

# LEARNING INNOVATIONS SUMMIT~2024



## UNVEILING THE FUTURE OF LEARNING & ARTIFICIAL INTELLIGENCE

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## Plenary talks

Friday 13<sup>th</sup> September, 09.30-09.45

### Policy in focus: European Education and Training in the Age of AI

Mrs. Simona Petkova

Policy Officer at the European Commission

Exploring the European Commission's forward-looking vision and initiatives, this presentation delves into the transformative impact of AI on education and training systems. Mrs. Petkova will highlight strategies for ethical adaptation and resilience in the face of AI-driven changes and offer valuable insights into EU policies, action plans, and funding programs shaping a high-quality, inclusive digital transformation across the Union and its member states.

Friday 13<sup>th</sup> September, 09.45-10.10

### Navigating the AI and XR opportunities for Education: Case studies and Critical Perspectives

Dr. Eleni Mangina

Professor at the School of Computer Science, University College Dublin and Vice Principal (International) for the College of Science

Showcasing real-world case studies, Dr. Mangina will explore the transformative impact of AI and Extended Reality on education, demonstrating how these technologies are integrated into various educational settings. By addressing both successes and challenges, the speech will critically examine the ethical and practical considerations of AI and XR, offering educators valuable insights on leveraging these innovations to enhance teaching and learning globally.

Saturday 14<sup>th</sup> September, 09.00-09.30

### Reality-embedded learning with AI and XR

Dr. Fridolin Wild

Professor at the Institute of Educational Technology of the Open University of the United Kingdom

AI and XR have rapidly become mainstream, transforming education by integrating digital tools into everyday life. While AI-powered services and XR enhance learning environments, issues like digital inequality and limited access to smart devices persist. Dr. Wild will review recent advancements in embedded learning and human-computer interaction, showcasing research from the Performance Augmentation Lab at The Open University. He highlights challenges and future opportunities, including the upcoming launch of new XR studios in March 2025, supported by a £5.8m investment aimed at enriching course production.

Saturday 14<sup>th</sup> September, 10.15-11.30

## The Global Adolescent Mental Health Crisis: The Role of Digital Health Games in Closing the Gap

Dr. Lynn Fiellin

Professor of Biomedical Data Science at Dartmouth College

Approximately 15% of the world's adolescents—195 million young people—struggle with mental health conditions, many of which begin before age 14 and often go undetected. This often-overlooked crisis is further exacerbated by social media and challenges like COVID-19. In her speech, Dr. Fiellin will offer invaluable insights into the current state of adolescent mental health and highlight the transformative potential of digital technologies in supporting young people. Drawing from the impactful work of the play2PREVENT Lab at Dartmouth College, she will showcase how using digital health games offers scalable solutions that improve mental wellness and outcomes on a global scale.

## Panel discussions

Friday 13<sup>th</sup> September, 10.10-11.00

### The Path Towards a Just and Ethical Use of AI and XR in Education

#### Panelists

- Dr. Eleni Mangina, Professor at the School of Computer Science, University College Dublin and Vice Principal (International) for the College of Science
- Dr. Jahna Otterbacher, Associate Professor and Dean of the School of Pure and Applied Sciences at the Open University of Cyprus
- Dr. Demetris Trihinas, Assistant Professor at the University of Nicosia

Facilitator: Dr. Michalinos Zembylas, Professor of Educational Theory and Curriculum Studies at the Open University Cyprus

The panel will explore AI and XR's ethical and social justice implications in education and society, providing diverse perspectives on how these technologies can perpetuate or reduce social inequalities. Experts will discuss the challenges and responsibilities associated with their deployment, emphasizing the role of stakeholders and focusing on issues of fairness, transparency, and equitable access.

#### Key questions to be addressed:

- How can we ensure that AI and XR systems are designed and implemented with fairness and transparency?
- What are the risks of AI and XR technologies perpetuating existing social inequalities, and how can these be mitigated?
- How can AI and XR be used to promote social justice and equitable access to resources?
- What responsibilities do stakeholders (governments, developers, educators) have in ensuring ethical AI and XR practices?

Friday 13<sup>th</sup> September, 14.00-15.30

### Riding the wave - How academia and industry incorporate and foster the development of AI, XR, and digital skills

#### Panelists

- Mr. Demetris Skourides, Chief Scientist of the Republic of Cyprus
- Dr. Marios Avraamides, Professor of Cognitive Psychology at the University of Cyprus, Pillar Leader of Human Factors & Design at CYENS Nicosia
- Panayiotis Thrasyvoulou, Partner & Head of People Advisory Services at EY Cyprus
- Dr. Efi Nisiforou, Assistant Professor in Distance Education at the University of Nicosia

Facilitator: Dr. Jahna Otterbacher, Associate Professor and Dean of the School of Pure and Applied Sciences at the Open University of Cyprus



The panel discussion will explore the synergy and collaborative potential between academia, research, and industry in advancing AI, XR, and digital skills in education and training. It will also delve into the challenges and benefits of adapting learning and development to the rapidly evolving educational technology landscape, focusing on effective approaches to empower academics, educators, learners, institutions, and professionals.

Key questions to be addressed:

- How will AI and XR reshape education and training?
- How is the digital landscape reshaping the realities and priorities in learning and development?
- What collaborative strategies can academic institutions and the private sector adopt to drive innovation?
- What is the potential for deeper collaboration between academia and the private sector?

Saturday 14<sup>th</sup> September, 09.30-10.15

### Teachers and Students in the AI Era

Panelists

- Dr. Fridolin Wild, Professor at the Institute of Educational Technology of the Open University of the UK
- Lucy Avraamidou, Professor and the Director of the Center for Learning and Teaching at the University of Groningen
- Dr. Elena Hadjikakou, Director of the Cyprus Pedagogical Institute of the Ministry of Education, Sport and Youth

Facilitator: Dr. Charalambos Vrasidas, Executive Director of CARDET, Professor of Learning Innovations and Policy at the University of Nicosia

The panel discussion will explore the integration of AI in education, focusing on how teachers and students are navigating, adopting, and adapting AI tools in the classroom. The speakers will share their insights and examine transformative potential, how AI is reshaping educational practices, and what this means for the future of education.

Key questions to be addressed:

- How is AI transforming traditional teaching methods and student learning experiences?
- What are the key challenges teachers and learners face in adopting AI tools?
- How can educators be better supported in integrating AI into their teaching practices?



Saturday 14<sup>th</sup> September, 10:40 - 11:30

## Diverse Insights and Perspectives on Digital Mental Health

Panelists:

- Dr. Lynn Fiellin, Professor of Biomedical Data Science at Dartmouth College
- Dr. Alexandros Tifas, Mental Health Nursing Officer and Certified Drug Addiction Counselor (IC&RC/AODA) at the Mental Health Nursing Services Administration of the Ministry of Health, Cyprus
- Anahit Minassian, Youth Mental Health Technical Support Coordinator at UNICEF
- Dr. Charalambos Vrasidas, Executive Director of CARDET, Professor of Learning Innovations and Policy at the University of Nicosia

Facilitator: Dr. Tassos Kyriakides, Assistant Professor at the Yale School of Public Health, Head of Data Science at CARDET

The panel will explore the role of digital technologies in addressing the global mental health crisis. Featuring representatives from the Ministry of Health, UNICEF, CARDET, YALE, and Dartmouth College, the discussion will examine the effectiveness, challenges, and ethical considerations of digital tools in supporting mental health provision. Panelists will share their experiences and perspectives on the impact of these tools across different regions and populations, offering a comprehensive view of the potential and limitations of digital mental health initiatives.

Key questions to be addressed:

- How can digital health games be effectively scaled to address adolescent mental health needs globally?
- What ethical considerations must be addressed when deploying digital mental health tools, especially in vulnerable populations?
- How do cultural and regional differences impact the adoption and effectiveness of digital mental health solutions?
- What role should governments, NGOs, and international organizations play in supporting digital mental health initiatives?

## Workshops

Saturday 14<sup>th</sup> September, 11.45-13.00

### Workshop 1. Digital and augmented reality applications in STEAM education

Dr. Xanthia Aristidou  
Senior Researcher/Project Manager, CARDET

The workshop will equip teachers with a toolkit developed to support talented students, not only those aged 8-18, in STEAM education using the 'Learning by Design' Approach. This toolkit was developed within the Erasmus+ project GIFTLED, which aims to develop innovative methods and approaches for including talented students in STEAM education using digital and augmented reality (AR) tools.

Participants will gain hands-on experience and insights into the following components:

- **The Teacher's Handbook provides** advanced methodologies and strategies for STEAM education and suggests using AR and digital design tools to increase learners' engagement.
- **Zappara Application:** participants will be able to discover the potential of AR in education through case studies demonstrating innovative interactive learning approaches.
- **The e-learning Platform** provides teachers with access to raw resources and materials that they can modify and easily adapt to their students' learning needs and interests.
- **Curriculum:** Participants will be able to explore how to use the "Learning by Design" method in STEAM education using digital and AR tools, exploring modules that focus on the STEAM areas.

**Equipment needed by the participants:** Participants are required to bring their own device (phone or tablet).

### Workshop 2. MetaCivicEdu - Teachers' workshop on metaverse and learning design

Dr. Eleni Mangina  
Professor at the School of Computer Science, University College Dublin

This teachers' workshop on Metaverse and Learning Scenarios is part of the first European initiative about the metaverse use in civic education for primary school-aged children (MetaCivicEdu Erasmus+ project). Teachers will be provided with training material on metaverse features and the design of learning scenarios that will use metaverse/XR in civic education. The aim is to engage teachers and empower them to create metaverse-enriched learning scenarios for civic education in primary schools. As a result, it contributes to the digital transformation of teachers by providing them with technical and pedagogical training, support, and guidance by instructional designers and educational technologies, as well as material for creating engaging metaverse-enriched learning scenarios. It also supports teachers in enhancing their education by implementing metaverse-based scenarios in their pedagogical practice for civic education. Currently, there is a need for the availability of metaverse learning scenarios, which teachers can utilize. This will positively affect their digital readiness and capacity and support innovative learning and teaching practices.

The workshop aims to support teachers in designing engaging learning scenarios for civic education that will benefit from the affordances of metaverse and extended reality (XR). Metaverse-enabled extended reality (XR) can be a powerful educational tool, enabling students to experience a learning environment that combines real-life physical and virtual objects. This combination augments what is possible with physical learning material alone and uses the real world as a frame of reference for digital content. Nonetheless, creating a metaverse-enriched lesson requires specific digital skills and expertise that can be very challenging for many educators who have no or little relevant background. During the workshop, the teachers will build upon current “traditional” effective civic education practices in primary education that teachers/practitioners will share. During the day, we will establish a community for in-service teachers to discuss/debate and improve learning scenarios in civic education using metaverse. Teachers need to be actively present as creators of the scenarios.

**Equipment needed by the participants:** Participants are required to bring their own device (phone or tablet).

### Workshop 3. Leveraging Extended Reality Technologies in the Cypriot Education System

Christos Roushias

Teachers’ Educator - Educational Technologist at the Cyprus Pedagogical Institute

This workshop will focus on Extended Reality (XR) technologies and their integration into the Cypriot education system. XR technologies offer, among other benefits, the possibility for students to “travel,” experience, and explore various spaces and three-dimensional (learning) environments in an immersive way, which they would not easily be able to access physically (e.g., microcosm or macrocosm). These emerging and innovative technologies also contribute to enriching the user experience by transforming students’ “third-order experiences” into “first-order experiences.” Through immersive 3D representations, students are given the possibility of free navigation and exploration, enhancing their interest and motivation for learning by offering a more “lively” and attractive learning environment.

During the workshop, we will explore the educational use of “interactive virtual reality tours - 360° learning environments” and the capability of creating them using the Project-Based Learning method. Examples of such projects, implemented by students and teachers from primary and secondary schools in Cyprus, will also be showcased. Finally, there will be a brief discussion on the use of Artificial Intelligence tools in the field of Extended Reality and the creation of these 360° virtual tours and environments.

**Equipment needed by the participants:** Participants are required to bring their own smartphone device.

## Workshop 4. Collective Intelligence Integration in AI-powered Education Practices: How can we engage students?

Mrs. Maria Filippi<sup>1</sup> and Dr. Yannis Kotsanis<sup>2</sup>

1. Head of Informatics Literacy and Digital Education, Doukas School, Athens, Greece
2. Head of RD at Doukas School, Athens, Greece

The driving question of the workshop is: *how can we engage students using AI and sustain motivation?* Can we achieve this by bridging the gap between traditional practices and the demands of a rapidly AI data-driven digitalized world, empowering students to become proactive learners and creators of their own intellectual development? The workshop aims to equip educators with an AI ecosystem structured around the following key principles:

- Integration of Collective Human Intelligence (CHI) and Artificial Intelligence (AI): CHI & AI complement each other in the design and implementation of educational processes.
- Resource Utilization and Educator Training: Leveraging essential sources and generic resources to integrate AI into teaching methodologies, fostering an enriched, interdisciplinary, and peer-to-peer learning experience.
- Evolution from "Objects-to-Think-With" to "Agents-to-Think-With": Facilitating a gradual shift from traditional educational tools to contemporary intelligent assistants that support various thematic areas and interact with educators and students.

Based on a well-documented AI Educational Framework of Ethics, the workshop focuses on the essential skills educators and interested parties need to effectively utilize the most significant and up-to-date free AI tools to boost student engagement in class. The list of AI environments and tools recently tested by the educational community includes:

- Recognition and Generation of Audiovisual Material, Faces, Objects etc. (Prompting),
- Natural Language Processing and Avatars (any kind of oral-written transformations),
- Machine Learning (training with public or personal data),
- Generation and Optimization of Educational Material (e.g., Lesson/Learning Plans, etc.)

**Equipment needed by the participants:** Participants are required to bring their own device (phone or tablet).

## Parallel sessions

Friday 13<sup>th</sup> September, 11.20-13.10

### Session 1: Learner Engagement and AI in Education

#### *Interacting with AI: Analyzing Undergraduate Student Engagement with Cipherbot Among 74 Undergraduate Business Students*

Trang Xuan<sup>1</sup>, Joni Salminen<sup>2</sup>, Waleed Akhtar<sup>3</sup>, Soon-gyo Jung<sup>4</sup>, Kholoud Aldous<sup>5</sup>, Jinan Azem<sup>6</sup>, Johanne Medina<sup>7</sup> and Bernard J. Jansen<sup>8</sup>

1. School of Marketing and Communication, University of Vaasa, Finland
2. School of Marketing and Communication, University of Vaasa, Finland
3. School of Marketing and Communication, University of Vaasa, Finland
4. Qatar Computing Research Institute, Hamad Bin Khalifa University
5. Qatar Computing Research Institute, Hamad Bin Khalifa University
6. Qatar Computing Research Institute, Hamad Bin Khalifa University
7. Qatar Computing Research Institute, Hamad Bin Khalifa University
8. Qatar Computing Research Institute, Hamad Bin Khalifa University

Compared to conventional educational chatbots, there is a lack of empirical evidence on the impact of AI-based chatbots on learning experiences and outcomes. These bots rely on Generated AI and particularly large language models (LLMs). Cipherbot is an educational chatbot using an LLM to address student queries concerning learning materials uploaded by the educator. Cipherbot aims to support students' learning by providing scalable and personalized answers based on actual course content, thereby freeing teacher's time. In this study, Cipherbot was tested in a classroom setting where 44 university students used Cipherbot for seven weeks in an undergraduate business course. We investigate how students' engagement with Cipherbot evolves over time, how it correlates with the use of other learning systems (Moodle and Perusall), and what concerns students report on a weekly basis. Our findings inform educators about the pros and cons of using educational AI chatbots and system developers and how these systems could be further improved.

#### *Augmenting the Learning Experience The ALEX Implementation Framework for Higher Business Education: From Affordances to Implementation*

Matt Glowatz<sup>1</sup> and Eleni, Mangina<sup>2</sup>

1. University College Dublin, Republic of Ireland
2. University College Dublin, Republic of Ireland

This practice-based thematic PhD in inclusive design and creative technology innovation research entitled "Augmenting the Learning Experience: The A L E X Implementation Framework for Higher Business Education: From Affordances to Implementation" investigates and measures the effectiveness and impact of novel, innovative, immersive augmented reality (AR) enhanced curriculum design on higher education business students' learning experience. As a result, the term "learning experience" incorporates three core components: motivation, engagement, and knowledge acquisition and retention. This thesis narrates previous research conducted in the knowledge area of immersive learning with particular focus on Augmented Reality (AR) in education settings in the context of two underlying theories deemed most relevant for this research, namely 1) Mayer's science

of instruction and multimedia learning (Mayer 2011, 2020) and 2) Koehler and Mishra's (2009) Technological, Pedagogical, and Technology Knowledge (TPACK) framework. To address and find conclusive answers, this research utilized a mixed method research approach sampling, testing, and measuring data from research participants enrolled in selected undergraduate business modules at this project's research site, namely University College Dublin's (UCD) College of Business (CoB). Research findings prove that the novel learning approach utilizing AR experiences can be an optimum tool to enrich learning experiences in higher business education. The author proposes an Augmented Learning Experience (ALEX) implementation framework offering Higher Education sector's stakeholders a unique opportunity to successfully include Augmented Reality Learning Objects (ARLOs) into their curriculum. Hence, successful ALEX implementation allows students to engage with curriculum material more meaningfully, resulting in higher levels of student motivation, engagement with learning content, and knowledge acquisition. Consequently, this thesis makes an original and substantial contribution to knowledge in learning and education by introducing a best practice AR Learning Experience (ALEX) implementation framework and associated toolkit for higher business education.

### *The GeoGebra Intelligent m-Tutors*

Dimitrios Sklavakis<sup>1</sup>

#### 1. European School Brussels II

One-to-one tutoring has proven to be one of the most effective ways of teaching. The implementation of this tutoring model poses the problem of developing Intelligent Tutoring Systems that provide the same tutoring quality as a human tutor. The most successful paradigm is that of Model-Tracing Tutors, which have shown significant success in mathematics. This paper describes a suite of web-based, intelligent model-tracing tutors for 2-dimensional vector geometry developed using GeoGebra and JavaScript. They cover the following competencies: calculation of vector coordinates graphically and from its initial and terminal points; calculation of vector magnitude from its coordinates; calculation of distance of two points from their coordinates; calculation of a segment's midpoint from the coordinates of its endpoints; investigation of whether two vectors are parallel/vertical or not; calculation of a line's equation from two points; from its slope and one point; calculation of the point of intersection of two lines; calculation of a line's equation parallel/vertical to another line; calculation of the acute angle of two lines; calculation of the distance of a point from a line; calculation of the projection of a point to a line; calculation of the distance of two parallel lines. Each tutor guides the student step-by-step, providing feedback and support in every step, which is the cornerstone feature of model-tracing tutoring that makes it so powerful and effective. The tutors are modular, implementing the above atomic and composite competences in various levels of domain cognitive task analysis (micro-, midi- and macro-levels). Implemented as webpages, they call each other to achieve this modularity and scalability. The uniqueness and novelty in the implementation and combination of all these advanced features - model-tracing, modular, micro-, midi- and macro-tutoring - justifies the use of the m- prefix of the GeoGebra intelligent m-Tutors.



### ***The use of Artificial Intelligence and Educational Robotics for Improving Childrens' Knowledge and Skills in the Management of Natural and Man-made Disasters***

Anastasia Karampela<sup>1</sup> and Nikolaos Larios<sup>2</sup>

1. Faculty of Primary Education, National and Kapodistrian University of Athens, Athens, Greece
2. Faculty of Primary Education, National and Kapodistrian University of Athens, Athens, Greece

The study aimed to enhance the knowledge and skills of upper primary school children in managing natural and man-made disasters through the utilization of artificial intelligence. Pre- and post-testing methods were employed to evaluate the children's performance. Initially, their awareness of different disaster categories, examples, causes, and disaster management utilizing artificial intelligence was assessed. Additionally, their skills, such as environmental consciousness, critical thinking, problem-solving, independence, and self-confidence in disaster management, were developed. Results demonstrated significant improvements as children became adept at analyzing information, evaluating sources, and formulating solutions related to disaster management with artificial intelligence. They recognized the importance of AI in environmental protection, boosting their self-confidence in disaster-related concepts. The intervention included the construction of a rescue robot, in which children built a Lego model of a city struck by an earthquake. They programmed the robot using the color sensor for following a black line, face recognition to locate their faces and recording the survivors' numbers, reflecting real-life scenarios. The Quarky educational kit facilitated the robot's construction, equipped with various sensors, and programmed using PictoBlox, a block-based programming software. This intervention significantly enhanced children's knowledge and skills. By engaging in the construction process and utilizing the rescue robot powered by AI, children gained profound insights into disaster management procedures and technology. This underscores the importance of educating children on safety measures, equipping them to handle potential crises leveraging modern technological advancements.

### ***A Virtual Reality-Based serious game for simulating the growth of plants in different environmental conditions***

Kostas Tsaramiris<sup>1</sup> and Dimitris Piromalis<sup>2</sup>

1. University of West Attica
2. University of West Attica

Agricultural production is often situated in urban areas due to the lower cost of land and the ample availability of space. However, certain crops require specific conditions, such as mountainous terrain or abundant water, which can necessitate farming in more challenging locations. Consequently, farmers in these regions may experience social isolation and have limited access to expert advice. Additionally, changing environmental conditions, plant diseases and other parameters, require the farmers to keep updating their knowledge. To address these challenges, we developed a simulation model capable of predicting the growth of specific plants under various environmental conditions. This model is integrated into a serious virtual reality game that allows farmers to visualise plant growth in different scenarios. In this study, we focused on simulating the growth of a single plant species under limited environmental conditions. The primary objective of this application is to educate farmers about the evolving needs of their crops in response to environmental changes.



## ***Enhancing Agricultural Education with Artificial Intelligence and QGIS: Experiences from the INSAC AGRIS Project***

Daniel Amariei<sup>1</sup>, Gabor Milics<sup>2</sup> and Krisztina Toth<sup>3</sup>

1. Projektberatung und Management Expert Assoziation – PAMEA, Austria
2. Hungarian University of Agriculture and Life Sciences – MATE, Hungary
3. Hungarian University of Agriculture and Life Sciences – MATE, Hungary

Integration of Artificial Intelligence into Geographic Information Systems, particularly QGIS, offers real interesting opportunities for advancing the agricultural education and training area. This article aims to present the use of AI techniques incorporated into the QGIS platform for the implemented INSAC AGRIS project, with the objective of enhancing training in precision agriculture, especially for predicting best days for crops treatments. The study primarily investigates the capability of artificial intelligence to analyse geographical data related to the crop parcel, including soil composition datasets, satellite imaging, drone photography, and meteo datasets, analysis which aims to improve agricultural data and decision-making. As a result, there is an increased focus on educating farmers and agriculture advisors in practical skills and knowledge to improve crop yields, lower expenses, and adopt a data-driven approach in their decision-making. The technique creates a detailed workflow guide for integrating AI with QGIS. The primary results of this research primarily focus on the precision of predictions and soil productivity, as well as the optimization of resource utilization. Our study explores the significant problem and opportunity posed by the practical application of modern technology in the sector of agriculture, which necessitates extensive learning and re-learning.

**Friday 13<sup>th</sup> September, 11.20-13.10**

### **Session 2: AI in Higher Education: Transforming Pedagogical Practices**

#### ***The Perception of Higher Education Teachers Regarding the Use of AI-based tools to Personalize Learning: A Pre/post Training Analysis in Romania***

Georgeta Chirlesan<sup>1</sup> and Dumitru Chirlesan<sup>2</sup>

1. National University of Science and Technology POLITEHNICA Bucharest -Pitesti University Centre
2. National University of Science and Technology POLITEHNICA Bucharest -Pitesti University Centre

University students possess distinct learning paces, styles, and preferences. This generates differences among them in learning skills and levels and makes the personalization of learning more necessary within today's challenging Higher Education (HE) environments. HE teachers seek efficient ways to adapt teaching to students' various learning needs and provide personalized learning to foster engagement, deeper understanding, and more meaningful educational outcomes. Using Artificial Intelligence (AI) tools to support personalized learning represents a feasible and efficient solution. Still, to become applicable, it requires training the teachers on using AI tools and increasing their confidence in their own skills in this field. This study aimed to analyze how the HE teachers' perception changes in using AI-based tools to personalize learning through the training they received. Purposive sampling was used to form the study group. Questionnaire-based quantitative research was implemented on the study group composed of 24 Romanian HE teachers who, in April 2024, completed a 16-hour training course providing hands-on opportunities to learn how to personalize

their instruction through the open source/freeware AI-based and data visualization tools that do not require highly specialized computer skills, such as programming. A 10-item questionnaire, with multiple choice items on a 5-point Likert scale, was administered pre/post-training. Comparative analysis was employed to analyze the data. The results of the research indicate that HE teachers' perception of using AI tools to personalize learning improved due to the training: they are more confident, more able to select appropriate AI tools based on their affordances and benefits, and in general, more capable to design customized learning activities using AI and data-based tool. The paper presents detailed results of the study, achieved in the framework of the Erasmus+ project LEarning analytics and AI for personaliseD IEaRning [LeaderAI], funded by the European Commission.

### *Exploring Pre-service Teachers' Perspectives on Integrating Artificial Intelligence in Education*

Dimitris Panagou<sup>1</sup>, Konstantinos T. Kotsis<sup>2</sup> and Georgios Stylos<sup>3</sup>

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Artificial intelligence is becoming increasingly important in our daily lives and will shortly play a determinant role in shaping the future of educational reform. Educators worldwide have integrated it into their daily routines due to its widespread adoption. This study's primary objective is to examine pre-service teachers' viewpoints currently enrolled in a Department of Primary Education regarding the significance of artificial intelligence (AI) within higher education settings. Using a quantitative descriptive technique, data were obtained from a convenience sample of freshman pre-service teachers. The participants in the study were chosen randomly to ensure a representative sample and minimize bias in the findings. Many pre-service teachers responded neutrally to questions about artificial intelligence (AI), indicating a potential lack of knowledge.

On the other hand, many respondents showed optimism about the positive impact that AI-related technology is expected to have on different aspects of education, as evidenced by the findings. Furthermore, it was found that pre-service teachers felt that artificial intelligence may have several benefits. Still, it has several drawbacks, which positively and negatively affect instructional practices. In conclusion, it is recommended that pre-service teachers receive better training and support systems to effectively implement AI systems in their educational practices.

## ***Artificial Intelligence in Higher Education: Exploring AI Tool Adoption and its Impact in Universities***

Mac Stevely<sup>1</sup>, Levent Gorgu<sup>2</sup>, Eleni Mangina<sup>3</sup> and Aikaterini Kanta<sup>4</sup>

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2. University College Dublin, Republic of Ireland
3. University College Dublin, Republic of Ireland
4. University of Portsmouth, United Kingdom of Great Britain and Northern Ireland

The meteoric rise of AI tools in recent years has changed many aspects of society and daily life. AI is increasingly integrated into professional settings, from customer service to assembly lines agriculture to transportation. Virtual assistant technologies such as Alexa, Siri, and Google Assistant are now present in numerous households worldwide, ready to provide an answer to any query. Large Language Models like Chat-GPT are used instead of internet search engines; their answers are often deemed trustworthy without verification. One of the areas where the adoption of AI tools for learning has increased exponentially is education. Indeed, integrating AI tools in academic institutions has transformed teaching and learning practices. In this paper, a survey of students and staff of a UK higher learning institution is conducted that looks at the different ways AI is used and attempts to explain its growth in popularity. It further explores the new role AI tools play in universities by looking at the impact on learning outcomes, student engagement, ethical considerations, and how these are perceived by students and staff alike.

## ***Enhancing AI literacy Among Educators: A Piloting Study***

Lize Michorius<sup>1</sup>, Francisco José Castillo Hernández<sup>2</sup> and Miquel Pérez Torres<sup>3</sup>

1. University of Groningen, Netherlands
2. University of Groningen, Netherlands
3. University of Groningen, Netherlands

This study addresses the integration of AI into educators' teaching practices through tailored professional development, aiming to enhance AI literacy and ethical awareness. Conducted as part of the Erasmus+ project INFINITE (artificial iNtelligence For professional aNd pedagogical pracTices in Higher Education), the research employed a design-based research approach to develop and assess a comprehensive AI literacy workshop for higher education educators. Seven educators specializing in science education and communication participated in the workshop, which utilized social constructivist learning principles to improve attitudes towards AI and facilitate responsible AI integration in education. Pre- and post-workshop surveys employing Likert-scale statements measured changes in attitudes, while open-ended questions gathered qualitative feedback on workshop content and delivery. Quantitative analysis indicated a significant increase in perceived ease of use of AI post-workshop. However, perceived usefulness and behavioral intentions towards AI remained largely unchanged. Qualitative feedback highlighted participant satisfaction with practical exercises and group discussions, particularly those emphasizing prompt engineering and ethical considerations. Participants valued hands-on activities that provided concrete skills for effective AI use in educational settings. Suggestions for improvement included more interactive activities, better alignment with participants' prior knowledge, and extended time for practice. In short, this initial piloting study within the Erasmus+ INFINITE project represents the first step in building a competence

framework for higher education educators regarding the use of AI. This foundational work is part of a broader initiative to develop a series of training sessions to enhance AI literacy, with a core focus on ethical considerations and critical thinking. By addressing key areas for future improvement, we aim to optimize outcomes and foster a comprehensive understanding and effective integration of AI in higher education.

### ***AI Integration in Higher Education: A Comparative Study of Professional and Pedagogical Practices Across Europe***

Eleni Trichina<sup>1</sup>, Efi Nisiforou<sup>2</sup> and Charalambos Vrasidas<sup>3</sup>

1. University of Nicosia, CARDET
2. University of Nicosia
3. CARDET, University of Nicosia

The INFINITE project aspires to provide faculty members in Higher Education with the necessary skills to use AI-based technology in their professional and pedagogical activities ethically and critically. Three main research issues are addressed by the study, which was carried out in Cyprus. Initially, it emphasizes the wide range of applications of AI-based tools in Higher Education (HE), including the improvement of teaching quality, the simplification of administrative duties, and the facilitation of personalized learning experiences. Second, it draws attention to the serious dangers that AI in higher education entails, including moral questions about equality, privacy, and prejudice. Third, the research demonstrates the beneficial effects of AI on the teaching and learning processes of both university instructors and students, demonstrating enhancements in administrative efficiency and instructional support. The significance of a comprehensive approach to AI integration in HE is underscored by the study, which stresses the necessity of targeted training, ethical guidelines, and a robust infrastructure to optimize benefits, while minimizing risks.

**Friday 13th September, 11.20-13.20**

### **Session 3: Closed Policy Workshop in the framework of the European Agenda for Adult Learning 2024-2025, Ministry of Education, Sports and Youth**

This session is by invitation only.

The closed policy workshop will be organized during Learning Innovations Summit 2024 which is organized by CARDET in collaboration with the University of Nicosia, the University of Groningen and the University College Dublin, under the auspices of Cyprus' Ministry of Education, Sport and Youth.

It aims to bring together policymakers and representatives from various departments of the Ministry of Education, Sport and Youth of Cyprus, as well as other organizations- governmental and non-governmental- within the Republic of Cyprus, that are actively involved in adult education and lifelong learning. The goal is to deepen the discussion on how these entities promote digital skills among adults and adult educators, address the role of Artificial Intelligence in the teaching process and advance the initiatives of their respective organizations to enhance digital literacy among adult learners. Additionally, participants will explore how they can strengthen collaboration and synergies among their organizations to ensure that more adults benefit from the available opportunities

These objectives align with the broader goals of the Learning Innovations Summit 2024, as well as the aims of the European Agenda for Adult Learning for 2024-2025, which is being implemented by the European and International Affairs, Lifelong Learning, and Adult Education Bureau.

## Participants

The workshop will be closed to the public and it will include key participants such as policymakers, representatives from various departments of the Ministry of Education, Sport and Youth of Cyprus, as well as representatives from other organizations within the Republic of Cyprus that are actively engaged in adult education and lifelong learning.

The working language of the workshop is Greek.

## Issues of Discussion

Participants will engage in an open discussion following brief introductory remarks by Dr Eleni Mangina, Professor at the School of Computer Science at University College Dublin and Vice Principal (International) for the College of Science and Dr Ioannis Savvides, National Coordinator of the European Agenda for Adult Learning in Cyprus.

The discussion will focus on the following questions:

1. How does your department or organization currently promote the development of digital skills among adult learners and adult educators, and what additional measures can be taken to enhance these efforts?
2. How can your department or organization better integrate Artificial Intelligence into the adult education curriculum to not only enhance the teaching process but also prepare adults for the evolving digital landscape?
3. How can your organization collaborate more effectively with other entities to create a cohesive strategy that promotes digital skills development among adult learners and educators across Cyprus, ensuring broader access to available learning opportunities?

Friday 13<sup>th</sup> September, 15.45-17.45

## Session 4: Innovative Approaches to Language and Science Education through AI and Digital Tools

### *AI and Roleplaying to Enhance English Teaching: A Sentiment Analysis*

Edward A. Lockhart Domeño<sup>1</sup> and Carol Barriuso Rayo<sup>2</sup>

1. Institut El Morell, Spain
2. Universitat de Barcelona, Spain

This paper explores the qualitative results of an innovative subject designed to improve the oral use of English by various groups of year-two secondary school students in Institut El Morell, Tarragona. In this module, the learners play a teacher-led fantasy role game in which they immerse in a story: they have found an uncharted island (hence the name of the game, Fantasy Island). They must control and interpret the main characters in the game in collaborative groups while the teacher narrates to them what is happening or who they are meeting while the mysteries unfold. This subject uses technology to improve the learning experience. AI-designed maps are used to make the game more immersive, while generative AI is used to help convert the adventure into an adapted, illustrated text. The text is then run

through ElevenLabs (AI) to convert into a high-quality narration to make reading more enticing. This paper explores the qualitative results extracted from the learners' open comments at the end of the subject in a survey. The sentiment analysis of those data illustrates what the students appreciated the most about the experience and what they think should be improved.

### ***The Use of Digital Storytelling in Science: Meaning Making with Students Aged 11-12 Years Old***

Popi Anastasiou<sup>1</sup>

1. University of Nicosia

The process of creating and telling a story depends on how one can see one's understanding of something come together and make sense. It is considered a (socio) constructivist strategy of learning. Allowing students to engage in and interact with the learning environment by manipulating the presented information (Hillmayret al., 2020) makes them active producers, not just passive recipients of their learning (Gee, 2005). Such engaged participation means ownership of the learning process because students work at the peak of their abilities and knowledge (Gee, 2003), increasing motivation and attention on a task (Deterding et al. 2011; Simões et al. 2013). The purpose of this research was to explore how digital storytelling might support early secondary students' engagement in science meaning-making. Two research questions were examined to this aim: a) How did students engage in science meaning-making through two different digital storytelling activities? b) How did students perceive the collaborative digital storytelling activities? A qualitative approach was used to collect and analyze data from twenty-two Year 7 students from an English secondary school. Findings revealed that the gameful activities helped students to engage in science meaning-making while working independently (without the teacher's guidance). Students viewed the one activity as challenging, hard to complete, and at times tiring and confusing, and the other activity as more straightforward to implement.

### ***RE.MA.C.'s Educational Material and Digital Tools: Teachers' Take in Diverse Classrooms***

Nansia Kyriakou<sup>1</sup>, Nikleia Eteokleous<sup>2</sup>, Maria Mitsiaki<sup>3</sup>, Zoi Ioannidou<sup>4</sup>, Despo Kyprianou<sup>5</sup>, Raphaela Neophytou<sup>6</sup> and Elena, Xen<sup>7</sup>

1. Frederick University, Cyprus
2. Frederick University, Cyprus
3. Democritus University of Thrace, Greece
4. Democritus University of Thrace, Greece
5. Frederick University, Democritus University of Thrace, Ministry of Education, Sport And Youth
6. Frederick University, Cyprus
7. CARDET, Nicosia, Cyprus

There is a high density of bi-/multilingual student populations worldwide (UNICEF, 2023), placed soon after arrival in mainstream classrooms, making mainstream teachers a significant factor in



determining their academic success (Guler, 2018). Most of these teachers have little knowledge of the second language and intercultural education (Pettit, 2011; Rodríguez-Izquierdo et al., 2020), while there is a constant need to develop their digital competencies further, as reported by the EU (DigComp 2.1 and DigiCompEdu) (Carretero, Vuorikari & Punie, 2017; Redecker & Punie, 2017). This paper draws from qualitative data from the Erasmus+ KA2 project, Reinventing Mainstream Classrooms (2022-01-CY-1-KA220-HED-000088107). RE.MA.C. team, following a well-rounded, theoretically-driven approach, has developed multifaceted educational material based on a blended learning model (Laurillard, 1993, 2002, 2014) using various digital tools (i.e., AI tools, reading progress, H5P application). This paper comprehensively explores teachers' reflections on using RE.MA.C.'s material and tools in multilingual and multicultural classrooms in Cyprus and Greece. Data were gathered via semi-structured interviews and reflective diaries using a thematic analysis approach to identify key themes (Braun & Clarke, 2006). These reflections focus on the effectiveness, challenges, and potential improvements in utilizing the blended learning model and the proposed educational material, along with its digital tools to enhance educational outcomes. Teachers reported that the material and the available digital tools facilitate differentiated instruction, foster interactive and engaging learning environments, and provide access to a wealth of resources and information. However, challenges such as digital literacy, infrastructural limitations, and resistance to change persist. This paper also highlights innovative practices where digital tools have significantly transformed the educational experience. Specifically, case studies include the use of an AI tool for immersive learning, adaptive learning platforms for personalized education, and collaborative tools that enhance student engagement and teamwork.

### *Enhancing Education through Effective Technology Integration*

Marilena Neocleous<sup>1</sup>

#### 1. The English School, Nicosia, Cyprus

“To improve learning, technology must be used in a way informed by effective pedagogy.” Using Digital Technology to Improve Learning, EEF Guidance Report (2019) This workshop is based on the above notion. It aims to explore practical ways technology can have a lasting impact on enhancing student engagement and learning outcomes. A key component of this discussion is the role of AI in education. We will examine how AI-generated work can be accepted as students' work and explore strategies to ensure the authenticity of student-produced content. A well-curated list of educational tools will be presented and evaluated based on their alignment with students' needs, skills, and interests. Criteria such as accessibility, user-friendliness, interactivity, and the potential to engage students and foster critical 21st-century skills will be emphasized. Participants will leave this workshop equipped with practical strategies for integrating technology and AI into their teaching practices, fostering a dynamic learning environment where students are encouraged to share ideas, ask questions, and engage deeply with the material. Special emphasis will also be given to a specific digital toolkit designed to produce AI-proof assignment ideas such as Microsoft Flip and Kialo edu. Join us to explore how innovative technology and AI can transform education, ensuring that learning is both engaging and authentic.



Friday 13<sup>th</sup> September, 15.45-17.45

## Session 5: Case Studies of XR & Informatics in Education

### *Enhancing Informatics Education in Cyprus: Detailed Insights from the TINKER Project*

Chrysanthi Konstanti<sup>1</sup>, Efi Nisiforou<sup>2</sup>, Eleni Trichina<sup>3</sup> and Charalambos Vrasidas<sup>4</sup>

1. CARDET, Nicosia, Cyprus
2. University of Nicosia, Nicosia, Cyprus
3. University of Nicosia, Nicosia, Cyprus
4. CARDET, Nicosia, Cyprus

Informatics education is still fragmented with regards to its content and curricula, and the pedagogical approaches for teaching and assessing informatics across schools in Europe. The TINKER project is a comprehensive Europe-wide initiative investigating the state of informatics education using a mixed-methods approach, including focus groups with teachers (n=55) and an extensive online survey (n=432) to identify common challenges and national variations in informatics education. For this paper, we present in detail the results obtained from Cyprus. The research addresses persistent issues in informatics education within Cypriot schools, such as limited resources, inadequate teacher training, and unclear guidelines. These challenges are compounded by significant barriers such as resistance to change, insufficient support structures, and a scarcity of appropriate educational materials, impeding the fostering of authentic learning environments and achieving gender inclusivity in informatics classrooms. Key areas for improvement include teacher training, resource allocation, and clear implementation guidelines. Analysis of the Cypriot data reveals a consistent narrative of obstacles that align with those found in other countries despite specific national policy differences. The research results underscore the urgent need for a comprehensive pedagogical framework integrating authentic learning and gender inclusivity into informatics education, particularly where informatics is not a standalone subject. The TINKER framework aims to develop students' digital critical thinking and foundational informatics skills, addressing existing gaps. The TINKER approach, which emphasizes these elements, is a valuable tool for educational reforms in Cyprus. The study highlights the importance of coordinated efforts and strategic interventions to enhance authentic and inclusive informatics education, preparing students for the digital age.

### *XR Scan: The case of Flanders schools*

Pieter Schutijser<sup>1</sup> and Stéphanie Vanneste<sup>2</sup>

1. Gent University, Belgium
2. Gent University, Belgium

In Flanders, the XR Action Plan was rolled out, involving the distribution of XR hardware and software, software development, and professionalization of in-service teachers of secondary education. For those secondary schools, it is not always clear how XR-ready they are. Therefore, UGent and partners developed an XR scan based on several theoretical frameworks: Utaut, Horvers, Four-in-balance, Reference Framework of Educational Quality, etc. By completing the questionnaire, the schools are graded on 10 XR-related domains: hardware, network and management, software, vision, policy, professionalization, integration into teaching practice, teachers' perceptions and attitudes, teachers'

competencies, and students' competencies. In their report, they get a score from zero to three on what expert level they have currently reached. Additionally, the school receives feedback and inspiration to develop further in various domains. During the research of this scan several analyses were made to validate this survey (e.g. confirmatory factor analysis, focus groups) and it's tested out in 80 schools. At this moment we are in the last phase of the development and research of this XR scan, as it is planned to implement this XR in the next academic year.

### ***Navigating The Maze of The Ever-Changing World of XR For Efficient Implementation in an Educational Setting: The Case of VR***

Dimitrios Boglou<sup>1</sup>

1. Cyprus University of Technology, Limassol, Cyprus

Virtual Reality is a strong educational tool with the potential to improve education and take learning experiences to new heights. Because of its transformative impact, virtual reality has permeated and spread throughout different educational institutions and courses, including foreign language instruction, nursing, and engineering, to name a few. However, the rapid advancement of VR since 2016, with the launch of the Oculus Rift (Dingman, 2021) and the several VR headsets accessible in the mainstream market today, makes it highly challenging for educators to adapt and integrate this technology into their classrooms. Implementing VR without the necessary research, technical knowledge, lack of content, or poor content selection can lead to the dismissal of this emerging technology. This presentation provides an overview of CUTing Edge's American Space (Makerspace) VR training curriculum for educators to ensure a successful introduction of VR in the classroom and how to keep up with the updates.

### ***How the Flemish Government Ensures Large-Scale Implementation of XR in Education***

Joke Lippens<sup>1</sup>

1. VIVES University of Applied Sciences, Belgium

Studies have clearly shown how Extended Reality (XR) supports students' learning processes and, therefore, enhances learning outcomes. Thanks to XR, students can practise situations or interact with the inaccessible in a safe and controlled environment. Learners' motivation increases when they can use immersive technology.

Friday 13<sup>th</sup> September, 15.45-17.45

## Session 6: Ethical and Innovative AI Applications in Education: Balancing Advancement and Responsibility

### *Fairness, Accountability, Transparency, Empowerment: Establishing Ethical Principles for AI in Higher Education*

Anna Bougia<sup>1</sup>, Konstantinos Chardavelas<sup>2</sup> and Anastasios Liapakis<sup>3</sup>

1. New York College Athens/ Computer Technology Institute, Athens, Greece
2. New York College Athens/ Computer Technology Institute, Athens, Greece
3. New York College Athens/ Computer Technology Institute, Athens, Greece

This study focuses on developing an innovative ethics framework for the integration of Artificial Intelligence (AI) in higher education, aligned with the European Union's ethics guidelines. The project addresses the need for ethical oversight in the deployment of AI technologies in educational settings, ensuring that such implementations are responsible, transparent, and conducive to student learning and autonomy. Emphasizing four key ethical pillars—Student Agency, Privacy Concerns, Prevention of Harm, and Explainability—this research aims to harmonize AI applications with the ethical standards proposed by the European Union, particularly those concerning human oversight and algorithmic transparency. The study will use qualitative research methods, including interviews and open-ended questionnaires, to gather data from students experiencing AI-driven educational tools, such as adaptive learning platforms and AI-enhanced tutoring systems. This approach will enable a comprehensive understanding of student interactions with AI, highlighting areas where ethical practices can be improved to align with European standards. The anticipated outcome is creating an ethics framework that addresses the immediate ethical concerns associated with AI in education and sets a benchmark for future AI deployments across educational institutions. This framework will guide educators and policymakers, ensuring that AI enhances the educational experience without compromising ethical standards or student welfare. By aligning with European Union guidelines, the framework will ensure consistency and compliance in AI implementations across member states, fostering a standardized approach to ethical AI in education.

### *How To Train Your Dragon*

Costa Constantinides<sup>1</sup>

1. Lighthouse Primary School, Limassol, Cyprus

The zeitgeist is dead. Long live the zeitgeist. Schooling is dead; long live education! The Mission - Creation of AI-facilitated, unique, self-directed education that develops fully motivated, ethical, creative, and critical thinkers! The Concept - Instead of society/schools imposing knowledge and bias on children, Alternative Intelligence is or will soon be in a position to foster a paradigm shift in the educational process itself. Learning will no longer emphasize what questions we can answer but what we can ask. However, learning how to question our questions is a learning objective. Fundamentally, schools do not query their foundations. They assume they aim to supply Universities with pre-chewed food as the Universities provide employers with pre-chewed employees. Since AI/Robots will be capable of doing almost every job on earth within 20 years or less, the mission to make compliant

workers out of human beings can be safely replaced by a mission to create better human beings. The Process - we are in the formative stages of developing personalized AI Facilitators (or AGENTS) trained to optimize Creative and Critical Thinking (CCT). This is an ongoing process that in and of itself organizes and develops critical thinking. The Goal - Ultimately, the citizens of this 'brave new world' must first learn how to imagine and reimagine, think and rethink, and merge knowing and not knowing into an open-minded whole, always hungry to evolve their minds and their societies.

### ***Harnessing Sustainability: Integrating AI and XR for Eco-Friendly Education***

Mustafa Kemal Ambar<sup>1</sup>

1. Cyprus International University, Cyprus

In today's rapidly evolving educational landscape, the integration of artificial intelligence (AI) and extended reality (XR) technologies has become increasingly prevalent, offering new avenues for innovative teaching and learning experiences. However, alongside the benefits of these technologies, there arises a pressing concern for their environmental impact, including issues related to production processes, energy consumption, and electronic waste. The proposed presentation, titled "Harnessing Sustainability: Integrating AI and XR for Eco-Friendly Education," aims to address this critical intersection of digital innovation and environmental stewardship within educational contexts. The presentation will explore how educators and technology enthusiasts can leverage AI and XR tools to promote sustainability and recycling practices in education through engaging discussions, interactive activities, and insightful presentations. Participants will delve into the environmental implications of digital technologies in education, examining current challenges and opportunities for integrating sustainable practices into instructional design and learning experiences. Furthermore, the workshop will feature innovative case studies and practical demonstrations showcasing sustainable approaches using AI and XR technologies. Attendees can brainstorm and develop eco-friendly projects utilizing recycled or repurposed materials, fostering hands-on learning experiences and creativity.

### ***Primary School Teachers' Beliefs on the Use of Large Language Models in the Arts***

Konstantinos Mastrothanasis<sup>1</sup>, Panagiotis Alexopoulos<sup>2</sup>, Maria Kladaki<sup>3</sup> and Apostolos Kostas<sup>4</sup>

1. National and Kapodistrian University of Athens, Athens, Greece
2. University of the Aegean, Greece
3. University of the Aegean, Greece
4. University of the Aegean, Greece

The present study explores primary school teachers' beliefs regarding Large Language Models, such as ChatGPT, in the arts field. These 'chatbot' applications can process language structures and generate text similar to a human's at high speed. Interest in these AI tools was reignited in November 2022, when OpenAI made the ChatGPT application available, attracting millions of users—a development that raised expectations in the educational and scientific community but also raised concerns about its pedagogical impact. Mapping teachers' beliefs is important as it will highlight potential obstacles, risks, and benefits of using such applications. Notably, the specific link between teachers' beliefs and the arts remains unexplored. Utilizing Ajzen's (1996) theory of Planned Behavior, semi-structured interviews were conducted with 28 primary school teachers on the role of ChatGPT

in the arts. The study presents factors influencing the pedagogical use of such applications in the arts, highlighting potential benefits such as providing innovative ideas and risks like reducing creativity.

Saturday 14<sup>th</sup> September, 13.00-14.15

## Session 7: AI and STEAM Education

### *Fostering Critical AI Literacy in STEM Education: A Co-Design Approach to Developing Vision Documents and Workshops*

Miquel Perez Torres<sup>1</sup> and Francisco Castillo Hernandez<sup>2</sup>

1. University of Groningen, Groningen, Netherlands
2. University of Groningen, Groningen, Netherlands

The rapid incursion of Artificial Intelligence (AI) in Science and Engineering (S&E) faculties impacts research and education. While discussions on AI in higher education abound, opportunities to design learning environments that foster active learning with AI remain scarce. Educational developers must equip educators with critical lenses to analyze AI outputs, addressing anxieties around integration and uncertainties about evolving teacher roles. The Faculty of Science and Engineering at the University of Groningen addressed this need by a) developing a vision document to guide policymakers, and b) organizing professional development activities. Our design objectives were twofold: to identify key elements for an AI vision document relevant to STEM university teachers and students and to understand how such a document could influence the design and implementation of a workshop to foster critical AI literacy in scientific lesson planning in higher education. We employed a 3-stage iterative co-design process, inspired by evaluative research approaches, to develop an AI vision aligned with current research in STEM higher education and AI. We addressed the university community's concerns, needs, and existing initiatives. This process resulted in an AI vision document tailored for STEM university teachers: a) a definition of critical AI literacy, b) the necessary values to be upheld, and c) professional development guidelines. The subsequent workshop, designed based on these principles, examined the affordances and limitations of generative AI tools through various prompts and their impact on a newly designed 2-hour Biotechnology lesson plan for a Biology Bachelor's degree program. The workshop revealed several limitations of GenAI tools in designing science lessons, such as potential obscurantism where traditional methods are masked by formal educational vocabulary, ambiguous pedagogical approaches that may mislead educators, and a lack of justification for selected content and competencies regarding their appropriateness for the lesson or learning objectives.

### *GenAI-Powered Digital Game-Based Learning and GlossapAI: Revolutionizing Greek Education and Language Learning*

Stefanos Alifierakis<sup>1</sup> and Maria Pavlopoulou<sup>2</sup>

1. University of Edinburgh, Edinburgh, Scotland
2. University of Leeds, Leeds, United Kingdom

This article explores how GenAI can enrich Digital Game-Based Learning (DGBL) and enhance the learning experience for students of all educational levels (nursery, primary and secondary) focusing on Language Learning. After approaching the interlacing terms (Gamification, Digital Games, Digital Game-Based Learning) around the use of play and technology in education, DGBL approaches in Greek



public and private school education will be critically examined, interpreting the possible lack of them. Using GenAI technologies in DGBL could upgrade this field since they improve students' learning performances and promote their engagement with it, making the overall educational experience more enjoyable for learners. Moreover, GenAI-facilitated DGBL enables player data analysis, providing valuable feedback to game designers and, eventually, educators and education administrators. Through various customization and personalization options, each student's engagement with GenAI-powered DGBL will constitute a unique learning journey that could take diverse forms. The introduction of Generative Artificial Intelligence to DGBL will also welcome more interested teachers to participate in relevant hands-on projects in schools. The game design will be easier and more flexible thanks to GenAI's advanced features and will not require coding knowledge as a prerequisite. However, the possible challenges of such an important evolution should not be underestimated, such as ethical and artistic considerations. With a special focus on language subjects (e.g., modern and ancient Greek and Latin) due to our expertise, we attempt to present shorter or longer playful activities that approach learning and assessment using digital technologies and GenAI. All of them are part of our program proposal called GlossapIAI. Presenting this as a hypothetical case study platform, this article will delve into the suggested usage, through meticulous prompting, of GenAI chatboxes, Photo- and Video-GenAI apps, and more to co-construct a shared repertoire of GenAI-enabled DGBL activities for Language subjects.

### ***Promoting Gender Equality in STEAM through Innovative Educational Practices: Insights from the Blooming the Future Project***

Iro Koliakou<sup>1</sup>, Eleni, Mangina<sup>2</sup>, Tharrenos Bratitsis<sup>3</sup>, Maria Kyriakidou<sup>4</sup>, Dominique Persano Adorno<sup>5</sup>  
and Calin Rus<sup>6</sup>

1. Anatolia College, Thessaloniki, Greece
2. University College Dublin, Dublin, Republic of Ireland
3. University of Western Macedonia, Thessaloniki, Greece
4. Anatolia College, Thessaloniki, Greece
5. University of Palermo, Sicily, Italy
6. Intercultural Institute of Timisoara, Timisoara, Romania

This paper outlines the 'Blooming the Future' project, an EU-funded initiative aimed at addressing gender disparities in the STEAM fields— Science, Technology, Engineering, Arts, and Mathematics— among participants aged 14 and above. Led by the University of Western Macedonia with partners from Greece, Ireland, Romania, and Italy, this project is dedicated to enhancing gender equality through innovative educational practices across Europe. The initiative utilizes a suite of tools designed to empower young women and encourage a diverse range of students to engage with STEAM. These include a comprehensive online toolkit with educational resources, a narrative handbook featuring stories of women in STEAM to serve as role models, and targeted training programs for educators to promote gender-sensitive teaching approaches. By focusing on adolescents and young adults, the project targets a critical career and educational orientation period, aiming to influence future academic and career choices in STEAM fields significantly. The project's approach supports the enhancement of technical competencies and emphasizes the transformation of social attitudes towards gender roles within STEAM, promoting an inclusive culture that values diversity in educational and professional environments. This study presents outcomes across the four participating countries, illustrating both common challenges and unique national circumstances that influence the project's

implementation and effectiveness. The findings underscore the necessity for sustained engagement and strategic educational interventions to achieve gender parity in STEAM, suggesting a scalable model for broader European and global adaptation.

**Saturday 14<sup>th</sup> September, 13.00-14.15**

## Session 8: Technology Integration in Education

### *Artificial Intelligence in Kindergarten: A Qualitative Exploration of Teachers' Experiences*

Nikleia Eteokleous<sup>1</sup>, Maria Efstratopoulou<sup>2</sup>, Eleana Charalambous<sup>3</sup>, Raphaela Neophytou<sup>4</sup>, Theodora Patsalidou<sup>5</sup> and Jehan Abdulla<sup>6</sup>

1. Frederick University, Limassol, Cyprus
2. United Arab Emirates University, Emirates
3. United Arab Emirates University, Emirates
4. Frederick University, Limassol, Cyprus
5. Frederick University, Limassol, Cyprus
6. United Arab Emirates University, Emirates

Within the field of Early Childhood Education (ECE), where the focus lies on fostering development through play and exploration, the potential applications of Artificial Intelligence (AI) tools present a unique area of inquiry. This case study aims to evaluate the effectiveness of professional development training, exploring further integration of AI tools within their teaching and learning practices. Specifically, the study delves into the experiences and perspectives of kindergarten teachers regarding the use of AI in their ECE classrooms. This qualitative research employed a two-faced approach. During the first phase, ten (10) kindergarten teachers participated in an intensive one-day professional development training to introduce them to various AI tools specifically chosen for their applicability in ECE and their pedagogical and administrative use in ECE. Following the training, four (4) teachers participated in semi-structured interviews. The interview questions focused on five key categories: 1) their perceived needs for future AI training programs, 2) their feedback on the training they received, including strengths and areas for improvement, 3) how they envisioned utilizing the newly acquired knowledge about AI tools to enhance their teaching practices and student learning experiences, 4) their thoughts on the potential benefits and considerations of using AI tools to support the inclusion and learning of children with special needs in the kindergarten classroom, and 5) their desired future training opportunities related to AI technologies. The research findings contribute to the ongoing dialogue about AI integration in early childhood education by providing valuable insights directly from educators on the ground. By understanding teachers' needs, perspectives, and experiences, we can develop pedagogical frameworks, effective training programs, and appropriate educational resources to facilitate AI's responsible and impactful use in promoting positive learning outcomes for all kindergarten students.



## *Experiencing Learning Through Design Thinking and AI Embodiment*

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The M3 lab AI program is based on a co-creative, inclusive pedagogical methodology that provides equal opportunities for everyone to develop their proficient skills and acquire completely new ones. The M3 lab AI program gathers high schoolers who spend three months in the Makers space every Saturday to create, design, and produce their own projects that address a wide range of AI topics. During this presentation, we will share with the participants the M3 lab AI pedagogical method that was developed through years of iteration within the Makers space environment and allow them to embody this experience to adjust this method to their usual educational settings. The presentation will correspond to the M3 methodological framework: Ideation, Design Thinking, Prototyping, and Iterating. The Ideation phase is the brainstorming phase, where groups are spontaneously formed while students and mentors share their knowledge and ideas as peers. Everyone goes through a SWOT analysis to see what they can learn from each other and how they can contribute. During the Design Thinking phase, students develop conceptual ideas through co-learning and co-creation. The Prototyping phase is where the ideas come to life, while the created MVPs are challenged in the Iteration phase and the circle is repeated.

The program is based on several core values:

1. Everyone gets to learn and be taught
2. Don't just step outside the box – jump out of it
3. You can't force the dots to connect
4. We learn the most when we fail, not when we succeed

## *Factors influencing the adoption of AI tools by teachers*

Maria Stylianou<sup>1</sup> and Charalambos Vrasidas<sup>2</sup>

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This research study aimed to examine the factors that influence teachers' users' adoption of AI tools in the context of the TAM (Technology Acceptance Model) and whether this adoption would affect their workload. Via a qualitative method and triangulation, the study found that ease of use, education and training, motivation, organizational support, and consideration of teachers' attitudes were critical factors in tool adoption. The study provides valuable suggestions for effectively integrating tools with political supervisors in charge of decision-making.

**Saturday 14th September, 13.00-14.15**

## **Session 9: Metaverse and XR in Education**

### ***Automated Lip Reading: Exploring the Potential for Accessibility Measures in XR***

Hrishikesh Mulay<sup>1</sup>, Sam Redfern<sup>2</sup> and Eleni Mangina<sup>3</sup>

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Existing research indicates that immersive technology will significantly influence pedagogical practices in the coming years. Due to the visual nature of the XR (eXtended Reality) applications, the lack of auditory support systems and high dependence on physical gestures and movements makes immersive tech inaccessible for people with special needs. However, the increasing influence and rise of XR technologies have instigated an urgency to make XR environments accessible to the vulnerable segments of society. Deaf and Hard of Hearing (DHH) participants often face social challenges such as illiteracy, unemployment, lack of growth in personal and professional life and social isolation. Recent advancements in machine learning have opened opportunities for performing automated lip reading (ALR), which could be used as an assistive tool by DHH people within the XR world. This work in progress aspires to contribute towards the implementation of ALR systems in XR educational environments and provide an ethically aligned design and standardization in its implementation, to enhance accessibility measures in immersive technologies.

### ***Exploring Metaverse-Enhanced Learning: Learning Design Practices in K-12 Education***

Sonia Andreou<sup>1</sup>, Stephanie Papalla<sup>2</sup> and Andri Ioannou<sup>3</sup>

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Although the concept of Metaverse is not new, the topic has increasingly gained popularity due to its vast array of opportunities for innovation in education. Moreover, the COVID-19 pandemic contributed to further accelerating its adoption and the need for research around it (Alfiras et.al, 2023). The literature review seeks to synthesize work on learning design guiding the adoption and implementation of metaverse-enhanced learning in K-12 education. The review is framed around the Trinity of Learning Design (Wasson & Kirschner, 2020), which discusses Tools, Techniques, and Ingredients as the three intersecting aspects needed for an effective learning design. The framework above allows us to assess and document current metaverse-enriched learning experiences in K-12. Our study addresses two primary research questions:

(1) What are the current goals and learning design practices in using metaverse technology in K-12 education?

(2) What opportunities and barriers are inherent to adopting metaverse technology in K-12 education? By examining the extent to which learning design is articulated in existing literature, we aim to identify

the depth and breadth of pedagogical approaches, materials, technologies, resources, and processes being utilized.

Preliminary findings indicate that many studies involving the Metaverse often emphasize the implementation outcomes rather than the detailed learning design processes underpinning these outcomes. This limits the ability of educators and researchers to build upon existing work. Our findings further highlight both innovative practices and common obstacles educators face integrating metaverse technologies. Ultimately, we seek to provide a systematic review of learning design for metaverse-enriched learning experiences and to offer insights for future research and practice.

### ***Empowering Educators with XR for Immersive Learning: Vol3DEdu project's insights***

Eftychia Xerou<sup>1</sup>, Charalambos Vrasidas<sup>2</sup>, Chrysanthi Konstanti<sup>3</sup>, Eleni Mangina<sup>4</sup>, Konstantinos Amplianitis<sup>5</sup>, Filippos Tzortzoglou<sup>6</sup>, Alivisos Sofos<sup>7</sup> and Apostolos Kostas<sup>8</sup>

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7. University of Aegean, Greece

Equipping educators with digital skills and enhancing the quality of remote learning are key priorities of the EU's Digital Education Action Plan (2021-2027). The Vol3DEdu project addresses the evolving landscape of distance learning by integrating Extended Reality (XR) technologies and Volumetric 3D assets into lesson plans and storytelling techniques. Through the project, comprehensive training programs were developed to train educators in crafting immersive educational content. Participants engaged in workshops focused on designing XR-enhanced lesson plans, developing lesson plans incorporating Volumetric 3D content, and contributing to an open-access repository of 3D educational assets. Self-assessment data from 83 participants revealed promising outcomes and highlighted key areas for improvement. While understanding of learning objectives and Bloom's Taxonomy was high (88% and 92.8%, respectively), significant gaps were identified in recognizing comprehensive lesson plan components (48.2%) and the importance of differentiated teaching strategies (57.8%). These findings highlight the necessity for targeted training to bridge these knowledge gaps. The Vol3DEdu project aims to address these by providing access to XR resources and fostering collaborative content creation, aiming to democratize digital education and enhance teaching effectiveness across the EU.



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