CYPRUS INTERACTION LAB

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The Cyprus Interaction Lab (CIL) of the Department of Multimedia and Graphic Arts of the Cyprus University of Technology is an interdisciplinary research lab which specialises in Educational Technology and Human Computer Interaction. The lab was co-founded in 2011 by Panayiotis Zaphiris and Andri Ioannou and is the first of its kind in Cyprus. CIL stands out for its high-quality research and facilities.

We design with people and the community in mind, aiming to produce research with real-world impact. We seek to understand the significant supportive and mediating role of technology in promoting learning, communication and collaboration, social change and inclusion in varied circumstances and contexts. Research at CIL aims towards theoretical and practical frameworks in three thematic areas:

Thematic areas of CIL research:

Embodied Play and Gamefull Learning
Learning Design and Learning Spaces
Design for Social Change

CIL research draws on:

- Constructivist and constructionism pedagogy - Co-design with educators and stakeholders

- Human-centered design

- Authentic learning environments and real-world settings

[Welcome note from the lab director]



Associate Prof. Andri Ioannou Lab Co-founder & Director

Undoubtedly, the year 2019-2020 was a challenging one for all of us due to the worldwide pandemic. We have been tested in all aspects of our lives, including work where we had to complete tasks and duties without normal interaction with colleagues and collaborators. However, we are grateful to put together this newsletter once again, which despite the difficulties, does not look any less rich than our previous newsletters. Rather, it demonstrates the hard work and the many achievements of the group.

This year is signalled by two PhD graduations (Vaso Constantinou and Aekaterini Mavri), several publications, several new projects (some in collaboration with CYENS CoE) and our relocation to a new building at the Centre of the City of Limassol, closer to our Department, UG students and colleagues.

At CIL, we are proud to engage in research that helps unpack the potential of emerging technologies to positively influence our society. During the pandemic, CIL research becomes even more relevant as we continue to research innovative learning environment for learners of all ages (K-20) in the "shifting to digital" era. We keep our positive energy and welcome 2021, looking forward to new opportunities and achievements!

Enjoy reading about some of our work!

[Meet the lab people]



Andri Ioannou Management



Vaso Constantinou



Aekaterini Mavri Staff/Researchers



Panayiotis Zaphiris

Marianna Ioannou

Leantros Kyriakoullis



Antigoni Parmaxi

Stella Timotheou

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PhD Students



Chrysanthos Socratous



Giorgos Pallaris



Panagiotis Kosmas



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Leda Solomonidou



Eirene Constantinou



Sotiria Vorka



Maria Adamou



Panayiotis Hadjicostis



Andreas Stroumpoulis



Emily Kouzaridi

Michael Pingos



Eirini Christou





Constantinos Karseras



Stephanie Papalla



Andreas Kitsi





[PhD Graduates]



CROSS-ORGANIZATIONAL COMMUNITIES OF PRACTICE IN DESIGN STUDIES: ENHANCING CREATIVITY, PRE-PROFESSIONAL IDENTITIES IN HIGHER EDUCATION

COLLABORATION AND

Aekaterini Mavri

This dissertation investigates the role and impact of cross-organizational (industry-academia) Communities of Practice (CoPs) on learning in Higher Education (HE) Design studies. CoPs are groups of people who share a common interest in an area of 'endeavor' and connect to co-create knowledge through their social practice.

The research proposes that robust academia-industry collaborations can enhance academic programs and graduates' personae towards the development of soft-skills (creativity, collaboration) and real-world vocational relevance, through authenticity-driven, technology-supported, and curriculum-integrated cross-organizational CoPs (industry-academia) CoPs.

Following a mixed-methods approach, the research captures a diverse body of data to understand and explain the designed and emergent learning phenomena in CoPs. In doing so, the work reports on, as well as empirically validates the critical interlocking of the technological, epistemic and social designs that constitute an appropriate learning ecology for the complex practices of cross-organizational CoPs in HE Design studies. Importantly, it also delivers a structured set of actionable guidelines to assist researchers and practitioners in the adoption of the cross-organizational CoP model, with an aim to enhance learning in the HE Design disciplines.

DEVELOPING COMPUTATIONAL THINKING SKILLS VIA EDUCATIONAL ROBOTICS



Vaso Constantinou

Computational Thinking (CT) is an important concept in modern education. The scientific community seeks to determine how CT skills can be developed with the use of technological means. Few studies have systematically investigated the effectiveness of Educational Robotics (ER) activities for the development of CT skills. The purpose of this dissertation is to determine if ER activities can improve students' CT skills via ER. The dissertation presents an action research study consisting of four consecutive cycles.

The study was conducted in two private schools in Cyprus and examined the issue with a total of 118 student-participants over a period of two and a half years. Findings from quantitative data showed that students who participated in ER activities had a statistically significant improvement in CT as opposed to students who did not participate in ER activities. In addition, students who participated in ER activities were able to effectively solve complex problems in real ER competitions. This dissertation provides a comprehensive picture of the use of different ER technologies and shows that CT skills are developed through ER activities regardless of the technological tool being used. Finally, the dissertation provides researchers and educators with ideas and examples of how ER can be effectively used in the classroom for the development of CT skills.

[Research projects]

- newly funded -



The EDUBOTS Knowledge Alliance aims to document best practices of pedagogical chatbots in higher education. Chatbots have the potential of tackling challenges, such as the difficulty of educators to do course evaluations in a formative manner or to promote communication and collaboration amongst the students. Even though chatbots appear in several applications in the last decade, their implementation in higher education is still in its infancy. Digital learning communities (cMOOCs) will be set up for knowledge sharing among educators, so as to motivate the implementation of pedagogical chatbots for improving the quality of education in Europe.

 $\mathbb{M} \land \mathbb{K} \in \mathbb{(21)}$

More information at: http://edmedia.rise.org.cy/

ASSESS

The ENTER Knowledge Alliance project builds on the idea that education is an unpredictable industry. If one is launching a startup in the Educational Technology (EdTech) niche, s/he needs to be prepared for the specific challenges that will face while attempting to enter into this market. At the same time the EdTech industry has exploded on a massive extent; the competition is huge and to stand out one must be unique in multiple ways. The ENTER project is at the forefront of this challenge, by improving the quality of entrepreneurship education around EdTech, bringing together academic and industrial partners with entrepreneurial experience and with expertise in educational technologies and learning pedagogies, aiming to empower undergraduate & postgraduate students, faculty members, researchers, educators as well as university alumni to become EdTech entrepreneurs.

More information at: http://edmedia.rise.org.cy/

EDUBOTS

Assessment of these higher-order skills is not easy, particularly within these open-ended environments where students create unique solution paths to problems, interact with peers, and act in both the physical and digital worlds. Currently, digital technologies offer novel methods and solutions to assess the 21st-century skills and offer insights to learners' efforts and achievements that become available for both learners and researchers. Thus, the goal of this project is to provide, pilot and validate novel assessment methods and tools intended to use for the assessment of 21st-century skills. The assessment solutions will be piloted in different learning contexts but focused on maker spaces (schools and nonformal ie the maker spaces will be either currently located in Schools or will be nonformal spaces whose programmes engage with School groups).

More information at: https://www.cyprusinteractionlab.com/assessmake-21-2020-2022/

[Research projects]

- selected ongoing projects -



YICY2020 – Climate KIC Young Innovators 2020 – Climate KIC; January 2020 – December 2020; Grand No: 200491 aims to support secondary and high school students to develop their 21st century skills and competences related to climate innovation, under the umbrella of Problem Based Learning (PBL) pedagogy. Among other competencies, the project promotes systems thinking and analysis, critical thinking, creative complex problem-solving and entrepreneurship. The project's consortium includes the Cyprus University of Technology (Lead Partner), the Cyprus Energy Agency and the Centre for Systems Solutions in Wroclaw- Poland.

More information at: https://yicy2020-ck.cyprusinteractionlab.com



FeSTEM aims to promote an innovative method and pedagogy that will allow HE students to use traditional and computationally-rich media to create meaningful, shareable exhibits that will act as mentoring models for encouraging girls and women to remain active in STEM. The main project outcomes are foreseen to be: a gender-sensitive teaching methodology for engaging HE students in making shareable exhibits and promoting gender-equality issues, an open source online instrument for making gender-sensitive shareable exhibits, resources in the form of examples to illustrate how shareable exhibits can act as mentoring constructs for women in STEM and a mentoring community platform for STEM HE students.

More information at: https://festemproject.eu

ERUM is an Erasmus+ funded project - project number2019-1-AT01-KA203-051482 - which intends to improve the educational offer on quality of information in the field of higher education as well as the development of students' transversal competences in terms of media literacy, evidence-based communication and resilience to mis- and disinformation (or so-called "fake news").

More information at: https://projects.uni-foundation.eu/erum/

The Youth Makerspace in Larnaka is the first of its kind to be established in Cyprus. The Makerspace has been established by the Youth Board of Cyprus in collaboration with Larnaka Municipality. The Cyprus Interaction Lab received funding to manage the Makerspace and provide academic and research direction/guidance to the project. Through the Youth Makerspace young people will have access to free and specialized know-how, information and advice in their fields of interest, but also will find the support to venture in new and alternative paths for professional rehabilitation in order to bring out new business opportunities.

More information:

https://www.cyprusinteractionlab.com/projects/youth-makerspace-larnaka/



[News, Events & Highlights]



The kickoff meeting of the ERASMUS+ project FeSTEM (Female Empowerment in Science, Technology, Engineering and Mathematics in Higher Education) took place with great success on January 30-31, at the Cyprus University of Technology. FeSTEM, which is funded by the European Commission, is composed of five partners in five countries (Cyprus, Italy, Greece, Spain, Slovenia). Cyprus is represented by the Social Computing Research Centre (http://www.socialcomputing.eu) which has the responsibility for coordinating the project, with Dr. Antigoni Parmaxi as the Scientific Coordinator of the Project. The FeSTEM project includes leading universities and research centres with a distinguished research activity in the fields of science and education: the Smart Mobile Interactive Learning Environments (SMILE, http://smile.uom.gr/) Laboratory of the University of Macedonia, the CESIE Research Center (https://cesie.org/en/), the Geoss Educational Organization (www.ic-geoss.si) and two industrial partners: Magenta Consultoria (www.magentaconsultoria.com) and ARIS (http: //www.ariscy.com/).

February 2020

EIT Climate-KIC: Kick-off meeting and training workshop in Paris, France.







On Wednesday and Thursday, February 12-13th 2020, the project kick-off meeting took place at the Center of Research and Interdisciplinary (CRI), in Paris, France. The meeting was hosted by the central EIT Climate-KIC Young Innovators 2020 team. Our core team from Cyprus participated in the two – days training meeting which was divided into two main parts.

Part 1: The first day of the training consisted of introduction presentations about the general aims of the Young Innovators-Climate-KIC projects. The training covered the philosophy and the processes that the core design EIT Climate-KIC team of Young Innovators 2020 followed to end up in the proposed toolbox of participatory tools.

Part 2: The second day was a hands-on experience training workshop! In particular, the participants from the partner countries were divided in groups and worked collaboratively on a given problem related to climate challenge. Utilizing a different participatory tool from the toolbox, each was called to frame the problem, exchange ideas, state arguments, present pros and cons of the possible solutions in order to propose the most doable ones. A mentor from the core design team guided each group all along the process, pushing them to think more creatively and widely!

[News, Events & Highlights]

January-March 2020

Immersive VR for Learning Physics in the High Schools of Cyprus

From January 27th until March 4th 2020, CYENS's CoE EdMEdia group and the Cyprus Interaction Lab worked with more than 140 high school students in Cyprus to enable innovative learning experiences in Physics lessons. The students engaged in an inquiry using a VR simulation, with a mission to answer questions related to the Special Theory of Relativity. Immersive VR allowed the students to make several space travels and understand physical phenomena such as time dilation and the length contraction.

The students expressed their enthusiasm for the inquiry-based learning experience and for the use of the VR simulation, which allowed them to study the Special Theory of Relativity in a more fun, experiential and interactive way.

April 2020 ASKFOOD: Workshop on "Innovative teaching methods in food science"

Dr. Andri Ioannou (Associate Professor, Director of the Cyprus Interaction Lab & Coordinator of the EdMedia MRG) was invited at the 3rd meeting of the Erasmus+ KA2 project ASKFOOD, which took place on April 14th-16th 2020, at the Cyprus University of Technology.

During the project meeting, Dr. Ioannou delivered a successful workshop on "Innovative teaching methods in food science; examples from practice". As part of the workshop she introduced the Research Center on Interactive Media, Smart Systems, and Emerging Technologies (RISE) and work of the EdMedia MRG, providing examples of digital games and game-based simulations in the context of food science.





EIT Climate-KIC Young Innovators programme - Teacher training

Stage 1 (Teacher training) of the EIT Climate-KIC Young Innovators programme was successfully completed on Tuesday 30th of June 2020.

The training sessions were designed and delivered by members of the teams of the Cyprus University of Technology (CUT) and the Cyprus Energy Agency (CEA) with the support of with the support of CYENS CoE Research Centre of Excellence in Cyprus focusing on Interactive media, Smart systems and Emerging technologies.

A total of 21 secondary education teachers participated in the training. They come from private and the public schools and have various teaching specializations (e.g. Geography, Science, Chemistry, Biology, Design & Technology). Our trained teachers plan to implement the programme with their students during the upcoming September/October (Stage 2 of YI Cyprus).





June 2020

[News, Events & Highlights]

July 2020

SUGAR: Innovative technologies can be a bridging between citizens and authorities







The project Sustainable Urban Governance through Augmented Reality (SUGAR – sugar.cyprusinteractionlab.com) has been successfully completed, responding to the key question: whether innovative technologies, and in particular augmented reality can help planning authorities that are looking for more efficient ways to involve the citizens in the decision-making process as well as citizens who want to have a say in the development of their urban environment.

The research team having concluded the study, emphasizes that achieving procedural transparency and cultivating trust between authorities and citizens are the main factors that will determine the success of any consultation process. The project showed that technology through its capabilities to visualise urban space in three dimensions allows the public to effectively interact and explore the environment without restrictions and takes the discussions away from pre-defined and carefully selected rendered views of a polished final product. The application developed under the project in conjunction with the sustainable urban governance action framework created by the project team, is based on building a platform of open communication between authorities and the public using a common vocabulary, tools and environment.



ERUM is an Erasmus+ funded project. It is carried out by university partners from Cyprus, France, Greece, Lithuania, Luxembourg and Spain under the coordination of the University of Vienna (Austria) and focuses on the question how universities and media professionals can work together and learn from each other to improve the quality of information amidst changing and dynamic flows of information. Within the project, various events will bring together journalists, researchers and students. In addition, freely accessible materials such as reports, guidelines and open educational resources for higher education institutions will be produced.

As we are one year into the project, we decided it is about time to look back at the milestones that could already be achieved despite the current COVID-19 crisis and give an outlook on what is yet to come in the forthcoming months. Have a look at our first Newsletter here: https://bit.ly/34Agreq

[Featured Publications]

IN 2020, THE CYPRUS INTERACTION LAB HAS PUBLISHED A TOTAL OF 26 PAPERS IN PROMINENT JOURNALS AND CONFERENCES. FOR A FULL LIST OF OUR PUBLICATIONS, PLEASE VISIT OUR GOOGLE SCHOLAR PAGE https://tinyurl.com/jb4efd9. BELOW YOU CAN FIND DETAILS OF A SELECTION OF OUR 2020 PUBLICATIONS.



TECHNOLOGY-ENHANCED EMBODIED LEARNING

The enactment of embodied learning in the authentic classroom introduces new challenges. The educational system has yet to develop a clear vision or learning design models that would guide the implementation of embodied learning using digital technologies and manipulatives. This study presents an example of a learning design for technology-enhanced embodied learning in an authentic classroom. Three forms of physical embodiment (direct, surrogate and augmented) are enacted using a model consisting of a single educator and rotating across learning stations. The case study takes place in a multidisciplinary lesson around historical information. In this lesson, Year 4 primary school students (i) take virtual tours among the ruins of Archaic kingdoms using mobile VR headsets, (ii) use programmable floor robots to learn about the various occupations people had back then and (iii) create storyboards based on historical information using web-based digital tools. The study evaluates the technology-enhanced embodied learning experience from the perspective of the learners. Data from 34 students demonstrate learning gains, as well as positive perceptions of the learning experience in terms of their relationship with their teammates, their sense of personal development, and the overall classroom orchestration. We conclude with lessons learnt, limitations and suggestions for future work. With this study, we aim to spark a dialogue on how technology-enhanced embodied learning can be successfully enacted in real-world classrooms, highlighting the need for more studies in the intersection of technology, design and pedagogy.

Ioannou, Marianna, and Andri Ioannou. "Technology-enhanced Embodied Learning: Designing and Evaluating a New Classroom Experience." Educational Technology & Society 23, no. 3 (2020)

[Featured Publications]



DESIGN STUDENTS MEET INDUSTRY PLAYERS: FEEDBACK AND CREATIVITY IN COMMUNITIES OF PRACTICE

This work investigates the social collaboration and creative outcomes of teams of learners in Higher Education (HE) Design studies, in the context of cross-organizational (university/industry) Communities of Practice (CoP). These refer to groups of people who share a common interest in a field and connect to co-create knowledge. The study focuses on the feedback delivered by the industrial members of the CoP through collaboration technologies, to complement academic feedback. Findings have shown a twofold effect on learners. On the one hand, critical feedback on the deliverables increased both the time-pressure and the complexity of the work, affecting the teams' perception of their performances. On the other hand, feedback appeared to inspire better creative outcomes while improving the teams' metacognitive activity and learning regulation. Furthermore, it enabled learners to pragmatically realize their status within the broader geography of professional practice and reconfigure their achievement goals accordingly. These findings confirm the contribution of cross-organizational CoPs in HE and are discussed with reference to the CoP theory and modes of belonging, as fundamental for learning and identity evolution.

Aekaterini Mavri, Andri Ioannou, Fernando Loizides, Design students meet industry players: Feedback and creativity in communities of practice, Thinking Skills and Creativity, Volume 37, 2020.



DEVELOPING, ENACTING AND EVALUATING A LEARNING EXPERIENCE DESIGN FOR TECHNOLOGY-ENHANCED EMBODIED LEARNING IN MATH CLASSROOMS

The turn of the millennium has witnessed an increased interest in technology-enhanced embodied approaches for learning in mathematics due to the rapid advancement of motion-based technologies. However, the emergence of technology-enhanced embodied learning brings to the foreground new challenges due to the lack of learning experience (LX) designs, ensuring its successful introduction in real classroom settings. This paper presents a large-scale study on the implementation and systematic evaluation of a LX design, developed and enacted by a cohort of eight primary education teachers to support their students' engagement and learning in mathematics. The LX design was structured around an embodied educational app for learning in mathematics and was implemented in 13 primary education classrooms (n = 213 children).

Analysis of the data collected via pre-post conceptual tests, students' engagement surveys and testimonials, as well as teachers' interviews, provided empirical substantiation to the LX design, while also supporting the effectiveness of technology-enhanced embodied learning.

Georgiou, Y., Ioannou, A. Developing, Enacting and Evaluating a Learning Experience Design for Technology-Enhanced Embodied Learning in Math Classrooms. TechTrends (2020).

[Contact us]

POSTAL ADDRESS

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LOCATION

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