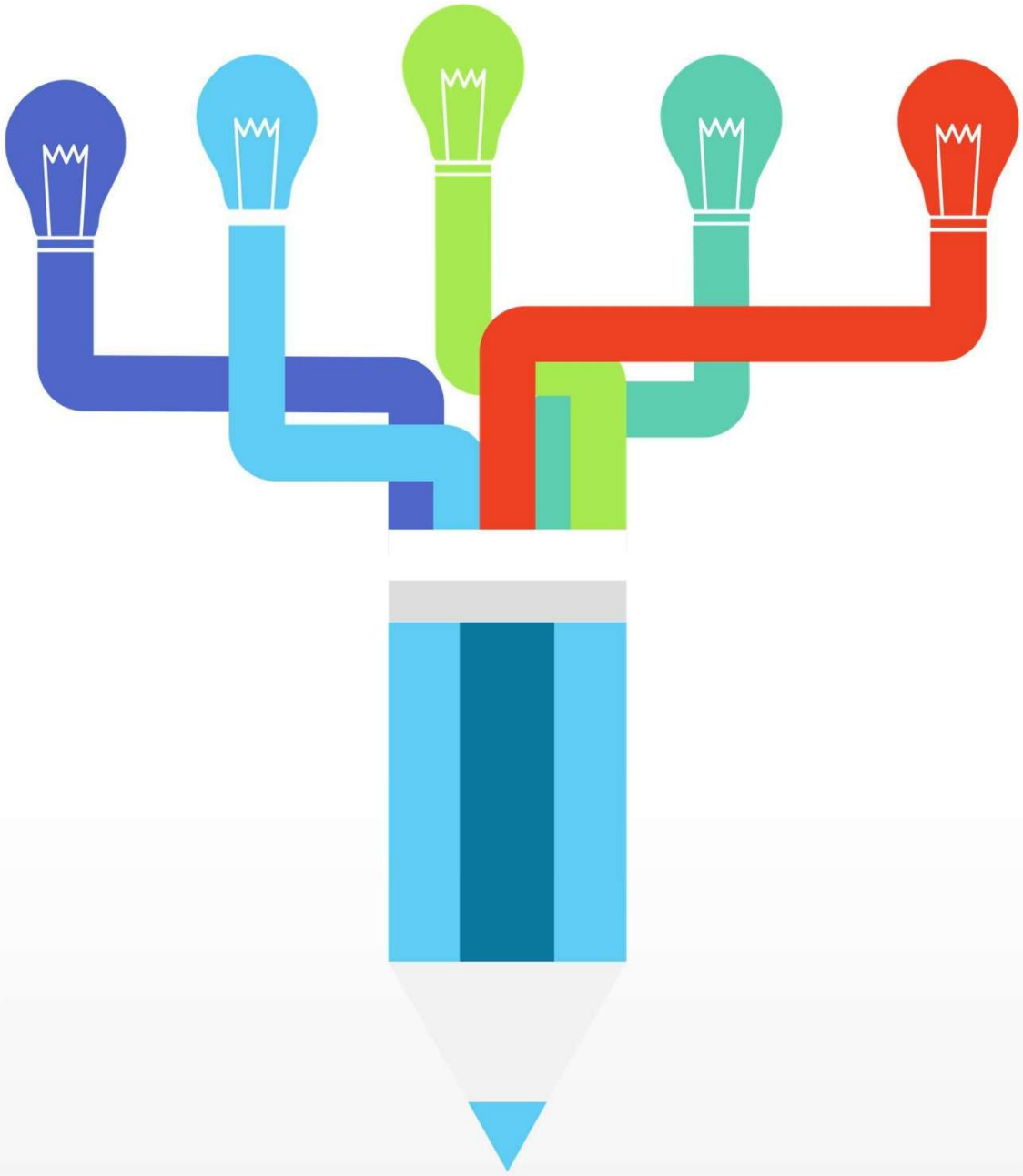
1st International Caparica Conference on Science Education

4th – 7th May 2025 | WWW.SCIEDU2025.COM



BIOSCOPE RESEARCH
IN THE FOREFRONT OF SCIENCE

PROTEOMASS
SCIENTIFIC SOCIETY

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SCIEDU 2025

1st International Caparica Conference on Science Education

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Caparica – Portugal, 2025

BOOK OF ABSTRACTS

1st International Caparica Conference on Science Education

Hotel TRYP Lisboa Caparica Mar
Caparica | Portugal

4th – 7th May 2025

PROTEOMASS
SCIENTIFIC SOCIETY

INDEX

WELCOME SCIEDU 2025

1st International Caparica Conference on Science Education 2025

On behalf of the BIOSCOPE Research Group
SciEdu 2025 – International Conference on Science Education
Costa de Caparica, May 4–7, 2025

Dear Friends,

In a time when science, education, and freedom of thought face mounting challenges in various parts of the world it becomes ever more urgent to reaffirm the role of universities as spaces of critical thinking, intellectual honesty, and global cooperation.

The BIOSCOPE Research Group is proud to welcome you to SciEdu 2025, the first edition of this international gathering dedicated to rethinking and reshaping science education for the next generation. This conference was born from the belief that science is not only a body of knowledge, but also a collective endeavour rooted in trust, dialogue, and openness. And education, when driven by those principles, becomes a powerful tool to resist ignorance, polarization, and authoritarian tendencies.

We are witnessing, pressures on academic autonomy, restrictions on curricula, and even the erosion of protections for educators and researchers. These developments remind us that democracy and science are interdependent. When education suffers, so does society. When we silence universities, we silence progress.

Debates around the use of digital technologies in the classroom, particularly mobile phones and laptops , reflect deeper questions about attention, agency, and pedagogy. While some argue for strict bans in the name of focus, others advocate for thoughtful integration of technology as a way to engage students and reflect the realities of how science is practiced today. At SciEdu 2025, we invite participants to confront these questions directly, examining not only what we teach, but how and with what tools.

WELCOME

SciEdu 2025 gathers educators, scientists, policy-makers, and students from around the world to reimagine science teaching not just as content delivery, but as empowerment. We aim to explore pedagogical innovation, equitable access, and the integration of ethics and citizenship in scientific training.

As BIOSCOPE, we believe that solidarity across borders is more than a value - it is a necessity. In this spirit, we welcome all participants to Caparica with an open heart and a shared purpose: to build bridges, question assumptions, and shape a more resilient, inclusive, and free scientific community [1].

Let this conference be a place of listening and action. Let us reclaim the future of science education — together.

BIOSCOPE Research Group
Caparica, Spring 2025

[1] J. L. Capelo et al. Advancing Diversity, Equity, and Inclusion in Scientific Research, Public Health, and Biomedical Innovation, DOI: 10.5584/jiomics.v15i1.240

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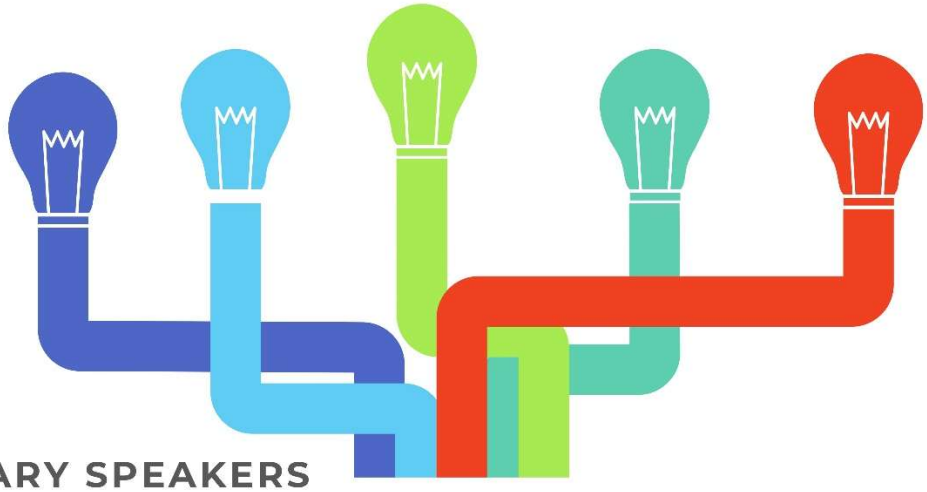


PLENARY SPEAKERS

Emilia Bertolo
Canterbury Christ Church University (UK)

Pier Luigi Gentili
Perugia University (Italy)

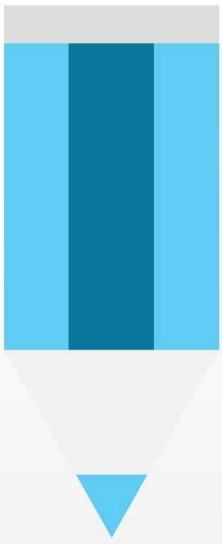
Luis Mota-Bravo
University of California (USA)

Marlene de la Cruz
University of California (USA)

Laura Mercolini
University of Bologna (Italy)

Luca Ferrari
University of Bologna (Italy)

Katia Karadjova-Kozhuharova
Georgia Southern University (USA)



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1st SCIEDU 2025 - Participants' Demographics

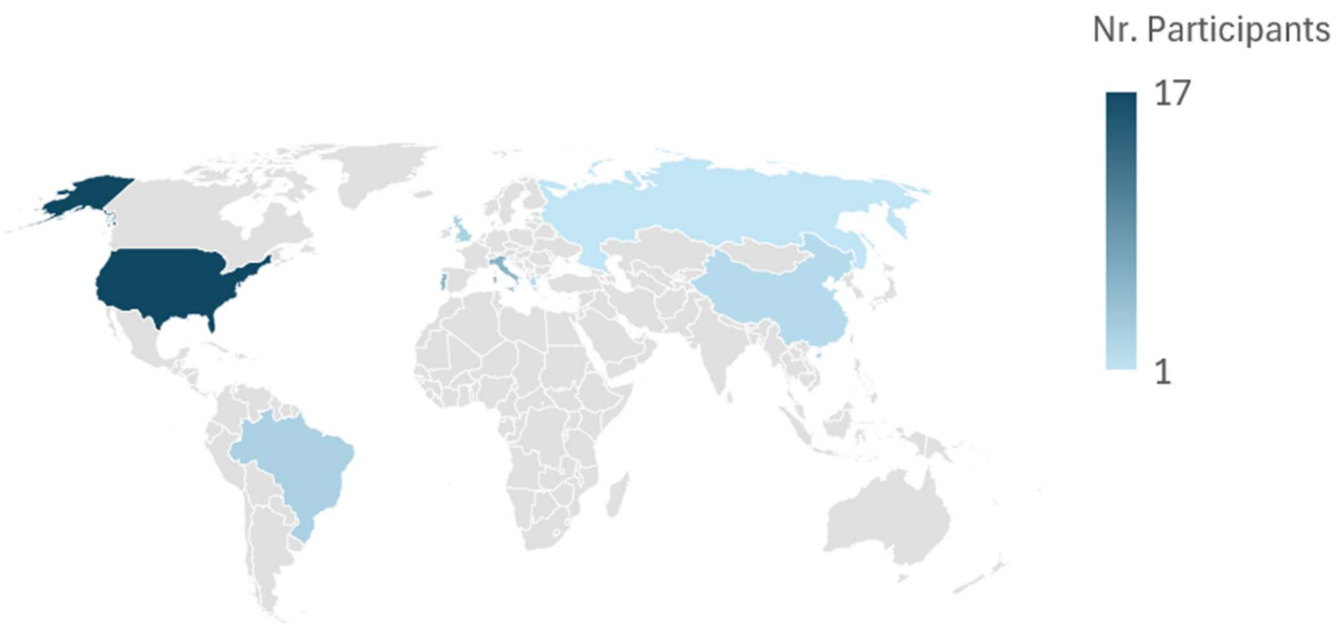

Figure 1 - Participants in the 1st SciEdu 2025 Conference by country: Brazil (3), China (2), Greece (2), Italy (6), Portugal (6), Russia (1), United Kingdom (3), United States of America (17)

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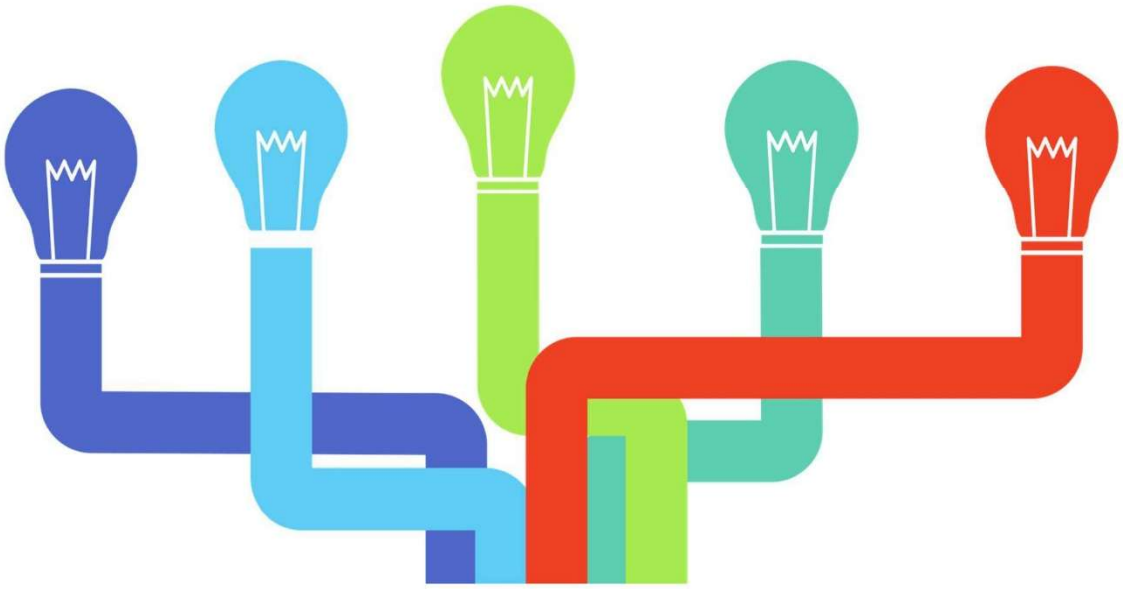

COMMITTEES

CONFERENCE CHAIRS

José Luis Capelo Martínez

Full Professor

Head of the Bio-analytics & Proteomics Laboratory
BIOSCOPE Research Group & (Bio)Chemistry and OMICS Group, LAQV-REQUIMTE, Department of Chemistry
NOVA School of Science and Technology, NOVA University Lisbon (Caparica, Portugal)
Chairman of the PROTEOMASS Scientific Society

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Dr. J. L. Capelo got his PhD from the University of Vigo (2002), made a post-doc in the IST-UL in Lisbon (2002-2005) and then was appointed as a researcher at REQUIMTE (FCT-UNL, 2005-2009). Then, he moved to the University of Vigo as PI (2009-2012). He was appointed assistant professor in the NOVA FCT in 2012, where he is currently based. In 2017, he got a position in Analytical Proteomics at NOVA FCT and became an associate professor of Biochemistry in the Department of Chemistry at NOVA FCT. In 2024, he became a full professor of Biochemistry at the same institution. Dr. Capelo is a Fellow of the Royal Society of Chemistry and a member of the Portuguese Chemistry Society.
He is the head of the Bio-analytics & Proteomics Laboratory and co-head of the BIOSCOPE Research Group (www.bioscopegroup.org), Chairman of the PROTEOMASS Scientific Society, and Founder co-CEO of the Chemicals start-up Nan@rts. Dr. Capelo has developed research on the following topics: (i) Quantification of metal and metals species in environmental and food samples, (ii) new methods to speed protein identification and quantification using mass spectrometry-based workflows, (iii) accurate bottom-up protein quantification, (iv) Bacterial identification using mass spectrometry, (v) fast determination of steroids in human samples; (vi) biomarker discovery, (vii) Application of dyes and chemosensor to the detection/ quantification of metals and (vii) new applications of Nanoparticles in nanoproteomics and nanomedicine. Dr. Capelo has mentored 12 PhDs.

Carlos Lodeiro Y Espiño

Full Professor

Head of the Nanosynthesis, Chemosensors and Spectroscopy Laboratory
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NOVA School of Science and Technology, NOVA University Lisbon (Caparica, Portugal)
CEO of the PROTEOMASS Scientific Society

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Professor C. Lodeiro graduated in Chemistry in 1995 and received his PhD in chemistry in 1999 by the University of Santiago de Compostela, Spain. In 1999 he moved to the NOVA University Lisbon (UNL), Portugal as a European Marie Curie postdoctoral researcher in a project concerning molecular devices and machines, and in 2004 he became a fellow researcher and invited assistant lecturer at the REQUIMTE-CQFB, Chemistry Department (UNL). In 2008 Dr. Lodeiro got the habilitation in Chemistry in Spain, and a year later in 2009 he moved to the University of Vigo, Faculty of Sciences of Ourense (FCOU), Spain as IPP (Isidro Parga Pondal) researcher-lecturer. In 2012 became Assistant Professor at the Chemistry Department UCIBIO-REQUIMTE Laboratory in the NOVA Science and Technology School, UNL. Dr. Lodeiro is Fellow of the Royal Society of Chemistry since 2014 and member of the Portuguese Chemistry Society since 2002 and the American Chemical Society since 2016. In 2017 got the habilitation in Inorganic Analytical Chemistry in Portugal at the FCT-UNL and became Associate Professor in the Chemistry Department FCT-UNL.

In 2024 became Full Professor in Chemistry. Prof Lodeiro is author and coauthor of more than 320 papers and 550 conference communications. Presently, he co-leads the BIOSCOPE research group (www.bioscopegroup.org), he is CEO of the PROTEOMASS Scientific Society, and Founder coCEO of the Chemical start-up Nan@rts. His research interest comprises (i) physical-organic and physical-inorganic chemistry of dyes and chemosensors, (ii) synthesis of Functionalized Nanoparticles, Nanocomposites and Nanomaterials (iii) applications of nanomaterials in environmental research, (iv) application of nanomaterials in bio-medical research, (v) supramolecular analytical proteomics, and (vi) Onco and Nanoproteomics. C. Lodeiro has mentored 13 PhDs plus 4 in progress.

Elisabete Oliveira

Head of the Laboratory for Mesoporous Silica Nanoparticles, Imaging and Drug Delivery
BIOSCOPE Research Group, LAQV-REQUIMTE, Department of Chemistry - NOVA School of Science and Technology, NOVA University Lisbon (Caparica, Portugal) - PROTEOMASS Scientific Society

ej.oliveira@fct.unl.pt

Dr. E. Oliveira graduated, in 2006, in Applied Chemistry from FCT- Nova University Lisbon, Portugal, in 2007 obtained a master's in biotechnology and completed a PhD degree in Biotechnology in 2010, at the same University. In 2013, she obtained a second PhD degree in "Food Science and Technology" by the Science Faculty of Ourense Campus at the University of Vigo, Spain. Currently, she is Assistant Researcher at LAQV-REQUIMTE FCT NOVA (Portugal). In 2008, E. Oliveira received the prize in Creativity and Quality in Research Activity in sensors area, attributed by Foundation Calouste Gulbenkian, Portugal and in 2016 she was awarded with the Prize For Women in Science, "Medalhas de Honra L'Oréal Portugal para as Mulheres na Ciência" in the field of health Sciences. Her scientific interests are focused in (i) synthesis of new bio-inspired emissive ligands as fluorescence chemosensors, (ii) supramolecular chemistry (Photophysics and photochemistry), (iii) applications in vitro (solution and solid studies) and in vivo (cell imaging studies); (iv) synthesis of new emissive nanomaterials, as Quantum Dots and Mesoporous Silica nanoparticles for dual drug delivery and biomarker discovery in biological samples, and (v) Antibacterial studies of cargo-delivery mesoporous nanoparticles.

Javier Fernández-Lodeiro

Head of Laboratory for Green Design and Synthesis of Metallic Nanoparticles
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j.lodeiro@fct.unl.pt

Dr. J. Fernández-Lodeiro graduated in 2010, in Inorganic Chemistry from the University of Santiago de Compostela, Spain, in 2011 obtained a master's degree in nanochemistry by the University of Vigo, Spain, and completed a PhD degree in Physical Chemistry in 2012, at the same University. Between 2013-2014, he did a postdoctoral stage at the São Paulo University, Chemistry Department. From 2015 to 2019 he did a second postdoctoral stage at the NOVA University Lisbon, Chemistry Department. Since 2019 have a DL57 contract as Junior Researcher at LAQV-REQUIMTE FCT NOVA (Portugal). In 2012, J. Fernández-Lodeiro received the Extraordinary Doctoral Award Promotion of Physical Chemistry attributed to the best PhD thesys in the field by the University of Vigo, Spain. His scientific interests are focused in (i) development of new green methodologies applied to the synthesis of metallic nanoparticles, specially gold, silver, platinum and paladium, (ii) supramolecular chemistry (Photophysics and photochemistry), (iii) preparation of new bimetallic nanoparticles for catalysis and

antibacterial applications; (iv) synthesis of new emissive nanomaterials, as Quantum Dots and Se, and Te containing nanomaterials, and (v) Antibacterial studies using cargo-delivery mesoporous silver nanoparticles.

Hugo Miguel Santos

Head of the Laboratory for Biological Mass Spectrometry – Isabel Moura - BIOSCOPE Research Group, LAQV-REQUIMTE, Department of Chemistry – NOVA School of Science and Technology, NOVA University Lisbon (Caparica, Portugal)
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HM Santos began his career in Proteomics in 2007, embarking on a joint PhD program in Biochemistry at NOVA University Lisbon (Portugal) and the Turku Centre for Biotechnology (Finland) working with state-of-the-art MS instrumentation for biomedical research. H.M. Santos took up a post-doc at the University of Vigo (2010-12 to 2011-03) followed by a move to the Institute of Biomedicine and Biotechnology (Barcelona, Spain, 2011-04 to 2012-12) to advance biomedical applications of mass spectrometry and translational research. In 2013 H.M. Santos moved to FCT NOVA to continue his research in Biological Mass Spectrometry. Currently, he is Assistant Researcher at LAQV-REQUIMTE FCT NOVA (Portugal). H.M. Santos is Member of the Royal Society of Chemistry. His scientific interests are focused on (i) Identification of molecules involved in complex biological processes, characterize their structure and monitor how their abundance may change during these processes, in order to gain insights into the underlying molecular mechanisms; (ii) nano-proteomics and nano-medicine; (iii) application of chemosensor to the detection/quantification of metals; (iv) Mass spectrometry analysis of organic molecules, metal complexes and supramolecular systems. To date, he has supervised six PhD students to completion and is currently mentoring an additional four.

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PROTEOMASS Scientific Society (Caparica, Portugal)

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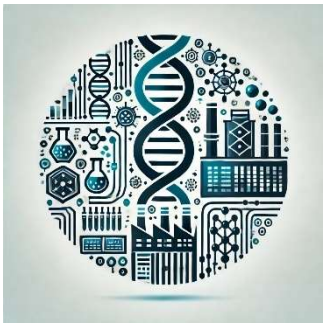

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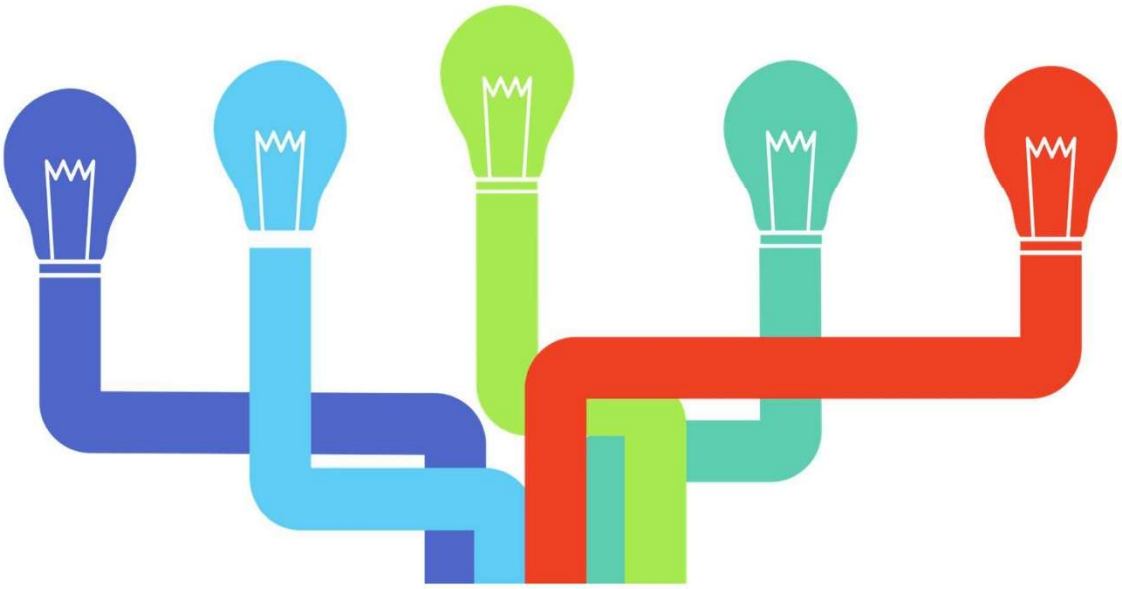

GENERAL INFORMATION

GENERAL INFORMATION

Conference Language

English is the SCIEDU 2025 official language. No simultaneous translation is provided.

Certificate of Attendance

The Certificate of Attendance can be found in the conference pack for all the attendees.

Liability and Insurance

Registration fees do not include insurance coverage for participants regarding personal accidents, illness, cancellations by any party, theft, loss, or damage to personal belongings. The SCIEDU 2025 Conference and the Organizing Secretariat accept no liability for such incidents. Any disputes related to payment and participation will be governed and interpreted per the laws of Portugal. The parties irrevocably submit to the jurisdiction of the courts of Portugal, specifically within the Lisbon metropolitan area, for any disputes or issues arising from or related to participation in the SCIEDU 2025 conference. Cancellations must be made in writing. For cancellations made five months before the conference, 90% of the registration fee will be refunded. After this period, no refunds will be issued. In the event that the conference is cancelled or postponed due to natural causes or any other reasons beyond the control of the Organizing Committee, a voucher will be issued for participation in the next edition of the conference. No refunds will be provided.

Program Changes

Due to circumstances beyond the control of the Organization and SCIEDU 2025, last-minute changes to the programme may be unavoidable. All the information in this program is accurate as of the day of printing (April 28th, 2025).

Disclosure of Information

Proceedings Book is available for download at the conference website https://www.sciedu2025.com
Password for the book of abstracts: **SciEdu25@Caparica**

Privacy Policy

The right to one's image is protected under the Constitution of the Republic of Portugal and by law. Therefore, we kindly ask that you refrain from taking photographs or recording videos of any presentations, individuals, or activities during SCIEDU 2025 without explicit permission from the respective author or subject.

Please Turn off your Phone or to Silent during the Conference Sessions.

No Photography or Videography please without permission of the author during oral or poster presentations.

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TYPE OF PRESENTATIONS

At SCIEDU 2025, plenary lectures, KPRK talks, keynote lectures, oral communications, shotgun communications, shotgun posters, and poster communications will be presented.

Please find important information below and carefully read the information that applies to your presentation mode.

SESSION TYPE	TOTAL LENGHT	PRESENTATION	Q&A
Plenary Lecture (PL)	40 min	30 min	10 min
Keynote Presentations (KN)	20 min.	17 min	3 min
Oral Communications (O)	15 min	12 min	3 min
Shotgun Communication (SG)	5 min.	5 min	n/a

PLENARY LECTURES (PL)

The Plenary Speakers will give **a** 30-minute presentation, followed by 10 minutes of questions and answers (Q&A).

KEYNOTE PRESENTATIONS (KN)

Keynote Speakers will have 17 minutes of presentation, followed by 3 minutes of Q&A.

ORAL ADVANCED COMMUNICATIONS (OA)

Oral communications will be **12 min** of presentation, followed by 3 min of Q&A.

SHOTGUN COMMUNICATION & POSTER (SG)

Shotgun communications will consist of **5 min** presentations (no questions) + a poster (**A0**, which must fit onto an 841 mm wide by 1189 mm long) that will be displayed and discussed during the Chillout Shotgun Poster Session.

The best Posters/Shotgun Posters presented during the conference will be awarded a certificate and a gift from the PROTEOMASS Scientific Society. They will be selected by online voting, and all the conference attendees are allowed to vote one time. Selection criteria will be based on excellent research, innovation, and presentation.

POSTER COMMUNICATIONS (P)

Posters should be **A0** (they must fit onto an 841 mm wide by 1189 mm long poster). During the poster sessions, each author must stand near the poster for Q&A.

The best posters presented during the conference will be awarded a certificate and a gift from the PROTEOMASS Scientific Society. The best posters will be selected by online voting, and all conference attendees are allowed to vote (one vote per attendee). Selection criteria will be based on excellent research, innovation, and presentation.

- All spoken presentations must be uploaded at the registration **desk HALF DAY prior** to the scheduled presentation date.
- The conference rooms will be equipped with **MS PowerPoint 2019** laptops.
- **Using your own laptop is not allowed.**
- **Apple platform is not supported**; ensure your files are PC compatible. Before the start of your session, visit the conference room to check your presentation, familiarize yourself with the audio-visual equipment and meet the chairperson.

MS POWERPOINT PRESENTATIONS SPECIFICATIONS

- Videos and pictures must be in the same folder as the MS PowerPoint presentation. They must be copied into the folder before being inserted into the presentation. Videos included in the presentation shall have the following extensions: ".avi", ".mpeg", ".mov," or ".wmv"
- JPG, GIF, and BMP compressed images are the preferred file format for inserted images (other types of extensions will also be accepted, provide that they are recognized by MS PowerPoint 2019).
- Use Microsoft Windows 10 default system font. Otherwise, please provide a font package for later installation.
- Please use Microsoft PowerPoint 2019 (*.pptx) to guarantee your presentation will open successfully on an on-site PC.
- Presentations must be designed in 16:9 format
- For MAC-Users: Export your Keynote presentation to PowerPoint for Mac or export it to PDF. Be aware of the need to edit/reformat the presentation - fonts, images and charts – especially when exporting to PowerPoint for Mac. For embedded movies, please use the possibility of "Quicktime" to save the movie in "*.mpeg 1(2)" or "*.avi" format.

CONFERENCE VENUE

TRYP Lisboa Caparica Mar

The conference venue, TRYP Lisboa Caparica Mar, is located in a charming village just a short 5-minute drive from Lisbon. It is situated near one of the most beautiful Atlantic beaches in Portugal, offering a perfect blend of convenience and scenic beauty.
https://www.tryplisboacaparica.com

How to reach the hotel Venue

From any place in Lisbon to the Congress Venue (Hotel TRYP LISBOA CAPARICA MAR) a taxi must be taken to the following address:

Avenida General Humberto Delgado, 47
2829-506 Costa da Caparica – Lisbon, Portugal
GPS. **38.641507 [N], -9.236489 [W]**

To ensure your smooth arrival at the conference venue, TRYP Lisboa Caparica Mar Hotel, from Lisbon Airport, we would like to provide you with the following transportation options. Please note that these recommendations have been carefully selected for your convenience:

- Uber Pickup point at Lisbon Airport. The Uber pick-up and drop-off point at Lisbon Airport is at the Departure area in Terminal 1. The Departures area is located on the first floor. After exiting the terminal, cross the street and wait for the Uber driver you requested on your app at the 'kiss & fly' parking lot. If you can't find your driver, contact him or her through the app.

- Taxi: Exiting the airport, you will find a taxi rank where licensed taxis are readily available. We strongly suggest choosing a licensed taxi with a meter to ensure a reliable and efficient journey. The estimated travel time from the airport to the hotel is approximately 20 to 30 minutes, depending on traffic conditions.

- Private Transfer: For a more personalised and comfortable experience, we highly recommend arranging a private transfer in advance. This option guarantees a seamless and stress-free journey directly to the hotel. (Contacts: Ms Isabel Morais ismorais@hotmail.com).

- Car Rental: If you prefer the flexibility of having your own vehicle, you can rent a car at Lisbon Airport. (https://www.aeroportolisboa.pt/en/lis/access-parking/for-your-full-comfort/car-rental). The hotel provides parking facilities for guests.

- Public Transportation: While public transportation is available, it may require multiple transfers and take longer to reach the hotel. However, if you prefer this option, you can take the metro from the airport to a central station, such as Cais do Sodré or Pragal, and then transfer to a bus or taxi for the final leg of the journey to the hotel.

- Avoid the following hours to travel from Lisbon to Caparica (most likely traffic jam): 18-21h
- Avoid the following hours to travel from Caparica to Lisbon (most likely traffic jam): 07-09:30h
- Always ask for a ticket from the taxi driver.

Recommended way to take a TAXI or UBER/BOLT at the Lisbon Airport

1. Before arriving at the airport, Download the App to your smartphone.
2. Call the Car from Airport Departures Zone.

Recommended private transfer for waiting for you at the Lisbon Airport

Ms. Isabel Morais
Tlf: 351 934 640 813
Email: ismorais@hotmail.com
Fixed price: **€**40

LOCAL INFORMATION

Host Capital
Lisbon

Discover the captivating allure of Lisbon, a city steeped in history and cultural richness since its establishment as the Portuguese capital in the mid-13th century. With a Mediterranean climate and a blend of ancient traditions and contemporary lifestyles, Lisbon offers a unique tapestry of character and charm.

According to legend, Lisbon was founded by Ulysses, but historical evidence points to the Phoenicians as its likely founders. The city's name, "Olissipo," derives from the Phoenician words "Aliss Ubbo," meaning "enchanting port," a testament to its captivating maritime heritage.

Lisbon holds a special place among Europe's top tourist destinations and has received numerous accolades over the years. Its timeless allure is complemented by warm hospitality, as locals embrace visitors with a familial embrace.

Prepare to be captivated by Lisbon's intriguing history, delightful cuisine, and the seamless blending of old-world charm and modern vibrancy. Join us on this extraordinary journey and uncover the wonders of Lisbon, a city that invites you to make unforgettable memories.

For more information regarding public transportations, please see:

- Metropolitano de Lisboa: https://www.metrolisbO.Apt/en/
- Carris – Transportes Públicos Lisboa (Bus): http://www.carris.pt/en/home/
- TST – Transportes Sul do Tejo (Bus): https://www.tsuldotejo.pt/?idioma=2
- Trantejo Soflusa (Boat): https://ttsl.pt/
- Fertagus (Train): https://www-fertagus.pt/en

Host city
Almada

As you immerse yourself in the scientific contributions within these pages, we invite you to discover some notable landmarks and destinations in the area. One such emblematic monument is the Santuário do Cristo-Rei, a towering masterpiece located in Almada. Standing at an impressive height of 110 meters, this statue was erected in 1959 and offers a breathtaking panoramic view of the capital city and the picturesque Tagus estuary. Inspired by the Cristo Redentor monument in Rio de Janeiro, the outstretched arms of Christ welcome both tourists and pilgrims alike, leaving an indelible impression.

Venture to the "other side" or the "south bank" of Lisbon, where you'll find the renowned Costa de Caparica. This stretch of coastline has earned a well-deserved reputation as one of the region's most beloved beach destinations. Its golden sands and inviting waters entice visitors seeking relaxation and rejuvenation.

Convento dos Capuchos

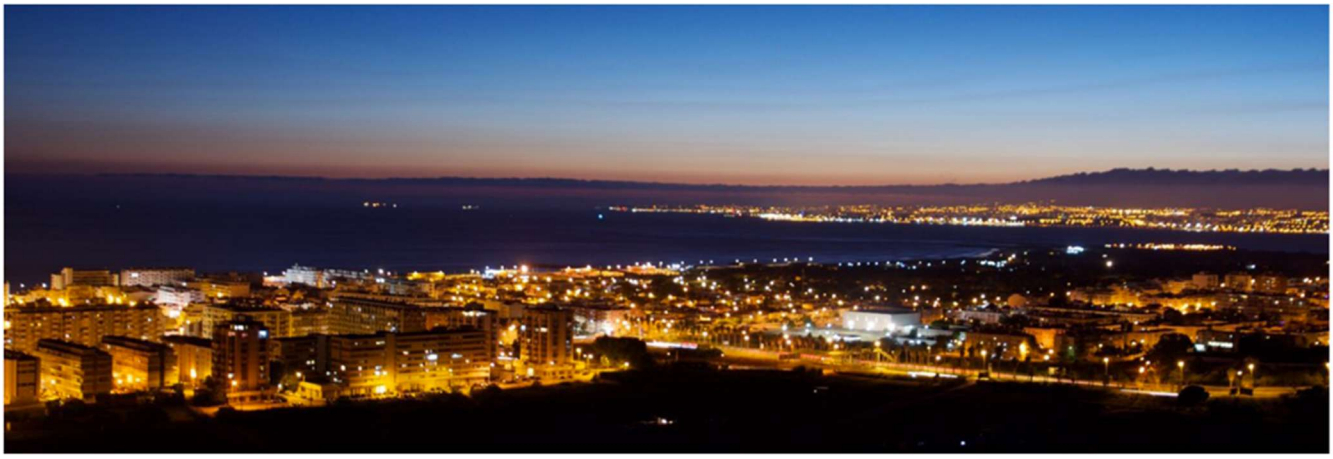
The elegant lines of the Capuchos convent set the point of equilibrium with the magnificent view reached from its viewpoint. Perched in a privileged location overlooking the Atlantic, this serene sanctuary offers an unrivalled panoramic view that stretches from Lisbon to the Serra de Sintra, the Bay of Cascais, the Bugio, the Tower of S. Julião, the Serra da Arrábida, and Cabo Espichel.

Built in the 11th century as a place of worship for the Franciscan Friars, the Capuchos Convent embodies simplicity and austerity, reflecting the principles cherished by its founders. Even after more than 400 years, this sacred site remains steeped in tranquility, providing a haven for meditation and solitude, just as its first inhabitants sought.

Meticulously restored by the Almada Town Hall, the convent seamlessly combines its original charm with modern amenities, creating an ideal cultural space particularly dedicated to music. Surrounded by idyllic gardens and embraced by the serenity of the sea, the Capuchos Convent is a sanctuary that transports visitors away from the bustling city, offering a respite for those seeking solace in heritage and nature.

Whether you love architectural marvels, seek spiritual serenity, or admire natural beauty, a visit to the Capuchos Convent is an absolute must. Immerse yourself in its timeless allure, where history whispers through its halls and the stunning vistas ignite a sense of wonder.

Costa da Caparica



Discover the hidden gem of Costa da Caparica, a dynamic and contemporary coastal town cherished by locals but often overlooked by international tourists. Prepare to be captivated by the awe-inspiring coastline, renowned for its expansive sandy beaches, breathtaking sunsets, invigorating surf, and stunning natural landscapes, all conveniently located within a short 20-minute drive from central Lisbon.

During the summer months, the Portuguese flock to Costa da Caparica, drawn by its inviting beaches, warm and welcoming family atmosphere, and the vibrant beach parties that continue late into the night at the secluded beach bars. It's a place where memories are made, laughter echoes through the air, and the spirit of celebration thrives.

Whether you seek relaxation on pristine shores, the thrill of riding the waves, or a lively beachside soirée, Costa da Caparica offers an unparalleled experience. Embrace the vibrant energy of this coastal paradise, where the fusion of natural beauty, friendly locals, and endless seaside adventures await.

Telecommunications

There are three major mobile telephone operators in Portugal that you can roam with MEO, NOS, and Vodafone. The digital mobile telephone transmission protocols are based on GMS technology, operating at frequencies of 900 and 1800MHz. Please contact your operator provider for further details.

Special numbers:

Lisbon Police: +351 21 765 4242

GNR Costa da Caparica: +351 212 909 340

Cacilhas Fireman: +3551 212 900 030

Lisbon airport: +351 21 8413500, lisbon.airport@ana.pt

SOCIAL PROGRAM

We hope SCIEDU 2025 will be an informative, educational, and enjoyable event. The SCIEDU 2025 Social Events will be a pleasant note in addition to conference sessions offering a great opportunity for networking.

Welcome Dinner

Sunday, May 4th, 2025
Starting at 19:30
Venue: Hotel TRYP Lisboa Caparica Mar – Atlântida Room 8th Floor

Exclusive to all registered conference attendees and their accompanying guests, **registered at the venue with the conference pack**. The primary objective is to create opportunities for meaningful encounters that foster positive relationships between community members.

We want to provide a pleasant reception dinner for all our participants upon their arrival at SCIEDU 2025. The musical performance will be by Boemia do Fado.

Visit to Lisbon Downtown

Tuesday, May 6th, 2025
From 2:30 – 7:30 PM

Open to all registered delegates and accompanying persons. We invite you to find out more during your visit to Lisbon Downtown on Tuesday, May 6th, as scheduled in the programme, following our SCIEDU 2025 recommended tourist spots.

Chillout Shotgun Poster Session

Monday, May 5th, 2025
Starting at 18:30 – 19:30
Venue: Roof - HOTEL TRYP LISBOA CAPARICA MAR

Open to all registered delegates and accompanying persons. You are welcome to participate in the shotgun poster session by enjoying the chillout cocktail on the roof of the hotel venue TRYP LISBOA CAPARICA MAR.

Gala dinner & classical music concert

Tuesday, May 6th, 2024
Starting at 8:30 PM
Venue: Hotel TRYP Lisboa Caparica Mar – Atlântida Room 8th Floor

Exclusive to all registered conference attendees and their accompanying guests, **registered at the venue with the conference pack**. We are pleased to present diverse culinary delights inspired by Almada's rich gastronomic heritage. Nestled in a region blessed with a mild climate, fertile soil, and strong maritime connections, the local cuisine reflects the harmonious fusion of these elements.

Almada's gastronomy is intrinsically tied to the sea and its bountiful offerings. Fresh fish and shellfish abound due to its proximity to the Atlantic Ocean, forming the foundation of many renowned local specialities. Prepare to indulge in the region's flavours, including the delectable Fish Stew crafted with the finest ingredients from the sea. In addition to savouring the culinary delights, we invite you to immerse yourself in a mesmerizing musical performance by a classical Trio of violin, cello and harp. Let the enchanting melodies transport you to a world of harmony and bliss.

Join us as we celebrate Almada's vibrant culinary traditions and artistic talents during this extraordinary event.

Galician Queimada

Tuesday, May 6th, 2025
Starting at 22:30
Venue: Hotel TRYP Lisboa Caparica Mar – Atlântida Room 8th Floor

Open to all registered delegates and accompanying persons. The Queimada is a punch made from Galician *aguardiente* (orujo from Galicia, grappa in Italy, bagaço in Portugal, cachaça in Brazil)—a spirit distilled from the rest of winemaking—and flavoured with special herbs or coffee, plus sugar, lemon peel, orange peel, coffee beans, and cinnamon. It is traditionally prepared in a hollow pumpkin.

Typically, the *queimada* is set alight. While preparing the punch, a spell or incarnation (*concur* in Galician) is recited so that special powers are conferred to the *queimada* and those drinking it.

Professor Lodeiro will prepare the *Galician Queimada* in memory of all his Galician Ancestors.

Drinking together

Tuesday, May 6th, 2024
Starting at 22:30
Venue: Hotel TRYP Lisboa Caparica Mar – Atlântida Room 8th Floor

Feel free to bring a delightful beverage representing your country to share during our convivial gathering after the Gala Dinner. This unique opportunity allows us to engage in lively conversations about our places of birth or current residence, offering a fascinating glimpse into our diverse cultures and backgrounds.

As a tradition, participants often bring renowned beverages from their respective countries. Americans may bring their signature bourbon, Italians share the refreshing taste of limoncello or fine wines, Polish attendees showcase their renowned vodka, and Israeli participants proudly present their exceptional wines. The Chinese community brings the distinctive baiju, while our Japanese friends contribute sake and shochu. The list continues, celebrating the rich tapestry of global flavours and traditions. For those who prefer non-alcoholic options, we welcome an assortment of enticing beverages to suit everyone's preferences. It's during these moments of camaraderie and cultural exchange that lasting memories are made, fostering deeper connections, and creating cherished experiences at SCIEDU 2025.

AWARDS

The Criteria for eligibility will be based on the excellence and originality of the research presented. Selection will be made by online voting during the conference.

Best Shotgun Prizes

The best shotgun communication will be awarded a certification and a gift.

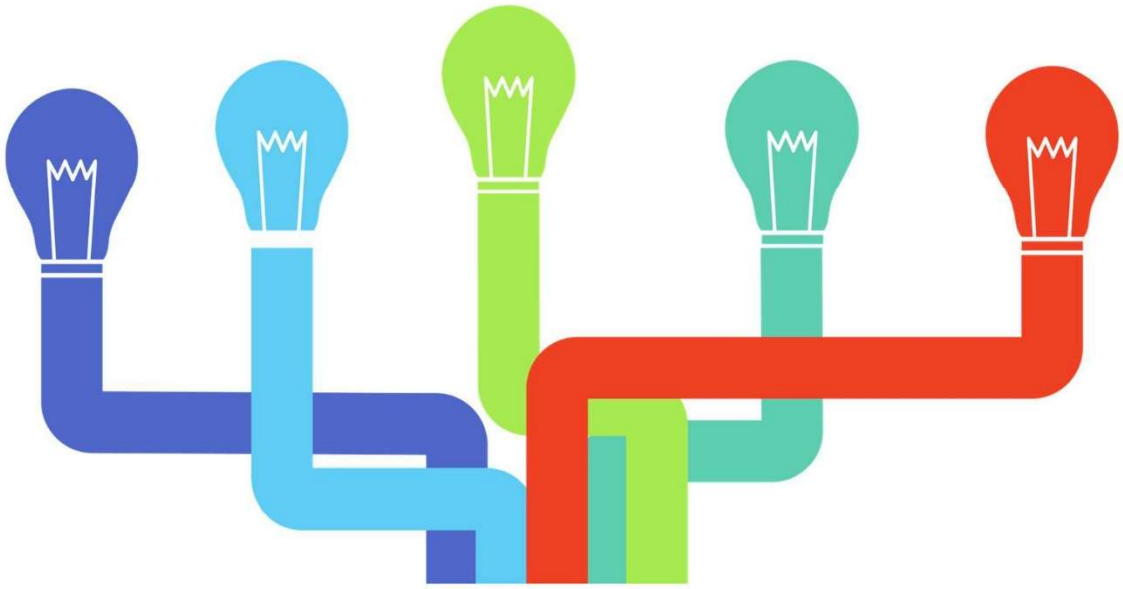
Best Posters Prizes

The best poster presentations will be awarded a certificate and a gift.

1st International Caparica Conference

on Science Education

4th – 7th May 2025 | WWW.SCIEDU2025.COM



BIOSKETCHES

Katia Karadjova, PhD

Katia G. Karadjova - Kozhuharova, PhD, is the Associate Dean of Libraries for Research & Assessment at Georgia Southern University, Statesboro-Savannah, USA. Her doctoral work was on culturally grounded approaches to information literacy understanding to better serve specific groups, countries, and regions. Katia is an active scholar and her areas of scholarly research include: Information Literacy, Mindfulness & Contemplative pedagogy, and international librarianship through the lens of human rights & travel literature. She is also a poet and a fiction writer. Katia has published 15 books, several book chapters, and a number of articles. In her free time Katia enjoys photography, racquet sports, and traveling.

David C. Weindorf, Ph.D., P.G

Dr. David C. Weindorf is Vice President for Research and Economic Development at Georgia Southern University. He earned a B.S. in Range Management, an M.S. in Soil Science (geochemistry minor), and a Ph.D. in Agronomy from Texas Tech. At Central Michigan University, he boosted external grants by 145%, scholarly output by 37%, and impact by 78%, secured Space Grant status, and achieved the university's first QS and Times Higher Education rankings. A Fellow and Presidential Award winner of the Soil Science Society of America and licensed Texas Professional Geoscientist, he has published over 200 papers, led emergency soil assessments for the Deepwater Horizon and Gold King Mine spills (testifying before the U.S. Senate), holds five patents, and executive produced the documentary "Between Earth and Sky – Climate Change on the Last Frontier."

Pier Luigi Gentili, PhD

Pier Luigi Gentili is an Associate Professor of Physical Chemistry at the University of Perugia, Italy, where he earned his PhD in 2004. His research focuses on Complex Systems, and he authored the textbook Untangling Complex Systems (CRC Press, 2018). Gentili has conducted research at institutions including Harvard, Brandeis, and BGSU (USA), as well as labs in Florence, Siena, and Perugia. He has been a Visiting Professor at UCL (UK), Université Paul Sabatier (France), Bielefeld University (Germany), and the University of Malta. He also helped establish an Erasmus agreement between Perugia and Bielefeld. Since 2022, he has ranked among the top 2% of scientists worldwide, as listed by Stanford University. More at: wwwpierluigigentili.com

Emilia Bertolo, PhD

Dr Emilia Bertolo is a Principal Lecturer in Chemistry in the section of Natural and Applied Sciences, Canterbury Christ Church University, where she teaches chemistry-focused modules in various Chemistry and Biological Sciences programmes. Her pedagogical research interests focus on improving the learning experience of chemistry students (especially those in non-chemistry degrees), and the integration of research at all levels into the undergraduate curriculum. She has published several articles and two book chapters on this topic, and presented her work at various international conferences. One of her passions is getting children (especially primary school children) interested in science and chemistry. Emilia is a STEM (Science, Technology Engineering and Maths) ambassador, and has recorded several videos with chemistry and science experiments that can be done at home (her YouTube channel is @dremiliabertolo).

Michele Protti, PhD

Michele Protti is Senior Assistant Professor of Medicinal Chemistry in the Department of Pharmacy and Biotechnology at the University of Bologna, where he conducts research in the Pharmaco-Toxicological Analysis (PTA) Lab. He has authored 83 peer-reviewed articles, six book chapters, and presented more than 160 times at national and international conferences. During his Ph.D. and postdoctoral training, he spent research periods at Charles University in Prague and the University of Ljubljana. He currently leads a research unit on two PRIN 2022 projects funded by the Italian Ministry of University and Research and has contributed to competitive studies with WADA, the Italian Ministry of Health, and Erasmus+. A recipient of multiple best poster awards and travel grants, his work focuses on developing, validating, and applying innovative microsampling and miniaturized sample-preparation protocols coupled to HPLC with medium- and high-resolution mass spectrometry for the quantitation of central nervous system drugs, their metabolites, and related biomarkers.

Stamatios Papadakis, PhD

Dr. Stamatios Papadakis is an Assistant Professor in Educational Technology at the University of Crete. His work focuses on the pedagogical integration of ICT, mobile learning, educational robotics, and computational thinking in early childhood and primary education. He has authored and edited numerous scientific publications and books on EdTech, AI, and STEM education, contributing to Springer, Elsevier, Wiley, and Routledge. He is actively involved in curriculum development and teacher training at the national level and frequently participates in high-level European working groups and editorial boards. His interdisciplinary approach bridges research, policy, and practice in digital education.

Luis Mota-Bravo, PhD

For 25 years, Dr. Luis Mota-Bravo has directed the Minority Science Programs at UC Irvine. He received the Presidential Award for Excellence in Science, Mathematics, and Engineering for creating programs that prepare underrepresented students for biomedical research careers. His mentoring fosters independent thinking, self-efficacy, and a strong scientific identity. He established a lab to engage undergraduates in research early, using coursework-aligned projects that build skills in the scientific process and communication. His work includes functional genomics and environmental bacteria to study antibiotic resistance. Under his leadership, over 260 students have pursued Ph.D.s, including more than 140 trained in his lab. He has received 18 NIH and 4 NSF grants supporting diversity and leadership in science.

Marlene de la Cruz, PhD

For over 27 years, Dr. Marlene de la Cruz has advanced academic excellence and diversity in STEM as NIH Principal Investigator and Director of Student Academic Development for the Minority Science Programs in UC Irvine's School of Biological Sciences. A UC Riverside Biology PhD, she has mentored more than 1,000 underrepresented minority students and received multiple awards for her leadership in inclusion. Under her direction, the MSP earned the White House Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring. She has held leadership roles in Sigma Xi and other scientific organizations, shaping national policies and best practices for inclusive research environments. As PI or Co-PI on four NIH grants managing over $1.5 million annually, Dr. de la Cruz has expanded research training opportunities for URM students. Her work has driven systemic change in academic institutions' approaches to diversity, and through mentorship and visionary leadership she continues to empower future STEM leaders and foster inclusive scientific communities.

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Larry Culliford, MRCPsych

A retired physician and psychiatrist, Dr Larry Culliford is the author of numerous influential journal papers, articles, blog posts, book chapters and books on mental health and wellbeing, focusing on happiness, wisdom and spirituality, details of which are available at www.LDC52.co.uk. He is the co-originator of the non-profit 'World Wide Wave of Wisdom' website (www.wwwow.net) offering advice about personal development towards wisdom and spiritual maturity.

Alice Pereira, PhD

Alice S. Pereira is Associate Professor of Biochemistry and Biophysics at NOVA FCT, Universidade NOVA de Lisboa. She earned her Ph.D. in Inorganic Chemistry in 1995 and completed postdoctoral work in Molecular Biology and Biophysics. Co-leading the Molecular Biophysics group at UCIBIO-i4HB, her research investigates Ferritin family enzymes' catalytic mechanisms, ROS detoxification, supramolecular assembly, protein dynamics, and protein–biomolecule interactions using advanced biophysical and biochemical techniques. Recent studies focus on polymeric supramolecular structures of Ferritin and Encapsulin nanocages for biotechnological applications. Dr. Pereira coordinated the Division of Biochemistry and Biophysics, serves on departmental and master's program committees, and co-creates curricula with students. A co-founder of the (Radiation Biology and Biophysics (RaBBiT) doctoral program, she has mentored over 70 trainees and actively engages in science outreach.

Kara Lanning, PhD

Dr. Kara Lanning is an Assistant Professor in Environmental Studies at Pacific University in Forest Grove, Oregon, where she teaches plant science and sustainability science. Her research focuses on invasive plant pathogens—particularly Phytophthora species—and their ecological impacts in the Pacific Northwest. She mentors undergraduates in field-based, community-engaged research that integrates scientific inquiry with environmental stewardship. Collaborating with local organizations, Dr. Lanning promotes conservation, sustainable practices, and place-based ecological decision making. As an educator, she employs innovative teaching strategies to develop critical thinking and empower students as informed citizens addressing environmental challenges.

Nelson Chibeles-Martins, PhD

Nelson Chibeles-Martins is an Assistant Professor at NOVA FCT since 2005, and a researcher in the Operational Research group at Nova Math. His main research focus is the application of Meta-heuristics on complex and highly combinatorial real industrial and logistics problems.
Additionally, he has been researching in teaching Mathematics to young children through the use of games and hands-on activities and the impact of Soft Skills courses in technology and science students.
He is also a Founding Member of ClubeMath, the NOVA FCT's Maths Club for youngsters and children. Member of the Creation Committee and, for nine years, of the Coordination Team of the "Transversal Competences in Sciences and Technologies" course.
Storyteller, RPG GameMaster and Roleplayer since 1990. Dad since 2003. Alentejano and Nerd.

Ilinca Ciubotariu, PhD

Biosketch available soon

Luca Ferrari, PhD

Luca Ferrari is an Associate Professor of Didactics and Special Pedagogy at the Department of Education Studies (EDU) at the University of Bologna. His research focuses on open education policies and practices, eLearning, pedagogical design enhanced by AI-generated tools for teachers and students, as well as inclusion and digital technologies. He is an executive member of the scientific unit "AI and Education" within the Alma Mater Research Institute for Human-Centred Artificial Intelligence (ALMA HUMAN AI). Active in a variety of international projects in the field of educational technology and innovation, from 2021 to 2024, he has been coordinating the Erasmus+ project Innovative Teaching and Learning Pathways for the Prevention of New Drug Abuse (INES), a three-year initiative.

José Luis Capelo, PhD

Professor J.L. Capelo's scientific journey is marked by a relentless pursuit of understanding complex biological systems and improving diagnostic methodologies through cutting-edge research. Throughout his career, he has been a fervent advocate for interdisciplinary collaboration, working at the intersection of chemistry, biology, technology and medicine. This collaborative approach has not only enriched his research but has also led to the development of practical solutions for pressing health challenges, particularly in the areas of cancer diagnostics, antibiotic resistance and biochemistry analysis.

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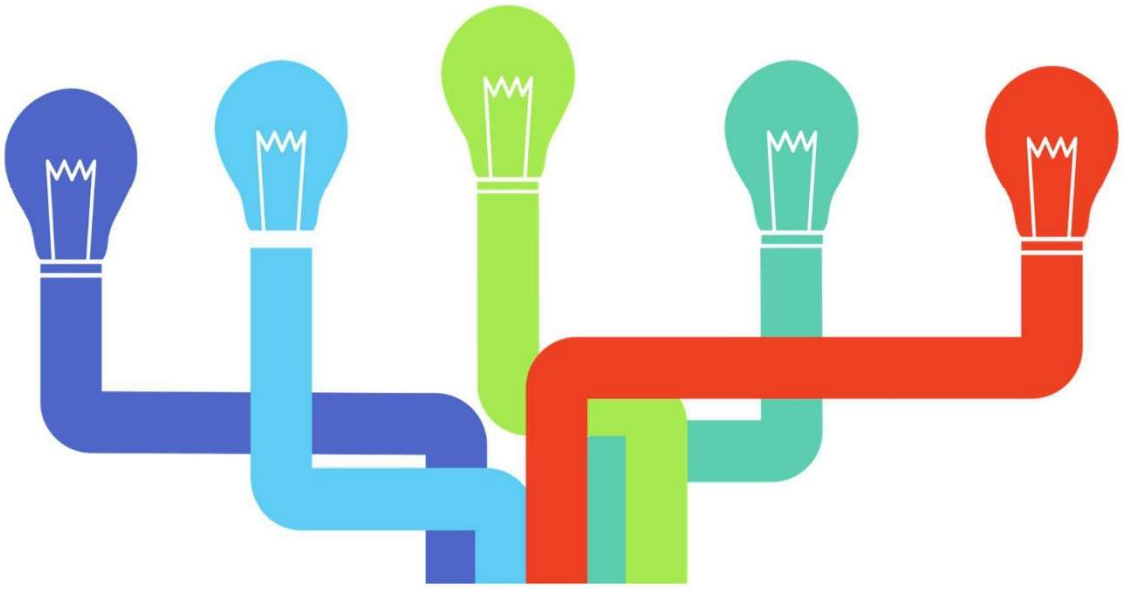
Ana Rita C. Duarte, PhD

Ana Rita C. Duarte is Associate Professor with habilitation in the Chemistry Department at Nova FCT, Universidade NOVA de Lisboa. She earned a BSc in Chemical Engineering (UNL, 2002) and a PhD on supercritical fluid drug delivery systems (UNL, 2006), followed by postdoctoral research at TU Delft. After ten years at UMinho's 3B's group, she led five FCT projects and won the ISASF Best Thesis Award (2007). She secured an ERC Consolidator grant for DES.solve (2016) and two ERC PoC grants for CryoDES (2022) and ImproVITA (2023), co-founded the green-chemicals spin-off Des Solutio (2018), and supervises 2 Master's and 9 PhD students in a 20-member team. With 210 papers, over 9,500 citations, and an h-index of 52, her work advances green solvents such as supercritical fluids and deep eutectic systems.

Laura Mercolini, PhD

Laura Mercolini is Associate Professor of Medicinal Chemistry at the Department of Pharmacy and Biotechnology, University of Bologna. She earned her M.D. in Pharmaceutical Chemistry and Technology and a Ph.D. in Pharmaceutical Sciences, with research fellowships at UC Irvine, the VA Medical Center in Long Beach, and the University of Geneva. Since 2013 she leads the Pharmaco-Toxicological Analysis Research Group (PTA Lab), pioneering microsampling-based bioanalytical methods for drugs, metabolites, biomarkers, illicit substances, and anti-doping tests via miniaturized mass spectrometry. She received the ACS ElSohly Award for cannabis chemistry, directs Bologna's Master's in Forensic Chemical and Toxicological Analysis, and serves as Associate Editor of Medicinal Research Reviews.



PLENARY LECTURES

PL.1 Mindful Leadership: Introducing Mindfulness Practices in Support of Academic Performance and Wellbeing in Higher Education Settings

Katia G. Karadjova-Kozhuharova, PhD

Georgia Southern University, United States
kkaradjova@georgiasouthern.edu

Mindful Leadership as a concept originates frxom the fields of Business and Library Science (Wells, 2022). It encompasses developing the characteristics of a mindful leader, accounting for cultural differences and introducing mindfulness practices and activities at our organizations. Mindfulness and mindful leadership were found to help with optimizing academic performance, preventing burnout, and to have overall positive effects on the wellbeing of students and higher educators. Academic libraries are very well positioned to embrace all the aspects of Mindful Leadership and to foster meaningful innovations in our environments for introducing mindfulness practices and activities to our campus communities.

Nowadays, we live in a very fast-paced society with a lot of distractions and pressing professional burnout. Research shows that our students have to navigate two major factors affecting their academic performance and wellbeing: coping with stress and dealing with distractions while trying to sustain productive cognitive activities. The scholarly literature supports using mindfulness practices to reduce stress and anxiety and help students improve study skills and knowledge retention. The Brain Booth Initiative (https://georgiasouthern.libguides.com/brainbooth) at Georgia Southern University Libraries offers mindfulness practices through *Intentional Brain Breaks,* and activities that support *Emotional Self-Regulation* and foster *Singular Thoughtful Focus*. The Brain Booth is an experiential space to learn about the mind-body connection, reduce stress, and optimize performance. The initiative has a unique flexibility in offering a variety of mindfulness practices and activities at the point of need.

The Mindfulness in Academia research team at Georgia Southern University Libraries has conducted and published research studies confirming the positive effects the Brain Booth activities have on students' academic performance and overall wellbeing as well as on addressing burnout among faculty (Baker & Karadjova-Kozhuharova, 2024; Karadjova-Kozhuharova & Bareford, 2024; Karadjova-Kozhuharova & Baker, 2023; Karadjova, 2019).

This presentation provides an overview of mindful leadership and academic initiatives related to mindfulness practices, and showcases research-proven and replicable methods for enhancing student success, addressing burnout, and optimizing performance across the spectrum of higher education.

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PL.2 How to Prepare the New Generations to Tackle Global Challenges?

Pier Luigi Gentili[1] *

[1] *Department of Chemistry, Biology, and Biotechnology, Università degli Studi di Perugia, Italy.*
* *pierluigi.gentili@unipg.it*

The presence of more than 8 billion people on Earth and their strong interconnections promoted by fast information and communication technologies and means of transport make humanity on Earth a strongly intertwined network. A problem in a community or a sector directly or indirectly regards everyone on Earth. Any local accident or issue can have global repercussions. Therefore, we are spurred to face global challenges [1, 2]. It is compelling to prepare new generations to tackle such global challenges.
A paradigm shift in higher education is required. It is urgent to train not only specialists but also generalists [3] (also said polymath [4] or hybrid figures [5]).
This work proposes a strategy to prepare generalists. It is based on interdisciplinary Complexity Science. The features shared by all those Complex Systems involved in the global challenges, i.e., living beings, ecosystems, urban areas, world economy, and human societies, must be taught. Furthermore, the difficulties in describing and predicting their behaviour should be evidenced. The fundamental thinking skills that the next generalists should have for problem-solving are discussed [6-8]. Generalists are called to integrate the economic, societal, environmental, and ethical dimensions for fully sustainable development [9].

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PL.3 Integrating research experiences into science degrees – Research-Involved-Teaching

Emilia Bertolo

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Science degrees at Canterbury Christ Church University are designed to offer students the opportunity to develop their profile as industry-ready researchers. We believe that the development of a 'students as researchers' ethos helps to enhance their future careers. Research helps foster creativity and critical thinking, and enhances students' capacity for independence; at the same time, it allows them to practise subject-specific knowledge. We have structured our programmes to create a range of opportunities throughout the degree (from Year 1 onwards). This integration of the research process is an integral part of compulsory education as well as outside of it. Our curriculum focuses on research and research-like activities: students move from being recipients of knowledge to collaborators in its production ('students as producers'). Although the literature often refers to this approach as 'research-informed teaching',[1] we prefer to call it 'research-involved teaching'.[2]

The aim of this session is to discuss strategies for developing content with a strong research focus. We will share ways to:

- designing an assessment strategy that encourages research, and
- develop learning activities that integrate research as a fundamental component of the learning process.

Keywords

Research-informed teaching, students as producers, active learning, undergraduate research, inquiry-based learning

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The author would like to thank the amazing team at the Section of Natural and Applied Sciences for their commitment to pedagogic innovation and to research-involved teaching.

PL.4 Training the Next Generation of Diverse Biomedical Research Leaders

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In the United States, African American, Hispanic American, and Native Americans comprise ~39% of the college age population, but earn only ~25% of bachelor's degrees and ~17% of Ph.D. degrees in the life sciences; the percentage of scientist from these underrepresented minority (URM) groups is much lower at the faculty level and awardees of research grants (~8%) from the National Institutes of Health (NIH) [1][2]. A broad participation of undergraduates in biomedical research is critical to ensure that a diverse and highly trained workforce is available to assume leadership roles in the Nation's biomedical research enterprise, and to address the need of improving the health of all the people of the United States. During the past 25 years, we developed institutional programs, funded by competitive NIH grants, to increase the academic excellence and number of URM undergraduates pursuing Ph.D. degrees and careers in biomedical research. The programs continuously adopt innovative approaches, based on the latest best practices and systematic evaluations from current and past trainees, faculty mentors, University administrators, NIH program officers, reviewers of previously submitted NIH proposals, and program directors of other NIH grants. Activities are designed to introduce trainees to biomedical research, improve their academic preparedness and interest in biomedical research with an increasing self-direction. Trainees are introduced to the excitement of generating new biomedical knowledge in a nurturing environment that stimulates their critical thinking skills, self-confidence, self-identity as scientists, with safety, rigorous research design and by conducting biomedical research responsibly, ethically, and with integrity. Sharing their first research experience in a dedicated training laboratory allow trainees to bond, get peer support, develop identity as scientists and gain research experience to become more competitive in vying for sought-after biomedical sciences laboratory positions. Independent research conducted under the direction of faculty mentors at UCI and at partner extramural sites serve as a core element to induce trainees to pursue graduate school and research-focused careers. Over 50 faculty with funded research programs and experience training undergraduates from diverse backgrounds serve as preceptors of trainees. The research training elements are integrated with the undergraduate curriculum and include, 1) individual career and academic advising, 2) a research faculty seminar series, 3) a journal club to introduce scholars to critical reading of current biomedical literature, 4) training in genomics, computational biology, statistics and methods to enhance reproducibility, 5) training in responsible conduct of research, 6) independent research directed by faculty mentors, 7) preparation to present oral presentations and posters at local and national conferences, 8) training in scientific communications, 9) workshops on application to graduate school, and 10) individual advice during the graduate school application process. These programs have provided extraordinary opportunities for undergraduates from diverse groups to be trained as the next generation of leaders in biomedical research.

Keywords
Inclusive education; undergraduate research training; sustained mentoring; integrative STEM education

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PL.5 Integrating generative artificial intelligence in the teaching-learning process. Challenges and limitations from international case studies

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The idea of using digital environments to support educators in design for learning emerged long before the widespread adoption of AI systems. Since the early 2000s, a series of scientific contributions [1] and prototypes of Pedagogical Planners (PPs) have been developed internationally with the aim of enhancing teachers' design competencies through digital technologies (TEL). Considering the characteristics of "first-generation PPs", their adoption in the field education and training (i.e. in school) has largely remained limited to niche experiences. It was only with the mass proliferation of AI across various fields of human experience that a rapid expansion of generative AI tools emerged, aiming to support, facilitate, and optimize teachers' instructional work. These tools assist in differentiated lesson planning, simultaneous problem-solving through interaction with conversational agents, the creation of educational resources and teaching materials, and the development of teaching-learning experiences that promote active student engagement. As a result, PPs have also been influenced by and integrated with AI, opening up new avenues for pedagogical and didactic research. While the limitations of first-generation PPs - such as low adoption rates and rigidity in planning, design, and evaluation - are now partially overcome by AI-driven interaction systems, challenges remain. These AI systems allow teachers not only to dynamically plan their instructional activities but also to engage with them throughout the entire teaching-learning process. However, a critical issue persists: the need for a deeper understanding of AI systems and their integration into daily instructional design to ensure a meaningful impact on teaching quality and teacher well-being [2]. Taking in account the above mentioned scenario, the rapid advancement of generative artificial intelligence (GAI) is transforming the educational landscape, particularly in design for learning and teaching-learning processes. This contribution explores how AI-powered tools, including pedagogical planners, can support (also) university educators and researchers in lesson planning and syllabus design. The scientific reflection first examines the UNESCO frameworks on AI in education [3; 4], highlighting the digital competencies required for educators. It then presents practical applications of prompt engineering to enhance teaching-learning strategies, student engagement and assessment. The analysis includes insights from a professional development initiative where teachers experimented with AI-based. Research findings [5] indicate that while these tools offer valuable support, their effectiveness depends on educators' ability to craft precise prompts and critically evaluate AI-generated outputs. The research underscores the importance of integrating AI literacy into teacher training programs (also at university level) to foster human center design, pedagogically sound and ethically responsible AI adoption in education.

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PL.6 Strategic partnership in higher education: a journey into multidisciplinary, international projects in the field of drug analysis

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Higher education is evolving towards more integrated and interdisciplinary approaches, where collaboration across scientific fields and international partnerships play a crucial role in shaping future research and education [1]. Addressing complex scientific challenges—such as the study of toxic substances, bioactive compounds, and emerging drugs of abuse—requires not only technical expertise but also innovative educational strategies that foster cross-disciplinary knowledge exchange. This plenary lecture explores how strategic partnerships in higher education have contributed to the development of open-access resources, digital learning platforms, and multidisciplinary training models that bridge science and education [2]. Three major Erasmus+ initiatives serve as examples of how multidisciplinary cooperation and international networking can enhance education in drug analysis and related fields: TOX-OER, OEMONOM and INES. TOX-OER has revolutionized toxicology education by integrating open digital learning tools with real-world case studies on toxic compounds and their characterization. OEMONOM has fostered a deeper understanding of naturally occurring bioactive molecules, providing accessible resources on their chemical properties, biological activity, and interactions. INES, tackling the growing issue of New Psychoactive Substances (NPS), has developed innovative teaching strategies that combine scientific methodologies, analytical techniques and prevention-oriented education to better equip students, educators and researchers.

Collectively, these projects illustrate how strategic academic partnerships can drive innovation into scientific education, combining analytical methodologies, digital learning and interdisciplinary collaboration. By leveraging open educational resources, gamification, and data-driven scientific approaches, they create a dynamic and inclusive learning environment that prepares students and professionals for the evolving landscape of bioactive compound analysis and beyond.

This plenary lecture will discuss the broader implications of these projects, emphasizing how international cooperation and forward-thinking educational models contribute to reshaping higher education and research in analytical sciences. Through shared expertise and global connectivity, these initiatives provide a roadmap for a more adaptive, interdisciplinary and impactful scientific education.

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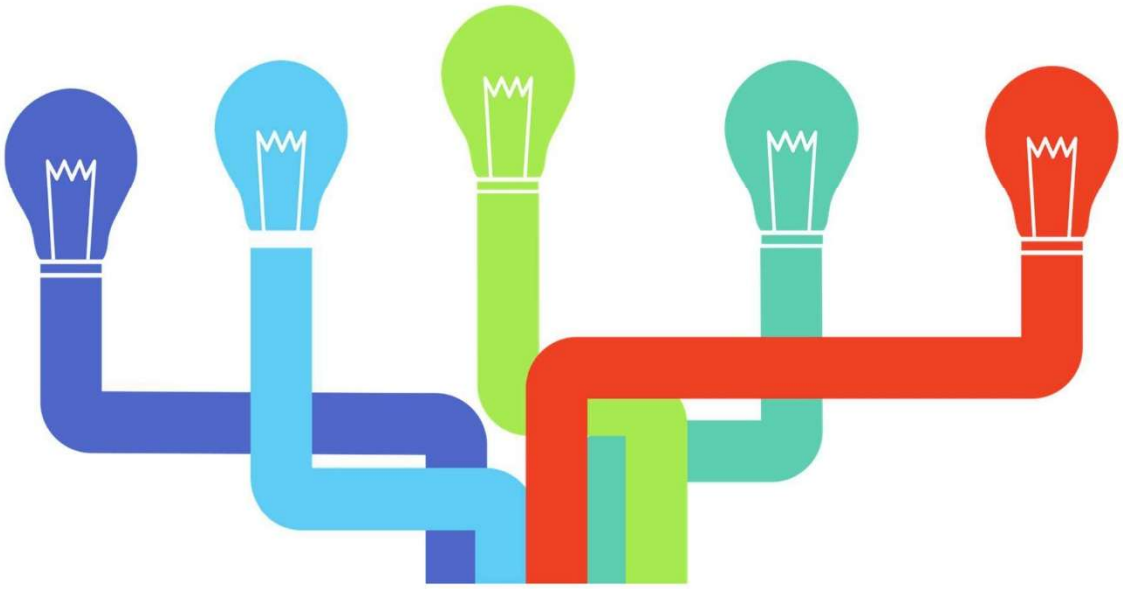
Erasmus+ Programme, key action KA203, Strategic Partnerships, project code 2020-1-CZ01-KA203-078218; Project “Innovative teaching and learning paths for the prevention of new drugs abuse” (INES), Erasmus+ Programme key action KA20-SCH, Cooperation Partnerships in School Education, project code 2021-1-IT02KA220-SCH-000032570.



KEYNOTE PRESENTATIONS

KN.1 Mindful Leadership in the Research Enterprise

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In today's competitive research landscape at institutions of higher education, effective leadership is critical. Even so, there are different types of leaders who leverage unique skills in effective enterprise management. This presentation will explore different types of leaders and their critical skills, through the lens of an academician who rose through the ranks to serve as Vice President for Research and Economic Development at Georgia Southern University (United States). Examples of guiding principles interlaced with personal reflections on motivation will be offered.

Keywords
Leadership; Personality; Motivation; Introspection

KN.2 Lessons from an Erasmus+ project: Learning toxicology through open educational resources

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Toxicology is a multidisciplinary science that plays a crucial role in public health, environmental protection, and regulatory affairs. However, access to standardized, high-quality toxicology education varies widely across institutions and countries. The Erasmus+ TOX-OER project addresses these challenges by developing a Massive Open Online Course (MOOC) that integrates Open Educational Resources (OERs), offering innovative teaching methodologies to enhance toxicology education [1]. The TOX-OER project brings together academic institutions from multiple European countries to create a comprehensive, freely accessible learning platform. The course structure covers a broad range of toxicology-related topics, including exposure assessment, risk evaluation, toxicokinetics and regulatory toxicology. One of its key strengths is the adoption of interactive and student-centered learning approaches, including gamification, case studies and multimedia resources. These tools not only facilitate knowledge acquisition but also encourage active participation, critical thinking and problem-solving skills in toxicology students. A fundamental goal of TOX-OER is to promote inclusivity in education. By offering content in multiple languages and ensuring accessibility for learners from diverse backgrounds, the project aligns with the broader objectives of open science and knowledge democratization. Moreover, the modular format of the MOOC allows flexible learning pathways, making it suitable for students, educators and professionals seeking continuous education in toxicologyrelated fields. In addition to pedagogical innovation, TOX-OER fosters collaboration between toxicology researchers and educators, strengthening the link between scientific advancements and their didactic application. This ensures that course content remains current, relevant and reflective of emerging toxicological challenges. The integration of digital learning strategies, including online assessments and certification mechanisms, enhances the credibility and recognition of toxicology education on a global scale. This presentation will discuss the impact of the TOX-OER project in reshaping toxicology education through the principles of open science and digital learning. By leveraging international cooperation, innovative teaching methodologies, and flexible online learning formats, TOX-OER serves as a model for the future of toxicology education. Its success highlights the potential of MOOCs and OERs in making science education more accessible, engaging, and adaptable to the needs of a rapidly evolving world

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KN.3 Empowering Early Childhood Learning: The Role of Generative AI in Preschool Education

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The integration of Generative Artificial Intelligence (GenAI) in preschool education represents a transformative approach to early childhood learning. This paper explores the potential benefits, challenges, and pedagogical implications of incorporating AI-driven tools in preschool classrooms. By leveraging adaptive learning systems, interactive storytelling, and AI-powered tutors, GenAI can support personalized learning pathways, enhance language development, and foster early computational thinking skills. The study reviews recent advancements in AI-assisted early education, examining case studies where AI-generated content, such as dynamic picture books and interactive voice assistants, enriches the learning experience. However, ethical concerns related to data privacy, screen time management, and teacher readiness pose significant challenges to large-scale implementation. Findings suggest that blended learning approaches, where educators integrate AI while maintaining human interaction, yield the most effective outcomes. The paper concludes with policy recommendations for safe and meaningful AI adoption in early childhood education, emphasizing the need for teacher training, regulatory frameworks, and pedagogically sound AI applications.

Keywords
Generative AI, Early childhood education, AI-assisted learning, Computational Thinking, Adaptive learning,

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KN.4 What to Teach Young People in the Face of Impending Global Catastrophe

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Global warming, eco-destruction and warfare, leading to hardship and the mass displacement of people, are factors representing threats both to humankind, the world's population, and to humanity, to what it essentially means to be human. This paper, addressing the pressing need in consequence to re-evaluate and reframe education, offers timely advice.

KN.5 Activate Learning: Student-Driven Experimental Design in Biochemistry Education

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Traditional laboratory courses often provide students with pre-designed protocols, limiting their engagement with the scientific process. To foster deeper understanding and critical thinking in experimental biochemistry, an innovative approach was implemented in a master's-level Biomolecular Techniques course.

Working collaboratively in small groups, students defined research questions, selected relevant biomolecular techniques (e.g., spectrophotometry, electrophoresis, enzyme assays), and planned and developed detailed experimental procedures. Following each laboratory session, they also engaged in data analysis. A central feature of this approach was the practical execution of their self-designed protocols, allowing each group to demonstrate their understanding of the chosen techniques and their problem-solving abilities. Furthermore, each group presented their experimental design and findings to peers and underwent individual evaluation through face-to-face discussions.

This active learning strategy not only enhanced students' comprehension of core biochemical principles but also cultivated essential skills in experimental design, problem-solving, teamwork, and scientific communication. The experience of independently developing and executing a biochemical experiment/protocol provided a more authentic and engaging learning environment, empowering future biochemists with the practical and intellectual tools needed for scientific inquiry.

Preliminary assessment indicates a significant increase in student confidence and perceived understanding of experimental biochemistry compared to those enrolled in traditional laboratory formats.

Keywords

Student-designed experiments; Active learning; Inquiry-based learning; Biomolecular techniques; Laboratoy pedagogy; Biochemistry education.

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KN.6 Fostering Cognitive Endurance for Transformative Learning in Undergraduate Science Curriculum

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Fostering cognitive endurance in science education is essential for developing resilient, informed scientists capable of navigating the challenges of complex, real-world problems. This presentation explores key ideas from pedagogical research on how science educators can nurture cognitive endurance in the classroom. Highlighted pedagogical methods may lead to deeper engagement, enhanced problem-solving skills, community cohesion, and the ability to persist through failure—a critical component of the scientific process (Anderson, 2011; Richmond, 2021; Hacisalihoglu, 2020). Examples of high-impact educational strategies, such as project-based learning and mentorship, will also be presented to demonstrate how educators can create environments where students feel a sense of ownership and belonging within the scientific community, potentially leading to transformative learning experiences (Kolb, 2014; Kirby, 2021; Mezirow, 2000). Additional literature will be discussed on how community-oriented science classrooms can encourage deep thinking, facilitate the growth of executive functioning, and help students develop critical skills for success in their careers (Ackerman & Kanfer, 2009). By aligning research-based teaching practices with the evolving demands of the scientific landscape, educators can cultivate the next generation of scientists who are not only scientifically skilled, but are also resilient, reflective, and capable of thriving and responding to the ever-evolving demands of scientific pursuits.

Keywords: Cognitive endurance; transformative learning; resilience in science education

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KN.7 Soft Skills in STEM programmes at NOVA FCT– a 13 years old experience

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NOVA School of Sciences and Technology (NOVA FCT) carried out in the academic year 2012/13 a complete revision of their curricula, with the goal of enhancing the training of their students and increase the employability of its graduates. In its new profile NOVA FCT considers three distinct periods, with the introduction of a five-week period in between the two traditional semesters. During this period, several transversal skills courses are taught in intensive regimen.

A mandatory course – CTCT (Transversal Competences in Sciences and Technology) – was created for all first year students. The course has been held every year since its creation. And, because it is mandatory it involves around 1,200 students and a teaching staff of more than 40 members and implies a very demanding organizational support from non-teaching staff. This high involvement of students, teachers, administrative staff and governance organs in the course caused a significative shift in the School's paradigm.

Figure 1. *CTCT Logo*

In this talk the author will present the motivations that led to the creation of the course CTCT and its incorporation in the new curricular profile of NOVA FCT, its main objectives and its syllabus. Additionally, the algorithms used in the allocation of students to classes and groups, teaching practices as well as some indicators of the impact of this new course organization on students' and teachers' attitudes are also explored.

Keywords

NOVA FCT; Academic Curriculum; Soft Skills; Transversal Competences

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KN.8 Building Critical Thinkers in STEM: R³ISE Center's Pedagogy

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As science education evolves to meet the complexities of the 21st century, the R³-Center for Innovation in Science Education (R³ISE) at Johns Hopkins Bloomberg School of Public Health stands at the forefront of transforming how students learn to do, communicate, and critique science [1]. Our mission is to cultivate a new generation of scientists who are not only technically proficient but also develop critical thinking skills, ethical awareness, and the ability to communicate complex concepts effectively [2]. Our distinctive approach is grounded in the 3R norms of good scientific practice—*Rigor, Reproducibility, Responsibility* — and our center develops and delivers innovative teaching methods that combine technical skill-building with philosophical inquiry, data reasoning, and ethical reflection.

For instance, in our "Theory and Practice of Science" course, students explore the philosophical underpinnings of the scientific method and examine how paradigms shift, while asking questions like *What is evidence and what is belief?* These philosophical explorations strengthen scientific training by fostering critical thinking, ethical reasoning, and problem-solving [3].

In our pedagogy, we also confront the reality that science, while powerful, is fallible. In our course "Anatomy of Scientific Error," students investigate how mistakes arise not only from flawed methods, but also from systemic pressures and cognitive biases. Using this unique lens and through real-world case studies of errors across disciplines, learners dissect the structural roots of irreproducibility and explore how communities can work towards rigorous science. We also integrate a framework for science communication, emphasizing transparency, stewardship, openness, honesty, objectivity, fairness, and accountability to encourage students to communicate ethically and responsibly [4].

Our course on "Fundamentals of Quantitative Reasoning in the Biomedical and Health Sciences" guides students to integrate mathematical rigor with narrative clarity. This pedagogical approach presents a model for teaching students to reason with data rather than merely apply formulas—emphasizing interpretation, uncertainty, and real-world relevance [5]. As a follow-up to this course, we also teach "Big Data for Biomedical Scientists," in which we provide an in-depth, enabling exploration of biomedical data science techniques, applied to the lab-research world. We integrate examples from infectious disease research to help build capacities in big data analytics and AI for student trainees.

Beyond our courses, we develop interdisciplinary workshops, hold symposia to provide a platform for our students to share their work, offer training seminars for scientist-educators, and openly share our educational resources. We aim to prepare a new generation of scientists and continue to expand our growing global network and collaborations.

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KN.9 Dr. Vida Education: A Portable, Cost-Effective, LED-Based Device for Protein Quantification in Urine and Food Matrices Using Visible Absorbance.

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Quantifying proteins in complex biological and food matrices is essential for both clinical diagnostics and nutritional analysis. Traditional instrumentation, however, remains costly and often inaccessible in educational or resource-limited environments. The Dr. Vida Education system is a compact, low-cost analytical device capable of measuring visible absorbance, fluorescence, and phosphorescence, providing a versatile platform for real-world applications and teaching.

The device utilizes a modular LED-based optical system, controlled via a dedicated mobile app, allowing for intuitive operation, portability, and real-time data acquisition. In this work, we demonstrate the application of Dr. Vida Education in the quantification of total protein content in urine and selected food samples, using standard colourimetric assays.

Preliminary results show that the system offers sufficient sensitivity and reproducibility for educational and quantitative analytical purposes. Protein concentrations were measured using Bradford based assays, with results comparable to those obtained using conventional spectrophotometers, yet with a significantly lower cost and footprint.

Dr. Vida Education is a promising tool for both teaching analytical chemistry and introducing students to bioanalytical techniques, while also expanding possibilities for field-based screening in public health and food safety contexts.

KN.10 Thermodynamics for chemical engineers – Engaging students through a team-based learning approach

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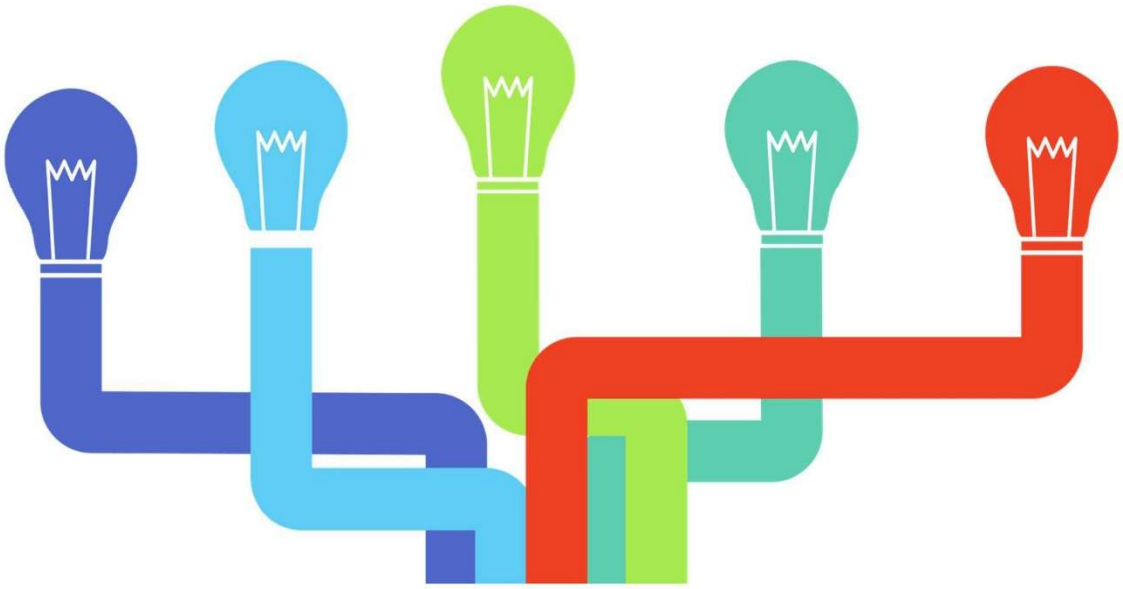
There is no doubt that there is a straight relationship between motivation and learning. We are inherently curious, and since early days in life we are pursuing answers to our questions and start to develop a critical thinking mind. This I believe is the key to facilitate student learning: to arouse curiosity and develop critical thinking. The question is how we actually transpose this to a classroom setting and how can we ensure a successful learning process. In fact, the teaching approach cannot be the same as it was 20 years ago, as millennials, which are now our students, are driven by the concept of learning while doing, expecting regular feedback of their activities, contrarily to older generations that were receptive to conventional learning methodologies, based much more on a theoretical exposition of a subject. The generation gap is a reality and teaching needs to have the flexibility to adapt to these new settings, without losing the coherence between the syllabus and the curricular unit's objectives. The new generation of students aims for dynamic and hands on classes, where the knowledge can be explored and tested. In my perspective, a process in which curiosity over a topic is stimulated and unravelled through a practical approach in which the students are challenged to solve problems and think critically over the subjects they are taught is the way towards a successful learning process. In this communication I will demosntratethe results of changing the teaching methodology from expositive to team-based learning approach and the encouraging outcomes, demonstrated by the survey conducted to both classes.



ORAL COMMUNICATIONS

OA.1 Addressing Burnout in Academia with Mindfulness Practices and Activities: Pilot Study

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Purpose
Workplace burnout is a growing concern in higher education. It negatively affects student outcomes, teacher satisfaction, and teaching quality, often leading to disengagement and attrition [1]. Recent research shows that mindfulness practices can be an effective tool to mitigate burnout in educators [2][3]. This presentation shares the qualitative results of a pilot study which involved eight full-time university faculty members participating in a one-month academic library-hosted mindfulness program addressing burnout-related experiences.
Methods
The methodology included a sequential mixed-methods study. The first part employed a quantitative approach using pre- and post-program Qualtrics surveys assessing six aspects of workplace burnout: exhaustion, cynicism, detachment, ineffectiveness, lack of accomplishment, and stress/anxiety. The second part employed a qualitative approach using focus groups. This presentation reports the results of the qualitative approach. The qualitative data was analyzed to outline initial codes [4]. Themes were then identified and patterns emerged on subsequent reviews of the qualitative data.
Results
Qualitative findings indicated that participants would have benefitted from a detailed introduction to mindfulness concepts, practices, and activities; additional follow-up and encouragement; and an weekly tracking log during the intervention program. The findings further reinforce the positive effect of mindfulness practices for addressing burnout, but indicate the need for a full study. The findings informed necessary changes to the research design that will be applied in a forthcoming full study.
Conclusions
The findings of this pilot study suggest mindfulness practices can positively impact faculty members' experience of aspects of burnout, and support the need for a larger-scale study to further validate them.

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OA.2 Mindful Curriculum Development: the Health Humanities

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This presentation will cover the research and curricular work that went into designing the Health Humanities Minor program at my institution, as well as the related General Education course pathway on the Health Humanities with its multidisciplinary course Health and the Whole Human. Health Humanities refers to the skills and approaches in which humanities disciplines train students that pertain to the health industry, such as empathy, ethics, narrative analysis, cross-cultural communication, analysis from multiple perspectives, and evaluating issues through a disability studies lens. Its purview is broader than its cousin discipline, Medical Humanities. My humanities department decided to create the Health Humanities Minor for several reasons: to accommodate the students who leave STEM majors, to attract nursing students and students in the college of health and human services who want to enhance their skills, to empower the students in our college to be better humans as well as users of and participants in the healthcare industry, and to prepare students for various careers related to the health industry, as the Bureau of Labor Statistics has predicted a strong uptick in demand for those jobs in the next ten years. We also created a General Education course pathway on the Health Humanities, which enables students to take their GE courses along a theme, with a culminating multidisciplinary course Health and the Whole Human, a writing-intensive, research methodologies course on the interdisciplinary health humanities, with particular focus on narrative medicine, humane healthcare, wellness and environment, biomedical ethics, and integrated health sciences.

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OA.3 Mindful Administrative Approaches to Library Resources and Services in Support of Science Education in Higher Education

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Academic libraries support science education by providing access to a vast collection of scientific literature, including peer-reviewed journals, ebooks, and databases. Academic libraries facilitate research by offering specialized science reference services, conducting information literacy workshops tailored to science disciplines, collaborating with faculty on research projects, and even housing specialized equipment or data sets relevant to scientific research. The Georgia Southern University Libraries play a crucial role in supporting scientific research at our institution through a diverse array of specialized services. These include maintaining comprehensive collections of scientific literature, providing access to specialized databases like PubMed and Web of Science, and delivering information literacy instruction tailored to scientific disciplines. Through faculty collaborations, libraries enhance research projects and curriculum development, while specialized reference services offer expert guidance from librarians with subject-specific expertise. Modern libraries also support researchers with data management assistance, technology integration through specialized software access, and promotion of open access initiatives. By creating curated subject guides and offering research data management workshops, libraries serve as essential partners in the scientific research ecosystem, enabling more effective knowledge discovery, evaluation, and dissemination across various scientific fields.

Acknowledgement

I wish to acknowledge my esteemed colleague, Dr. Katia Karadjova, Associate Dean of Libraries for Research and Assessment, for introducing mindful practices to Georgia Southern University Libraries in support of student and faculty success.

OA.4 Mindful Approaches to Student Costs and Engagement

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The high cost of textbooks poses a significant barrier to student success by restricting access to essential learning resources. To mitigate this issue, Georgia Southern University (GaSou) has developed strategies to offer affordable textbook alternatives. These strategies involve synthesizing new content and leveraging free materials from various open ancillary sources and Open Educational Resources (OER) textbooks, all compiled on the Library Guides (LibGuides) platform. Through collaborative efforts, particularly within the chemistry department and supported by various grants, the university has achieved substantial annual savings for students, amounting to thousands of dollars. This talk will detail the process of creating and hosting content through OER LibGuides and will discuss the sustainability and student engagement resulting from these initiatives.

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OA.5 Steam education and the Reggio Emilia Approach

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In early childhood and elementary education, there is a growing need to foster interdisciplinary skills such as creativity, digital literacy, and critical thinking. Educational robotics can play a significant role in this process by offering opportunities for design, construction, and imaginative exploration. The STEAM (Science, Technology, Engineering, Art, and Mathematics) approach provides a paradigm that integrates scientific, digital, and artistic perspectives, helping to address inequalities in STEM (Science, Technology, Engineering, and Mathematics) and STEAM-related fields. Several studies have shown promising results when these fields are combined in educational contexts. By examining the Reggio Emilia Approach, this paper highlights STEAM practices in Reggio Emilia's playful learning environments.

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OA.6 The Next Layer: Towards Open Pedagogy in Data Science and Geospatial Education

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Open-source software and open data are becoming increasingly popular in the teaching and learning of data science and geographic information science. The cost savings that are derived from using free software over proprietary software are one driving factor, yet the move from "closed" to "open" represents much more than financial austerity—it signifies a broader shift in educational philosophy. This presentation will document the gradual transition of an introductory undergraduate course in geographic information systems from an entirely closed course to one that has become increasingly open. Having completely adopted the first three layers of open—software, data, and educational resources—the course is now turning toward the next layer: embracing the philosophy of open pedagogy.

OA.7 Multilingual Communicative Competence: Theoretical and Practical aspects

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More and more often lately, scientists, who are major in Linguodidactics, have shown a significant interest concerning the problem of developing multilingual communicative competence. Teaching several languages mechanisms and, as a result, a multilingual personality formation is one of the most pressing and controversial tasks.

There are different points of view on the concept of a "multilingual personality". Multilingual individuals are often members of more than one language community – generally to different degrees, and the one or ones they orient themselves to at any given moment is reflected in not only which segment of their linguistic knowledge thy select, but also which interaction skills they use, and which features of their cultural knowledge they activate [1]. A multilingual person is an individual familiar with three or more languages to some degree of fluency [2].

When speaking about "didactic multilingualism," following Baryshnikov N.V., we understand the teaching of four or more languages [1]. The multilingual didactics aim is multilingual student's personality formation who has an equal command of four or more foreign languages because of mastering multilingual communicative competence.

Multilingual communicative competence is a complex structure, each component of which has its own substructure, characterized by its own features and functions, as well as strategies for its formation.

The multilingual communicative competence development is the result of organized and targeted teaching process, the success of which is significantly influenced by a correctly constructed sequence of interrelated stages of its components development, the description of which are presented in this report.

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OA.8 The Lost King and the Gut Feelings: The movie clip-methodology for innovative teaching in medical education.

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A film that is based on a real story. Philippa Langley's adventure in the search for the truth about the life and tomb of Richard III. The movie requires, while watching, to observe and to live Philippa's adventure, in a phenomenological experience. Qualified intuition is the resource that veteran doctors use for their decision making, something that is currently called: Gut Feelings. This intuition brings together feelings that are related to the doctor's experience associated with his scientific knowledge and his ability to listen to the patient. This movie experience take us to the core theme of this presentation: the movie clip methodology for innovative teaching in medical education.

Cinema, the audiovisual version of storytelling, is useful in teaching because it is familiar and evocative. Films provide a multilayered nucleus form which significant learning can take place: it also makes available a myriad of scenes and scenarios that can be dissected, critiqued, and used as examples to highlight moral dilemmas. They promote enthusiasm for learning, highlight themes, enhance discussion and reflection and help to illustrate specific teaching points. As the audiovisual resources are permeating our current culture, opportunities for teaching with cinema are well suited to the learners' environment. In this context, it makes sense to use movie clips because of their brevity, rapidity and emotional intensity. Bringing clips from different movies, to illustrate or intensify a particular point fit well with the dynamic and emotional nature of students´ experience stimulating a reflective attitude. Fostering reflection is the main goal in the cinematic teaching set. Reflection is the necessary bridge to move from emotions to behavior. Thus, those "intangibles" topics, difficult to teach and to assess, in which ethics, empathy, and professionalism are included, could be endorsed through the cinema education methodology. The movie clips methodology stimulates a reflective attitude in the learner, helps in building professionalism and open new perspectives in dealing with students' emotions for facilitating the hidden curriculum to promote empathy. The authors have developed Movie Clip Methodology for almost twenty years and want to share with the audience.

References

http://sobramfa.com.br/eng/articles/movies-in-medical-education/

Who should attend?

This interactive workshop is proposed to faculty who deal with ethics, professionalism, communication skills, and patient centered medicine. It will be useful for all those who want to try the cinema clip methodology in their teaching set, since we'll offer the basic rules, and no previous expertise is required.

Intended outcome

Understand the cinema teaching methodology, with special emphasis on the movie clip variation and how to apply in their teaching. Learn how to develop a systematic strategy for preparing movie clips: reviewing movies efficiently, selecting specific scenes, assembling them, becoming familiar with the software resources.

OA.9 What are the most important factors influencing science performance? A machine learning study of Singaporean and Finish PISA data

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Enhancing science achievement is the fundamental goal of science education. Although past studies have identified different factors influencing science achievement, there is still a lack of research to reveal the similarities and differences in the most significant factors influencing students from different cultures. This study adopted a machine learning approach (i.e., random forest regression) to analyse data from Singapore and Finland in PISA 2015 and identified ten top important factors influencing Singaporean and Finnish student science performance. The main findings indicate that (i) learning time, justification in epistemological beliefs, enjoyment, self-efficacy, and ICT use or availability are the top factors of science achievement of both Singaporean and Finnish students; (ii) while three additional individual factors (i.e., expected occupational status, test anxiety and student value cooperation) are among the top factors influencing Finnish students' achievement, three family factors (i.e., family wealth, highest parental occupational status, and home educational resources) are found as top factors influencing Singaporean students' achievement; at (iii) at the school level, teacher fairness is the strongest factor influencing of Finnish students' achievement while the disciplinary climate is the counterpart for Singaporean students. These shared top factors provide a foundation for collaboration between educators and policymakers across cultures, fostering the development of global best practices in science education. Its findings on the context-specific top factors also highlight the need for tailored educational strategies that cater for the cross-cultural difference in science education.

OA.10 STEM for All, STEM by All: Theories and Practice of the SWEETIE STEM learning Platform in Hong Kong

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STEM education has become a focal point in recent curriculum reforms, and engaging all students in STEM learning is a critical issue for the successful implementation of STEM education. Realizing this vision requires tackling challenges at two key levels. The first level concerns the structure of the STEM curriculum, teaching methods, and the design of teaching kits. The second level focuses on teachers' confidence and the need to cater to learning diversity. This speech will briefly outline the experiences of the SWEETIE STEM curriculum in Hong Kong as it addresses these challenges. In response to the first level of challenges, the SWEETIE curriculum draws inspiration from the theory of the Industrial Revolution and organizes STEM activities into four interconnected and progressively learning stages. Additionally, the SWEETIE 7-Step Teaching Pedagogy has been developed by integrating modern educational theories with the unique characteristics of STEM learning to ensure the efficiency of each STEM activity. To further enhance student creativity, the curriculum also features the design of six-dimensionally expandable learning kits. To address the second level of challenges, the SWEETIE curriculum has developed an online learning platform that significantly reduces the difficulty of implementing STEM teaching while better accommodating diverse learning needs. With just two hours of training, teachers can begin teaching STEM effectively. This innovative training approach has been well-received by frontline educators and is currently being implemented in over 60 schools. Finally, we will explore how emerging GenAI technologies can further enhance the efficiency of SWEETIE learning platform, truly realizing the vision of STEM for ALL.

OA.11 Honeybees as bioindicators in environmental monitoring: scientific education through an open online course

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Many university courses have, in addition to the classical form of the lesson in presence, the possibility of using, re-using, re-adapting (enhancing different educational scenarios) the online teaching resources (OERs) [1]. When you see a bee, the first thought is probably to avoid getting stung. Later, you might remember that bees produce precious resources such as honey, royal jelly, propolis and beeswax from many different types of flowers. From an ecological perspective, bees also perform an essential function: that of pollinating fruit crops. If bees were to disappear, we would all be eating a lot less fruit! The BIOAPI course which we developed [1] introduce to another little-known aspect: the role of bees as environmental bioindicators. Bees interact vigorously with the environment in which they live to collect pollen. As a result, they come into contact with pollutant substances that are present in the environment. By analyzing bees and the products of their hives, we can analyze and measure these pollutants [2]. The aim of the course is to illustrate the ethological and morphological idiosyncrasies that make bees a good ecological detector, in a simple but scientifically valid way, and to explore the possible applications of these singular bioindicators. The course has been designed and developed in collaboration with the University of Bologna and the Universidad Nacional del Sur (Bahía Blanca, Argentina) and numerous experts including entomologists, chemists, biologists and educators illustrate how and why bees can act as effective biological indicators, providing information on the chemical contaminations present in the environment in which they – and we – live. The final product of the project is the creation of a short on-line course (microMOOC), with free access, lasting 20 hours (estimated study commitment: 5 hours per week distributed over 4 weeks). The course is in three languages: English, Italian and Spanish. The teaching resources are usable at different levels and in function of a plurality of targets: as simple information materials that can be used individually, for example, by high school students and beekeepers, and was released under creative commons license. The course can be freely enjoyed by choosing the proposed teaching sequence or by selecting the individual "week" of interest. **Week 1:** Introduction and general information about environmental bioindicators. Course presentation. Ecological notes. Ecological surveillance methods. **Week 2:** Environmental bioindicators: characteristics and description. Biological indicators as an ecological surveillance method. Meet the bees. The potential of the bee as a bioindicator. Monitoring networks. **Week 3:** Tracking application with api (I). Reliefs and sampling to analyze. Pesticide analysis in apist matrices. Analysis of heavy metals and PAH in apex matrices. Radioactivity measurements in apist matrices. BIOAPI promotes the sharing of Open Educational Resources (video lessons, case studies, interactive resources, etc.) with a view to supporting lifelong learning and continuing education processes. **Week 4:** Tracking application with bees (II). Bacteriological analysis. Palynological and morphological analysis in apist matrices. Case study. Biomonitoring with bees in Argentina. At the end of each week there is a test, passing it you get a certificate and at the end of the 4 weeks there is a game-test to verify the global knowledge acquired.

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OA.12 Building Competence and Evaluation in Team Science to Meet Scientific Workforce Needs

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Teams have become the normative context for scientific endeavors over the last 25-years. Requisite skills are often considered when scientific inquiry is conducted to ensure the appropriate team members can address a specific problem being solved. Core team science competencies exist far beyond knowledge when teaming. Competencies like facilitating affect, team communication, managing research, collaborative problem-solving, and team leadership can be used both to assess readiness for teaming but also how team members become more competent throughout their life course. Valuation of these competencies continues to be a challenge for evaluators and team leaders. The act of sensemaking allows one to use experience to adjust and change to new environments as needed and it is used a theoretical grounding for change in team members. We offer a novel and alternative multimodal conceptual model for evaluating team science effectiveness represented in these competencies using multiple lenses from the social sciences. Translational scientists create, advance, and translate knowledge as a result of research, learning, and application. Translational teams are composed of dynamic and diverse interprofessional and cross-disciplinary members that generate new knowledge to address a shared translational objective. The objective involves advancing an interventional product, behavioral intervention, or evidence-based approach to improve human health. This paper focuses on identifying individual and team competencies using a modified Delphi method to reach a consensus on the competencies needed by translational teams (TTs).

Effective integration and implementation of knowledge in research are dependent on team science expertise grounded in collaboration principles and techniques that advance individual and group scientific agendas. The Science of Team Science (SciTS) provides evidence-based research and best practices that strive to develop scientists' collaborative skills so that they can work across disciplinary boundaries while developing strong and diverse teaming relationships. Identifying the motivations of those involved in collaborative teaming can contribute to maximizing team effectiveness and applying the knowledge emerging from understanding these to shape teams' adaptation of a shared mutual learning mindset as a core tenet of scientific teamwork. In addition, surfacing motivations has the potential of helping team members examine their own needs in relation to their scientific and career goals. We draw from the domains of the Motivation Assessment for Team, Readiness, Integration, and Collaboration (MATRIC*x*) framework, Maslow's Hierarchy of Needs motivational theory, and The Team Effectiveness Model for Science (TEMS) to develop a Reflective-Reflexive Design Method (R2DM) that focuses on the development of intra-personal attributes within the context of a team. Approaching expertise development from this design method invites individual reflection in the context of group reflexivity to serve as the cornerstone of deep team science expertise. We used a design thinking approach to identify a framework that merges individual reflection with group reflexivity. The core questions we asked are: (i) *What constitutes expertise to succeed in science teams?* and *(ii) How might we approach the design of learning engagements that enable the development of the needed expertise?*

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OA.13 Food Physics Education and the SPICE Lab –A Digestible Approach to Climate Education and Action

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A new, compact laboratory at Appalachian State University in Boone, North Carolina, USA is rethinking the way we teach physics, climate change and student engagement. The SPICE (Sustainable, Physics-Inspired Culinary Education) Lab is an integrated research laboratory and energy data-logging kitchen recording studio. The reserch side of this small but mighty room is a traditional laboratory space for performing faculty-led or student-led research such as the thermodynamics of skillets (2), stock pots and developing educational material to help better connect our food choices to environmental sustainability (3). The other side is a science laboratory disguised as a kitchen. Each piece of equipment and every outlet contains data-gathering equipment and intelligence to allow the user to see real-time power usage either on a screen in the lab or streamed to a eGauge website.

There are four main categories of work that has been explored this year. First, PHY2220 – The Physics of Food and Cooking has been taught in a hybrid nature, part in-person and pary online from SPICE. This has provided a unique pedagogy for physics education which has allowed non-science majors to better understand core science principles throught the familiarity of a kitchen. Second, a campus-wide, voluntary cooking series, Cooking with Purpose, has also been held virtually from this space. This is a cooking series that helps educate students about how to cook healthy, inexpensive, environmentally-friendly foods with unique cooking techniques to reduce energy use and greenhouse gas emissions. Third, our campus television network, AppTV has worked with the SPICE Lab to record cooking demonstrations which highlight the science of food and cooking with an emphasis on sustainability. Fourth, students have used the SPICE Lab to perform their own research. These experiments have been completely designed by the students and run in the lab with the data-logging equipment. This unstructured lab environment breaks the mold on the more structured laboratories and allows students to be truly curious and creative in their science endeavors.

These initial experiences are informing future work from this space, including an IRB-approved study of the pedagogy and its effect on student learning. The hope is that these unique educational opportunities will enable technological and socio-cultural modifications to food choices necessary for planetary sustainability. (3)

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OA.14 Immunology in Practice: a modular framework to support Master of Science students' conference attendance and engagement

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The scientific community offers an authentic environment for emerging professionals to develop knowledge and identity in their field [1]. Conferences, as focal points of disciplinary advancement, provide unique learning opportunities beyond traditional classroom education [2, 3]. We present a modular framework supporting MSc Immunology students at Imperial College London in attending the British Society for Immunology Annual Congress. Evaluation data demonstrates high student satisfaction across content, organisation, teaching, assessment, and community engagement, while identifying areas for enhancement. Our findings emphasise the importance of preconference preparation, academic mentoring, and peer support. Notably, students benefited from experiencing the comprehensive scope of immunology and engaging with established practitioners, contributing significantly to their professional identity formation. This structured approach offers a replicable model for integrating conference participation into higher education curricula.

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OA.15 Empowering the Future: Undergraduate Student STEM Intern Confidence, Hope, and Career Readiness

Tuininga, A.R. [1] *, Murray, M. [1], Spinks, H. [1], Besen-Cassino, Y. [2,] Emery, E. [2], Hannon, M.D. [2], Johnson, B. [3], Nunez Perez, E. [1], Wang, Y. [2], Lopatto, D. [4], Goodey, N.M. [2] , Billings, L. [2]

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Underrepresented students, particularly female and Hispanic individuals, face significant barriers in STEM education, yet little research has explored how intersectional identities influence STEM experiences. The Green Teams Program, a paid, interdisciplinary internship, seeks to bridge this gap by providing an inclusive environment where diverse students develop STEM skills and gain professional experience. Post-program assessments, including statistical analyses, revealed that Hispanic and female participants reported significantly higher learning gains, resilience, and self-confidence compared to their counterparts. Additionally, the program fosters hope, agency, and self-clarity through structured mentorship, interdisciplinary collaboration, and psychoeducational support. Results from the Hope Action Inventory indicate that students leave with an enhanced ability to translate hope into tangible career steps. These findings suggest that paid experiential learning opportunities with diverse peers and intentional mentoring not only empower underrepresented students in STEM but also equip all participants with the confidence and skills needed to tackle global environmental challenges. By providing a structured, inclusive, and interdisciplinary learning experience, the Green Teams Program serves as a model for strengthening STEM education and preparing young professionals for meaningful societal impact.

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OA.16 Unraveling Self-Efficacy of incoming medical students: Insights of a Medical School in a developing country

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Self-efficacy [1], based on Albert Bandura's Social Cognitive Theory [2], is a determining factor for academic and professional success, especially in demanding courses such as medicine. In developing countries, where resources are scarce, belief in one's own ability becomes even more relevant. This study investigates the relationship between self-efficacy and socioeconomic factors among medical students in a university in Brazil. The main objective was to analyze the self-efficacy levels of incoming medical students and their association with socioeconomic factors and consider these results to determine possible interventions to increase self-efficacy levels, equalizing as much as possible, considering the socioeconomic factors that may interfere with the self-efficacy of the newcomers in a Medical School in Brazil.

This is a cross-sectional study conducted with 167 first-year medical students from a Brazilian public university. Participants answered the Sociodemographic and Professional Questionnaire (SPVQ) and the Higher Education Self-Efficacy Scale (HESES) [3]. Data collection was performed via electronic form, ensuring the anonymity of participants. Data were analyzed using IBM-SPSS Statistics version 29 and R software [4].

The sample showed a predominance of women (51.50%) and students aged 20 or younger (56.02%). Self-efficacy levels ranged from moderate to high, with averages between 7.79 and 8.47 on a 10-point scale. Significant associations were found between self-efficacy and factors such as family income, time since high school graduation, admission to college, employment status, and source of financing for studies. Students from families with higher incomes, who had recently completed high school, were accepted in the first admission to college, were unemployed, and received financing from their families demonstrated greater self-efficacy.

The results suggest that socioeconomic factors influence medical students' self-efficacy, impacting their confidence in learning and academic performance. Implementing supportive policies and curricular adaptations may contribute to promoting greater equity and academic success among students from different socioeconomic backgrounds.

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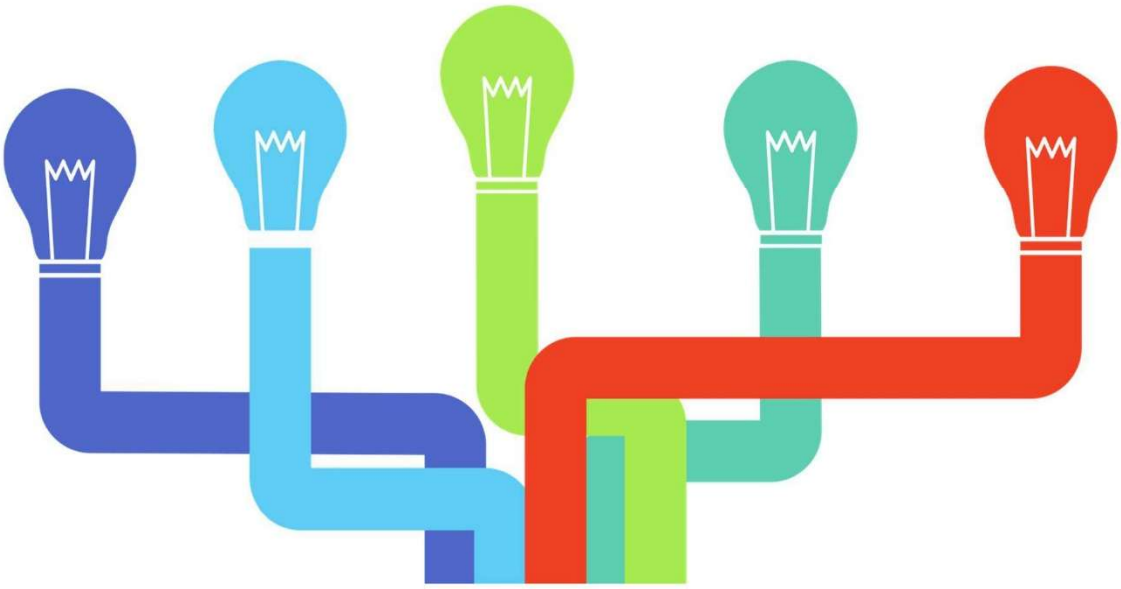

SHOTGUN COMMUNICATIONS

SG.1 Utilizing WRAPS for Undergraduate Students

McKinzie Green[1] *, Wintana Bekele[2], Keion Liburd[3], Shainaz Landge[4]

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WRAPS (Writing Research Articles as Proficient Scholars) project functions to make writing peer-reviewed articles an easier process. It focuses on empowering student scholars in scientific writing with its adaptable structure making it a valuable tool. WRAPS addresses challenges students face when reviewing and writing research articles by bridging the barriers between student and peer-reviewed research articles.[1]

The WRAPS workbook is strategically planned and arranged for 15 weeks (one semester). By the end of the semester, students will have produced the first draft of a scholarly research article. Students will have also gained soft skills that will be necessary for them outside of writing scholarly articles. This structure ensures students remain on track while still mastering the skills required for academic writing. The scholars are provided with weekly worksheets in a step-by-step manner to achieve specific goals. These goals include creating publication-ready figures for their article and reading through research articles efficiently.[2] Additionally, students are taught how to professionally write an abstract, conclusion, and bibliography.

Beyond the technical skills required for writing, WRAPS fosters the development of other skills necessary for long-term success. These skills include time management, discipline, self-awareness, communication, teamwork, and adaptability skills.

The ultimate goal of WRAPS is to build students' confidence, self-efficacy, and proficiency in scholarly writing while exposing them to the academic research writing process. This model offers a replicable framework for other institutions and programs as well to reach a broader audience.

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SG.2 A Teacher Training Proposal for the Integration of Artificial Intelligence in Primary and Secondary Education – A Systematic Review

Spyridon Aravantinos[1], Stavros Athanassopoulos[2] *, Andromahi Filippidi[1], Konstantinos Lavidas[1], Vassilis Komis[1], Stamatios Papadakis[3]

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Artificial Intelligence (AI) is rapidly expanding into various aspects of everyday life, significantly impacting education. AI can be utilized to enhance learning outcomes and improve teachers' productivity, making the transformation of teaching and learning methods necessary [1]. Global and European institutional bodies have attempted to define the framework for introducing AI into education and to argue for the safe and ethical use of AI-integrated tools [2], [3].

In this context, the Greek Ministry of Interior has also drafted a guide for integrating AI across all state structures and institutions (Advisory Committee on Artificial Intelligence, 2024), including all levels of education. With numerous AI-powered tools available for free use, the creation of educational material can be facilitated, and teachers' work can be supported. Therefore, AI can be incorporated into open educational resources. Given the rapid advancement of AI tools and students' increasing daily exposure to them in various forms, teachers must update their knowledge, develop the necessary skills, and adapt to this new reality [4]. However, despite the benefits provided by these new capabilities and the promotion of innovative teaching practices, AI is often demonized, as its proper or improper use remains a source of concern, insecurity, and challenges [5].

The aim of our research is to propose a training framework for teachers to support them in integrating AI into their teaching practices and enhancing their ability to utilize it effectively. To achieve this, we sought to identify research findings at an international level regarding how AI is integrated into educational environments, the objectives it serves, and the tools used in relation to different subject areas. Specifically, we examined the perceptions of primary and secondary education teachers regarding AI-related practices, the benefits they gain, and the challenges they face.

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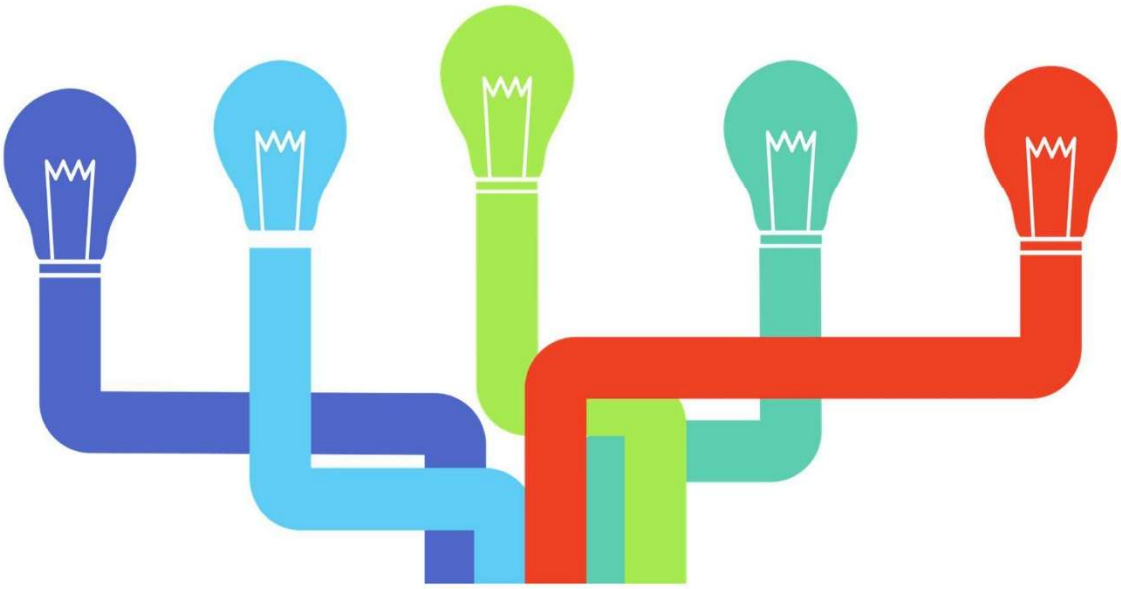

POSTER COMMUNICATIONS

P.1 STEM Identity: Empowering Students to Succeed in STEM Spaces

Murray, M. [1]*, Spinks, H. [1], Besen-Cassino, Y. [2], Emery, E. [2], Hannon, M.D. [2], Johnson, B. [3], Nunez Perez, E. [1], Wang, Y. [2], Lopatto, D. [4], Goodey, N.M. [2], Billings, L. [2], Tuininga, A.R. [1]

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STEM identity and believing in one's abilities is a vital aspect for STEM and Non-STEM students alike to advance in STEM and STEM-adjacent careers. Previous research has found that students from backgrounds historically underrepresented in STEM have reported lacking a sense of belonging and abilities in STEM fields. The Green Teams Program is a paid, interdisciplinary, team-based experiential learning and internship initiative, that aims to give undergraduate students the skills and confidence needed to engage in STEM spaces and pursue STEM careers. Through subject-expert technical and professional training, wrap-around services such as housing and psychoeducational group counseling, and real-world experience, students gain confidence in exploring STEM spaces. From the Survey of Undergraduate Research Experiences, Female and Hispanic participants reported in post-program assessment significantly higher learning gains in "Self confidence" and "Becoming part of a learning community". Results from the Hope Action Inventory surveys administered post-program further indicate significant increases for female and Hispanic participants' responses in: hope, self clarity, and visioning. Results suggest that the Green Teams Program allows students historically underrepresented in STEM to experience a sense of community and belonging, believe in their abilities, and envision themselves in a successful STEM career.

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P.2 Dr. Vida Education: A Compact and Cost-effective Device for Teaching Protein Quantification using the Bradford Assay

André Q. Figueiredo[1,2], Inês F. Domingos[1,2], ,José L. Capelo[1,2] Carlos Lodeiro[1,2], Hugo M. Santos[1,2,3]

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Spectrophotometric protein quantification is a foundational technique in biochemistry education, and empowering students to perform such analyses independently enhances both conceptual understanding and engagement. The Doctor Vida Education platform, a compact, LED-based analytical device that offers the capability to measure visible absorbance, fluorescence, and chemiluminescence, making it highly suitable for use in teaching laboratories. In this study, we demonstrate its application in total protein quantification using the Bradford assay [1], a widely adopted colorimetric method based on the absorbance shift of Coomassie Brilliant Blue dye upon protein binding. Doctor Vida Education enables students to monitor absorbance at 595 nm with robust accuracy and reproducibility. The device can be operated via a dedicated smartphone app or directly on the unit, allowing for intuitive sample handling, real-time data visualization, and analysis, all without the need for complex or expensive laboratory equipment. Its design supports use by individual students or small working groups, promoting accessibility, autonomy, and deeper experimental engagement in educational settings. By combining affordability, portability, and methodological relevance, Doctor Vida Education offers a practical and innovative solution for bridging theoretical learning and hands-on practice in undergraduate and secondary science curricula.

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P.3 Mindfulness Activities in Support of Student Success

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Introduction: Mindfulness practices and activities have been used in academia to support student success and overall well-being (Egan et al., 2022; Baker & Karadjova-Kozhuharova, 2023; Karadjova-Kozhuharova & Baker, 2023). The Brain Booth Initiative provides activities that assist students with developing coping skills to manage stress and anxiety, foster singular thoughtful focus, and support emotional self-regulation. The Brain Booth is an experiential space to learn about the mind-body connection, reduce stress, optimize learning, and support overall well-being. Mindfulness activities include coloring, origami, puzzles, biofeedback, meditation, board games, and more.

Methodology: A qualitative study was conducted using student feedback on interactions with Brain Booth mindfulness activities, with a research question: What mindfulness practices and activities were considered most helpful to students and why? The study data were collected from student responses at electronic kiosks at the Brain Booth locations.

Results: The findings of the study showed that specific Brain Booth activities were consistently related to helping students relax and de-stress.

Conclusion: Providing a variety of mindfulness activities is very important for addressing the needs of different individuals. Researchers will continue to study student interactions with Brain Booth mindfulness activities, expanding and enhancing activities available to students, with the goal of helping to improve their academic performance and overall well-being.

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P.4 Doctor Vida: A Cost-Effective, User-Friendly Tool to Enhance Hands-On Learning in Science Education.

Inês F. Domingos[1,2] ,André Q. Figueiredo[1,2], José L. Capelo[1,2] ,Carlos Lodeiro[1,2], Hugo M. Santos[1,2,3]

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Modern science education increasingly demands accessible, multifunctional analytical tools that support hands-on learning, especially in resource-limited laboratory settings. The Doctor Vida Education platform meets this need with a compact, LED-based device capable of performing visible absorbance, fluorescence, and chemiluminescence measurements with impressive efficiency. Operable via a dedicated smartphone app or directly on the device, it offers intuitive control and real-time data acquisition, making it suitable for both guided instruction and student-led exploration. In this study, we demonstrate an application in which Doctor Vida produces results that are comparable to those obtained with high-end laboratory equipment in total protein quantification using the Bradford assay[1]. Its versatility and cost-effectiveness make it a powerful tool for democratizing access to optical measurements, thereby enhancing experimental training across chemistry, biology, and materials science curricula. Designed for individual students or small working groups, the platform promotes interactivity and personalized learning. The modular optical setup is tailored for educational use but is also robust enough to serve as an introductory tool for early-stage research and screening applications.

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AUTHOR INDEX