5TH INTERNATIONAL CONFERENCE
ON MEDICAL EDUCATION INFORMATICS

MEI 2024 | 10-11 JUNE | Thessaloniki | GR

Conference Programme

&

Book of Abstracts

Editors

Panagiotis D. Bamidis, Stathis Th. Konstantinidis


INTERNATIONAL CONFERENCE
MEI
2024
MEDICAL
EDUCATION
INFORMATICS
10-11 JUNE 2024
THESSALONIKI
GREECE
2024


virtual worlds
an Open Access Journal by MDPI


SimS


ΕΕΕΚΔ
ΕΤΑΙΡΕΙΑ ΕΡΕΥΝΑΣ
ΚΑΙ ΕΚΠΑΙΔΕΥΣΗΣ
ΚΑΛΙΝΙΚΩΝ ΔΕΞΙΟΤΗΤΩΝ


eCAN
Strengthening eHealth for
Cancer Prevention & Care


FORTH


PECAN
Partners of Experience in Cancer


www.Bio-Tech.gr
Bio-Tech
ΒΙΟΙΑΤΡΙΚΗ ΤΕΧΝΙΚΗ ΥΠΟΣΤΗΡΙΞΗ
Συστήματα εκπαίδευσης στην Ιατρική
Ακρωτηρίου 70 Χανιά Κρήτη 73133 T: 28210-94637 F:28210-87616
www.Bio-Tech.gr E: Info@Bio-tech.gr


ΕΛΕΒΙΤ


Gaumard®
Simulators for Health Care Education


E.M.BI.E.E.
B.R.E.S.U.
ΕΙΔΙΚΗ ΜΟΝΑΔΑ ΒΙΟΪΑΤΡΙΚΗΣ
ΕΡΕΥΝΑΣ ΚΑΙ ΕΚΠΑΙΔΕΥΣΗΣ
BIOMEDICAL RESEARCH AND
EDUCATION SPECIAL UNIT

Conference Programme
&
Book of Abstracts

---

of the

5th International Conference on

Medical Education Informatics

June 10-11, 2024

Aristotle University of Thessaloniki,

Thessaloniki, GR

Editors:
Panagiotis D. Bamidis, Stathis Th. Konstantinidis

Technical Assistance:
Afroditi Tzortzi

Publisher: Lab of Medical Physics and Digital Innovation, School of Medicine, Aristotle University of Thessaloniki, Greece

ISBN: 978-960-243-750-6

Cover Message

We welcome you to Thessaloniki and the 5th International Conference on Medical Education Informatics – MEI 2024, which is jointly organised by the School of Medicine of the Aristotle University of Thessaloniki (Greece) and the School of Health Sciences of the University of Nottingham (UK).

MEI 2024 brings together researchers and practitioners in the multi-disciplinary areas of Medical/Health Education, patient education and engagement, Open Education, educational technology and technology enhanced learning, Artificial Intelligence in Health Education, Simulation and new pedagogical approaches in Health Education.

MEI2024 is already the 5th International Conference, following a nice tradition which started back in 2012 and which features a triennial event organisation pattern.

The theme for this year is "Empowering Health Education: Digital Transformation Frontiers for all". Therefore, MEI2024 is framed by various workshops supported by numerous projects like FOR21 (https://for21.eu/), SIMS (https://sims-project.eu/), eCAN (https://ecanja.eu/), PeCAN (https://imedphys.med.auth.gr/project/partners-experience-cancer-pecan), SHIFT-HUB (https://shift-hub.eu/), CareBridge (https://imedphys.med.auth.gr/project/carebridge) and others.

It is also complemented by two key satellite events, namely, 2nd SHIFT- HUB Conference - Smart Health Innovation & Future Technologies Conference as well as, the 1st Panhellenic Symposium on Simulation in Medical Education. The latter also features innovative and interactive educational sessions like the MedSimContest 2024, a competition for undergraduate healthcare students in clinical simulation scenarios, and Escapathon 2024, the first escape room design marathon calling participants to competitively collaborate in designing puzzles, riddles, activities and spaces for creating a medical education escape room.

These proceedings provide a testimony of the experiences collected during MEI2024, with the hope that a little stone of research and good practice is put on the multifaceted wall of medical education technology, innovation and change.

Enjoy reading!

The conference chairs

Panagiotis Bamidis

Stathis Th Konstantinidis

Organising Committee

Panagiotis Bamidis, Aristotle University of Thessaloniki, GR
Eleni Dafli, Aristotle University of Thessaloniki, GR
Panagiotis Antoniou, Aristotle University of Thessaloniki, GR
Maria Nikolaidou, Aristotle University of Thessaloniki, GR
Stathis Konstantinidis, University of Nottingham, UK
Savvas Anastasiadis, Aristotle University of Thessaloniki, GR

International Steering Committee

Panagiotis Bamidis, Aristotle University of Thessaloniki, GR
Daniela Giordano, Universita degli studi di Catania, IT
Stathis Konstantinidis, University of Nottingham, UK
Costas Pattichis, University of Cyprus, CY
Terry Poulton, Saint George's, University of London, UK

International Programme Committee

Victor Arce, University of Santiago de Compostela, SP
Konstantinos Bikos, Aristotle University of Thessaloniki, GR
Charalambos Bratsas, International Hellenic University, GR
Jonathan Darling, Leeds Institute of Medical Education, UK
Lyubima Despotova-Toleva, Plovdiv Medical University, BG
Konstantinos Diamantis, Aristotle University of Thessaloniki, GR
Leontios Hadjileontiadis, Aristotle University of Thessaloniki, GR
Stylianos Hatzipanagos, University of West London, UK
Debbie Holley, Bournemouth University, UK
Nikos Fachantidis, University of Macedonia, GR
Klas Karlgren, Karolinska Institute, SE
Demetris Koutsouris, National Technical University of Athens, GR
Hooi Min Lim, University of Malaya, MY
Faisal Mushtaq, University of Leeds, UK
Kostas Papadopoulos, University of Macedonia, GR
Sokratis Papageorgiou, National and Kapodistrian University of Athens, GR
Apostolos Papalois, Biomedical Research and Education Special Unit, GR
Iraklis Paraskakis, South East European Research Centre, GR
Jools Symons, Leeds Institute of Medical Education, UK
Pavlos Sarafis, Hellenic Open University, GR

Eirini Schiza, CYENS Centre of Excellence, CY
Dimitris Stamovlassis, Aristotle University of Thessaloniki, GR
Pascal Staccini, Universite Nice Sophia Antipolis, FR
Chin Hai Teo, University of Malaya, MY
Stefanos Triaridis, Aristotle University of Thessaloniki, GR
Ioannis Tsougkos, University of Thessaly, GR
Lefteris Thireos, Athens Medical Society, GR
Heather Wharrad, University of Nottingham, UK
Richard Windle, University of Nottingham, UK
Luke Woodham, Saint George's, University of London, UK

1st Panhellenic Symposium on Simulation in Medical Education

Organising Committee

Eleni Dafli, Aristotle University of Thessaloniki, GR
Emmanouil Smyrnakis, Aristotle University of Thessaloniki, GR
Varvara Fyntanidou, Aristotle University of Thessaloniki, GR
Vassilis Grosomanidis, Aristotle University of Thessaloniki, GR
Evangelia Savvidou, Aristotle University of Thessaloniki, GR
Maria Moirasgenti, Aristotle University of Thessaloniki, GR
Panagiotis Bamidis, Aristotle University of Thessaloniki, GR

Scientific Committee

Daniel Rey Aldana, Fundation Semergen, SP
Magda Gavana, Aristotle University of Thessaloniki, GR
Evangelia Gkougkoudi, University of Cyprus, CY
Nikos Kadoglou, University of Cyprus, CY
Gesthimani Mintziori, Aristotle University of Thessaloniki, GR
Ioannis Koutelidakis, Aristotle University of Thessaloniki, GR
Sergio Cinza Sanjurjo, Fundation Semergen, SP
Nikos Stefanopoulos, University of Patras, GR
Areti Triantafyllou, Aristotle University of Thessaloniki, GR
Zoi Tsimtsiou, Aristotle University of Thessaloniki, GR
Athina Tatsioni, University of Ioannina, GR

Conference Programme

Monday 10th June

	Amphitheater I	Amphitheater II	Amphitheater III	Foyer
9.00- 9.30	Registration			
9.30-9.50	**WELCOME** **Chairs of the 5th International Conference of Medical Education Informatics: Prof P. Bamidis, Aristotle University of Thessaloniki & Prof. S. Konstantinidis, University of Nottingham** **Mr. Y. Shkvyra, Consul of Ukraine in Thessaloniki, Greece** **Prof. S. Triaridis, Head, School of Medicine, Aristotle University of Thessaloniki**			
9.50 - 10.30	**Keynote 1 - Amphitheater I:** **AI for generating engaging learning experiences** **Prof. Symeon Retalis** **Chair: Prof. S. Konstantinidis**			
10.30 -11.30	Virtual Reality applications - Chair: P. Antoniou A medical education platform for authoring and running virtual reality scenarios based on 360 videos *Panagiotis David, Vasileios Papageorgiou, Konstantinos Tagaras, Eleni Dafli, Panagiotis Bamidis, Panagiotis Antoniou* A Medical Animation-Based Platform for Basic and Advanced Electrocardiography and Cardiac Electrophysiology *Dimitrios Stakos, Michalis Mytaras* Virtual reality experiential education in dentistry: Development and multifaceted evaluation of an interactive simulation of a mandibular molar extraction in a 3D environment *Vasileios Papageorgiou, Panagiotis Antoniou, Panagiotis Bamidis* QuPath Edu and OpenMicroanatomy: Open-source virtual microscopy tools for medical education *Aaron Ylä-Hallila, Peter Bankhead, Mark Arends, Petri Lehenkari, Sanna Palosaari*	SimS: Simulation medicine and Scenario-based learning for emergency care I - Chair: I. Popova Digital OSCE: Experience of Odesa National Medical University *Yuriy Petrovskiy, Oleksandr Rogachevskyi, Valery Marichereda* Enhancing the quality of emergency care in Ukraine through the use of scenario-oriented simulation education as a problem-based approach tool *O. Rogachevskyi, M. Pervak* Experience for implementation of grant projects outcomes into the educational process *Serhii Sazhyn* Forms of improving the quality of training at ONMedU in the conditions of a mixed training format: scenario-orientational simulation training in emergency care. *Tetiana Orabina, Kateryna Usychenko*	Empowering healthcare professionals, patients and caregivers towards telemedicine in cancer care: The eCAN training program - Chair: S. Spyrou Part1 The workshop will introduce a new curriculum, specifically designed to facilitate adoption of telemedicine for cancer and prepare stakeholders for its use By invitation only	
11.30-12.00	Coffee break			
12:00-14:00	AI in Healthcare Education - Chair: E. Rigas The potential role and limitations of Artificial Intelligence and ChatGPT in anatomy education *Nikolaos Mantzou, Trifon Totlis* Enhancing Anatomy Education through an AI-Powered Virtual Reality Auditorium *Panagiotis Antoniou, Konstantinos Tagaras, Panagiotis Bamidis* The role of chatbot technology in medical education for Parkinson's Disease *Georgios Koutalios, Vasileios Paraschos, Efstathios Sidiropoulos, Panagiotis Bamidis* Digitalised Healthcare Education - Chair: K. Diamantis Empowering students in co-creating eLearning resources through a virtual hackathon *Hooi Min Lim, Chin Hai Teo, Wei-Han Hong, Yew Kong Lee, Ping Yein Lee, Chirk Jenn Ng* How to Scale-up High-Quality Medical Education with Recent Technological Advancements? *Anja Yvonne Bischof, Telemachos Hatziisaak, Simone Kraehenmann, Tobias Kowatsch* VHEalthLab – creating open access virtual labs for the common Biology curriculum *Stella Nicolaou, Eleni Dafli, Persoulla Nicolaou, Panagiotis Bamidis, Gabriel Lazar, Blanca Puig, Yiota Mylona* CVRiculum A Pan University Program Using Virtual Reality As a Medium to Teach Empathy *Eva Peisachovich* The Effect of Embodiment on Pseudo-Haptics for Psychomotor Skills Development in Immersive Virtual learning Environments *Sandy Abdo, Bill Kapralos, KC Collins, Adam Dubrowski*	SimS: Simulation medicine and Scenario-based learning for emergency care II - Chair: R. Zatsepin Impact of international collaboration and grant projects for medical MEI in Ukraine in times of a full-scale military invasion *Iryna Popova, Tetiana Bilous, Igor Gerush, Volodymyr Khodorovskyi, Tetiana Antofichuk* NAIA and «Erasmus+» cooperation *Volodymyr Kodii, Dmytro Antonkov, Rostyslav Zatsepilin, Andrii Zapototskyi* Scenario-Based Learning and Virtual Patients *Maryna Dolzhenko, Yeliena Trofymovych* Simulation and modeling in tactical medicine: experience of implementing the SimS project at the Dnipro State University of Internal Affairs *Oksana Mysliva, Stanislava Myroniu* Simulation Training for Junior Medical Staff in Emergency Pediatric Care During Conflict: Insights from Ukraine *Oleksii Godovanets, Olena Korotun, Oksana Godovanets, Tetiana Shchudrova, Ruslan Knut* The importance of Conducting Simulation Scenarios in the Education of Medical University Students *Maryna Dolzhenko, Yeliena Trofymovych, Yuliya Volkova, Kateryna Volchenko* CareBridge - Chair: E. Konstantinidis Introduction to CareBridge: Equiping Healthcare Providers And Caregivers With Information On The Patient's Functional Status And Cognitive Abilities Through The Continuum Of Care	Empowering healthcare professionals, patients and caregivers towards telemedicine in cancer care: The eCAN training program - Chair: A. Billis Part 2 In this part participants may put their hands-on the first module of the designed curriculum Open to all conference participatns	Hands-on Workshop: Virtual Reality in Abdominal Surgery Training *Facilitator: George Xatzakis*
14.00 - 15.00	Lunch (including coffee)			
15:00 - 15:45	**Keynote 2 - Amphitheater I:** **Enhancing Medical Education through Augmented Reality** **Prof. Hrisovalantis-Ioannis Tsougos** **Chair: Prof. E. Papanastasiou**			
15:45 - 16:45	FOR21: Fostering the doctor of the 21st century: Education for patient-centered communication I Chairs: E. Poulton, P. Semenikhina A Survey of the Effectiveness of Using a Virtual Patient in the Training of Medical STUDENTS *Gulnara Khudaykulova, Sevara Mirkhamidova, Djakhangir Tursunov, Shoira Atabekova, Polina Semenikhina, Anastassia Rodina-Theocharaki, Ella Poulton* Assessment of preliminary results on statistical data from a conducted survey on students' communication skills. *Alma Baatjies, Sanna Palosaari, Rustam Yussupov, Eva Braidwood, Anar Tursynbekova* Evaluation of the quality of teaching resources for the Patient-Centered Communication Skills Program: preliminary results *Anastassia Rodina-Theocharaki, Maria Nikolaidou, Polina Semenikhina, Sholpan Kaliyeva, Ella Poulton, Jools Symons, Panagiotis Bamidis* Pedagogical toolkit for self-study in medical communication *Anna V.Vozdvizhenskaya, Nataliya G. Koroleva*	Escapathon 2024 - The first Escape Room design marathon, where participants will competitively collaborate in designing puzzles, riddles, activities and spaces for creating a medical education escape room. Winning teams will be awarded! - Chair: N. Kyriakidis	The PECan Final Event: Empowering Patient Involvement in Cancer Research (In Greek) - A groundbreaking collaboration among cancer patients, medical students/early-stage researchers and healthcare professionals with the Living Lab Community - Chair: D. Mantzari	
16:45 - 17:00	Streach break			
17:00 - 18:00	FOR21: Fostering the doctor of the 21st century: Education for patient-centered communication II - Chairs: J. Symons, A. Rodina Theocharaki Instructors' Digital Competences in the Teaching of Patient-centered Communication: Impact of the FOR21 Project *Eva Braidwood, Magdalini Liontou, Sanna Palosaari, Petri Kulmala* Integration of OpenLabyrinth, Moodle and Padlet online resources for teaching patient-centered communication skills *Polina Semenikhina, Gulshat Kemelova, Dinara Aimbetova, Sholpan Kaliyeva, Larissa Matsiyevskaya, Symbat Khalmuradova, Anastassia Rodina-Theocharaki, Petri Kulmala, Eva Braidwood* Study on the Efficacy of Implementing the Motivational Interviewing Discipline in a Medical University *Sanam Madaliyeva, Daulet Kyzhyrov, Fatima Bagiyarova, Anastasia Rodina-Theocharaki, Ella Poulton* Innovative educational technologies: what can we learn from the FOR21 project and how can we make the results sustainable? *Poulton Ella, Anne Reid, Jools Symons, Anastasia Rodina-Theocharaki, Maria Nikolaidou, Fatima Bagiyarova, Zarrina Babamuradova, Sholpan Kaliyeva, Gulnara Khudaykulova, Panagiotis Bamidis*	Escapathon 2024 - Cont'd	The PECan Final Event: Empowering Patient Involvement in Cancer Research (In Greek) - Cont'd	
18:00	Reception & Traditional Greek Dances			

MEI 2024 | 10-11 June | Thessaloniki | GR – 5th International Conference on Medical Education Informatics

Tuesday 11th June

	Amphitheater I	Amphitheater II	Amphitheater III	Foyer
9:00-9:45	**Keynote 3 - Amphitheater I:** **The journey from analogue to intelligent digital medicine** **Prof. Shafi Ahmed** **Chair: Prof. P. Bamidis**			
9.45 - 10:30	2nd SHIFT-HUB Conference Smart Health Innovation & Future Technologies Conference - Chair: A. Koumpis Welcome & Introduction to SHIFT-HUB satelite event Policy Makers' Panel: National Strategies Discussion Joint Actions for Digital Health and the European Health data Space *Dr. S.S. Spyrou* Joint Action for Cancer - The European Comprehensive Cancer Centre Network (EUnetCCC) *Anastasia Balassopoulou* The need to measure effectiveness: tools stemming from Joint Actions *Panos Stafylas*	1st Panhellenic Symposium on Simulation in Medical Education - Chair: E. Smyrnakis Invited talk: Enhancing Simulation Training with Mixed-Reality *Mr Carlos Chidiac MD*		Master Class on patient-centered communication skills with Standardised Patients *Facilitators: Jools E Symons, Anastassia Rodina-Theocharaki, Maria Nikolaidou, Cassie Reynold-Aralji, Joannie Tate, Naseem Akram, Polina Semennikhina, Fatima Bagiyarova, Alma Baatjes, Gulnara Khudaykulova, Gefsi Mintziori*
10:30-11:00	Introduction to SHIFT-HUB project – Chair: Alice Seim (S2i) The SHIFT-HUB vision to tackle current smart health challenges: Paul Stefanut (BOOSTER) SHIFT-HUB Games and Educational Resources: Nadja Dokter (Ippocrate AS), Elisio Costa (UPORTO) SHIFT-HUB Community: Gabriele Casalini (EDSA)	Simulation-based training in comprehensive physical examination skills using a high-fidelity patient simulator prior to real patient encounters: A novel initiative for undergraduate medical students in Greece *Evangelia Savvidou, Stefanos Koukouliatas, Georgios Zachariadakis, Athanasia Sandali, Maria Moirasgenti, Maria Deligianni, Eleni Dafli, Panagiotis Stachteas, Emmanouil Smyrnakis* Enhancing Empathy in Healthcare through Virtual Reality Training: A Novel Approach to Medical Education *Sofia E Reppou, Anne Marie Reid, Trudie E Roberts, Panagiotis D Bamidis*		
11:00-11.30	**Coffee Break**			
11:30-13:00	2nd SHIFT-HUB Conference Smart Health Innovation & Future Technologies Conference - Chair: D. Petcu Panel Innovation and Research in Clinical Environments: Overcoming Challenges for the Future of Healthcare– powered by CareBridge Panelists: Stelios Hadjidimitriou, PhD, Senior Researcher at Signal Processing & Biomedical Technology Unit AUTH | Digital Biomarkers and AI-enabled Healthcare Michael Doumas, Professor, Director of the 2nd Propaedeutic Internal Medicine Clinic of Ippokrateio General Hospital of Thessaloniki Adriane Thrash, Managing Partner, Anthology Ventures Apostolia Karabatea, R&D Project Manager, Gnomon Informatics SA On innovation ecosystems and their value for today's European Research Area *Alice Seim, Karoline Haack, Adamantios Koumpis* Benefits for target groups: Some lessons learned from the SHIFT-HUB project *Sorina Lalolu(Mitroi), Alice Seim, Karoline Haack, Adamantios Koumpis*	1st Panhellenic Symposium on Simulation in Medical Education - Chair: E. Dafli Invited talk: AV Technologies for Health Sciences and Healthcare Spaces Οπτικοακουστικές τεχνολογίες για Επιστήμες Υγείας κ χώρους φροντίδας υγείας *Alexandros Psitos, TELMACO* Panel Experiences from Simulation in medical education in Greece Εμπειρίες από την προσομοίωση στην ελληνική ιατρική εκπαίδευση (in Greek) 1. Clinical Skills Lab and Patient Simulation at Aristotle University of Thessaloniki, School of Medicine Κλινικές Δεξιότητες και Προσομοίωση Ασθενών στην Ιατρική ΑΠΘ *E. Smyrnakis* 2. Simulations and Clinical skills at Cyprus University Medical School Προσομοίωση και κλινικές δεξιότητες στην Ιατρική του Πανεπιστημίου Κύπρου *E. Gkougkoudi* 3. Initial attempts for a simulation programme at the University of Thessaly Medical School Αρχικές προσπάθειες για την οργάνωση προγράμματος προσομοίωσης στην Ιατρική του Παν. Θεσσαλίας *I.C. Tsougos* 4. Opening of the Medical Simulation Centre at "Evangelismos Hospital", Athens Έναρξη Λειτουργίας του Κέντρου Ιατρικής Προσομοίωσης στον "Ευαγγελισμό" *I. Vasileiadis* 5. From symptom to diagnosis: The perspective of Clinical Simulation Από το σύμπτωμα στην διάγνωση: Η προοπτική της Κλινικής Προσομοίωσης *P. Angelogianni* 6. Use of high-fidelity simulators in healthcare training. Experiences from the Greek National Emergency Aid Centre Χρήση των προσομοιωτών υψηλής πιστότητας στην εκπαίδευση των υγειονομικών. Η εμπειρία του ΕΚΑΒ *V. Dimitropoulou-Delimente* 7. The educational experience of the Nursing Simulation Laboratory of the Nursing Department of the University of Patras Η εκπαιδευτική εμπειρία του Εργαστηρίου Νοσηλευτικής Προσομοίωσης του Τμήματος Νοσηλευτικής του Πανεπιστήμιου Πατρών *N. Stefanopoulos*	Training aspects in Digital Health - Chairs: A. Athanasiou, A. Astaras Sensor data fusion based on Electrical Impedance Spectroscopy for Dermatological Diagnosis: the DermaSense prototype scanner *Ramo ina, Thomai Chatzidaniil, Anastasios Nikiforidis, Christina Kemanetzi, Eirini Kyrmanidou, Elisabeth Lazaridou, Alexandros Moraitopoulos, Panagiotis Bamidis, Alexander Astaras* EDSS Identification in Multiple Sclerosis Patients Using Fitbit Wearable Data: Leveraging Regression and Classification of Real-World Data for Informed Clinical Decision-Making *Theologos Kyrou, Alexandros Moraitopoulos, Alexandra Anagnostopoulou, Georgios Petridis, Antonios Billis, Ioannis Nikolaidis, Nikolaos Grigoriadis, Panagiotis Bamidis, Charis Styliadis* A Normative SEMG Database for Upper Limb Biometric Comparisons in Rehabilitation Research *Athanasios Arvanitidis, Konstantinos Mitsopoulos, Vasiliki Fiska, Vasiliki Mantziou, Theodore Savvidis, Diamanto Mylopoulou, Kalliopi Mpeiza, Panagiotis Bamidis, Alkinoos Athanasiou* A prototype automated version of the Action Research Arm Test (ARAT) for assessing upper extremity performance using the YOLO computer vision algorithm for real-time object detection *Ariton Veselinoski, Konstantinos Kasimis, Alkinoos Athanasiou, Alexander Astaras* Assessing perception of wearable robotics in rehabilitation by the biomedical technology audience: insights from a ThessRoboGlove (TRG) Forum workshop *Spyros Nikolopoulos, Markos Tsipouras, Panos Polygerinos, Kostas Nizamis, Vasiliki Fiska, Konstantinos Mitsopoulos, Paschalina-Danai Sarra, Alkinoos Athanasiou, Panagiotis Bamidis, Alexander Astaras*	
13:00-14:00	**Lunch (including coffee)**			
14:00-14.30	2nd SHIFT-HUB Conference Smart Health Innovation & Future Technologies Conference - Chairs: A. Seim, A. Papachristodoulou SHIFT-HUB Entrepreneurial Discovery Workshop Welcome and introduction	Invited talk: How to design an advanced medical simulation scenario Dr. Daniel Rey Aldana Chair: E. Gkougkoudi	Digitalise Healthcare Education II - Chair: Hooi Min Lim "To err is human". Simulation training improves clinical practice and patient safety. *Vagia Evgeniou, Ioannis Korakianitis, Eirini Schizas, Nikolaos Kadoglou, Evangelia Gkougkoudi* Navigating the Future of Healthcare: The Role of the ManagiDITH Master Program in Shaping Digital Innovators Konstantinos Diamantis, Maria Nikolaidou, Savvas Anastasiadis, Vasiliki Pavlidou, Vasiliki Kalfa, Panagiotis Bamidis	
14.30-16.00	Panel Discussion Exploring Central Macedonia's Opportunities for Smart Health Participants: Eri Toka Costas Tramantzas Dimitris Kourtesis/Nikos Tsoniotis Pantelis Natsiavas Nikos Athanasopoulos Open Discussion with Audience SHIFT-HUB Opportunities: Yiannis Geragotellis (KINNO) SHIFT-HUB Networking	MEDSIM Contest: a competition for undergraduate healthcare students in clinical simulation scenarios	Navigating the Digital Transformation in Higher Education: Assessing Undergraduate Students' Digital Skills at Aristotle University of Thessaloniki *Ioanna Dratsiou, Konstantinos Diamantis, Panagiotis Bamidis, Bilkis Konstantinou* Are immersive 360-Degree Interactive Video suitable for Educating Midwifery Students About Breastfeeding? *Maram Alammary, Lesley Halliday, Stathis Konstantinidis* Using the RE-AIM implementation science framework to evaluate eLearning object implementation in Malaysian universities *Hooi Min Lim, Chin Hai Teo, Yew Kong Lee, Ping Yein Lee, Sazlina Shariff Ghazali, Nurul Amelina Nasharuddin, Phelim Voon Chen Yong, Wei Hsum Yap, Stathis Konstantinidis, Heather Wharrad, Chirk Jenn Ng* Resilience Training for Medical Students in Spatial Computing Environments: Towards a Scoping Review *Anja Yvonne Bischof, Helen Galliker, Simone Kraehenmann, Janna Hastings, Tobias Kowatsch* The Use of Virtual OSCES in Undergraduate Medical Education: a Scoping Review *Munira Farah*	MEDSIM Contest: a competition for undergraduate healthcare students in clinical simulation scenarios
16:00-16:15	**Refreshing break**			
16:15-17:30	**Awards & Closing Ceremony**			

Conference Abstracts

DAY ONE

Keynotes

Keynote 1 - AI for Generating Engaging Learning Experiences

Chair: S. Konstantinidis

Prof. Symeon Retalis

University of Piraeus, Greece

The advent of artificial intelligence in education presents unprecedented opportunities to revolutionize teaching and learning. In this keynote presentation, we will delve into how AI can empower educators to craft pedagogically effective and highly engaging learning environments. Today's educators face the demanding task of creating lessons that not only impart knowledge but also foster critical thinking and cater to diverse learning needs. AI tools offer invaluable support by enabling teachers to design interactive sessions that integrate learning content across multiple representations, from text and video to interactive simulations.

Contrary to common misconceptions, AI is not merely a tool for plagiarism or simple question-answering. Instead, it holds the potential to generate rich, multimodal learning resources that can elevate the educational experience. AI can help tailor content to meet specific learning needs, thereby creating more personalized and effective learning pathways.

This presentation will advocate for a balanced and cautious approach to integrating AI in education. By understanding and leveraging the strengths of AI, educators can enhance their teaching practices, making learning more engaging and effective. We should embrace the AI wave, with thoughtful implementation and oversight, since it can lead to a more dynamic and inclusive educational system that truly benefits learners and supports educators in their critical roles.

Keynote 2 - Enhancing Medical Education through Augmented Reality

Chair: E. Papanastasiou

Prof. Hrisovalantis-Ioannis Tsougos

University of Thessaly

This talk focuses on the integration of AI and VR technologies to create comprehensive training programs that cover a wide range of medical disciplines and support lifelong learning.

AI-powered virtual patients in VR simulations provide highly responsive and interactive training experiences, while real-time feedback helps students learn from their mistakes and improve their performance. This combination drives innovation in medical education, encouraging new teaching methods and tools, and meet specific educational needs in an innovative and unique way. Overall, AI and VR enhance the efficiency and effectiveness of medical training, ultimately leading to better patient care and outcomes.

Virtual Applications

Chair: Panagiotis Antoniou

A medical education platform for authoring and running virtual reality scenarios based on 360 videos

Panagiotis David [1], Vasilis Papageorgiou [1], Konstantinos Tagaras [1], Eleni Dafli [1], Panagiotis D. Bamidis [1], Panagiotis E. Antoniou [1]

[1] Lab of Medical Physics and Digital Innovation, School of Medicine, Faculty of Health Sciences, Aristotle University of Thessaloniki, Thessaloniki 541 24, Greece

Background: Advances in medical education for improved patient care require innovative ideas that incorporate modern technological innovations. This work presents a scenario based learning platform for authoring and running 360 video based healthcare educational scenarios in immersive virtual reality.
Methods: This platform comprises two parts, one web based authoring app and another one for playing the authored cases in VR headsets. The authoring app allows uploading of 360 or 2d videos, images and audio files, for use as resources in the scenarios. Each case contains interaction nodes, with multiple links to one another, creating a cohesive branching virtual scenario. Nodes are enriched with 360/2d video, image or audio file. The platform was deployed on an Ubuntu server and used MongoDB with the API written in PHP. The headset deployable, VR case player, was developed in the Unity game engine. It communicates with the backend using API requests returning JSON strings that are consumed in the player allowing the user to experience the content and select the direction of the educational scenario.
Results: The platform was presented in a train-the-trainers session of the Aristotle University of Thessaloniki where qualitative feedback was garnered. Medical educators of the Medical School of the University provided positive feedback. The consensus was that the platform is promising for proliferating VR education, with several medical teachers expressing strong interest to author cases for their classes in the platform.
Conclusion: Future endeavors will focus on updating the platform's capabilities, evaluating its effectiveness and expanding on its accessibility to reach a wider audience.

A Medical Animation-Based Platform for Basic and Advanced Electrocardiography and Cardiac Electrophysiology. Comparing Efficiency and Performance Using Different Methods of Project Delivery

Dimitrios Stakos [1], Michalis Mytaras [2]

[1]Democritus University of Thrace, Alexandroupolis, Greece
[2]Medical Illustrator and Animator, MSc in Medical Visualisation and Human Anatomy, University of Glasgow

Background: Medical animation (MA) is ideal for illustrating and presenting complex concepts of cardiac electrophysiology. We created a MA-based platform for teaching basic electrocardiography and cardiac electrophysiology in medical students and present our experience on the efficacy of this platform.
Methods: This is a 40-episodes, 3D animation project comprising aspects of cell physiology, clinical electrocardiography and mechanisms of cardiac arrhythmias. Since 2020, the project is continuously delivered to 7th semester students (2020, n=130; 2021, n=134; 2022, n=131). In 2020 the project was presented using the e-class platform of our University after uploading one episode at a time. No interactions were possible between students, creators and animations. In 2021, all episodes were presented in class, facilitating active, bidirectional interaction (pause, slow motion). Moreover, the project launched online (https://www.youtube.com/@meducatestudio/videos) allowing repeated viewing. In 2022, a booklet was also distributed containing key points of each episode. The performance and the efficiency of the project were assessed at the end of the semester with written exams and questionnaires.
Results: The greatest efficacy in delivering a comprehensive knowledge of the topic was observed in the 3rd period (ANOVA, $P<0.05$), possibly driven by the potential to repeatedly interact with the animation and the booklet key points. Interestingly, the project presentation during the first period did not add significantly compared to previous methods of teaching (power point static graphics, P=NS).
Conclusion: In person presentation, repeated viewing as well as guided interaction (key points), strengthened active learner involvement and significantly enhanced the performance of the project in undergraduate student.

Virtual reality experiential education in dentistry: Development and multifaceted evaluation of an interactive simulation of a mandibular molar extraction in a 3D environment

Vasileios Papageorgiou, Panagiotis Antoniou, Panagiotis D Bamidis

Laboratory of Medical Physics & Digital Innovation, School of Medicine, Faculty of Health Sciences, Aristotle University of Thessaloniki, Greece

Background: Tooth extraction requires a both theoretical understanding as well as manual and decision making skills for the surgical procedure itself and the management of complications. Experience gained from performing a large number of such procedures is essential, however the capacity to practice in a safe and educationally conducive environment is invaluable before practical training.
Methods: This work presents the outcomes of an educational virtual reality 360 video environment teaching students the procedure for tooth extraction. The scenario implemented contained all necessary steps and manipulations must be performed, starting with the administration of anesthesia and ending in the successful extraction of a tooth. The simulation operator can make choices regarding the selection of appropriate tools, administration of drugs, identification of anatomical points in the mouth for tool application, and decision-making for managing complications or emergencies.
Results: The application was evaluated by a group of 10 fourth-year students from the School of Dentistry at Aristotle University of Thessaloniki. The students reported positive experiences with the virtual reality training and acknowledging its usefulness as an educational tool that prepared them for real-world clinical practice. They highlighted the ability to learn in a risk- free environment and to receive immediate feedback as key benefits.
Conclusion: This 360 video based virtual reality environment allowed students to develop their skills in a safe and controlled setting, which is essential for building confidence and proficiency in dental procedures. Further work will expand on the results of this approach that shows promise as an innovative and effective means of training future dentists.

QuPath Edu and OpenMicroanatomy: Open-source virtual microscopy tools for medical education

Aaron Yli-Hallila [1], Peter Bankhead [2,3], Mark J Arends [3], Petri Lehenkari [1,4] and Sanna Palosaari [1,4]

[1] Translational Medicine Research Unit, Medical Faculty, University of Oulu, Finland
[2] Centre for Genomic & Experimental Medicine, Institute of Genetics and Cancer, University of Edinburgh, Edinburgh, UK
[3] Edinburgh Pathology and CRUK Scotland Centre, Institute of Genetics and Cancer, University of Edinburgh, Scotland, UK
[4] Medical Research Center Oulu, University of Oulu and Oulu University Hospital, Oulu, Finland

Background: The importance of artificial intelligence and virtual microscopy in medical education and clinical practice is growing, prompting educators to prepare future medical professionals for these technologies. Existing software typically focuses on either anatomical training or AI and quantitative analysis, not both. To bridge this gap, we enhanced QuPath, a leading digital pathology tool (https://qupath.github.io/), with the QuPath Edu extension and the complementary OpenMicroanatomy web platform.
Methods: QuPath Edu transforms QuPath into an intuitive microanatomy learning platform. Alongside, OpenMicroanatomy, a web-based platform provides access to QuPath Edu's content. These tools offer features like annotated slide tours, multimedia, and quizzes, enhancing the learning experience. The first public versions of QuPath Edu and OpenMicroanatomy were released in August 2023 (https://openmicroanatomy.github.io/).
Results: QuPath Edu has been used in training basic histology to over 1200 medical and dentistry students at University of Oulu. In addition to the traditional benefits of virtual microscopy like collaborative learning and easy access, QuPath Edu provided a platform for doctoral training exercises in quantitative image analysis. The introduction of QuPath Edu and OpenMicroanatomy has enabled educators to deploy innovative training material across a variety of educational settings, fostering essential multidisciplinary skills in students.
Conclusion: The integration of QuPath Edu and OpenMicroanatomy into educational settings addresses the need for versatile tools that combine traditional histology education with modern digital analysis techniques. This unique approach not only enhances student engagement and learning outcomes but also prepares them with the multidisciplinary skills necessary for the evolving field of medical practice.

SimS: Simulation medicine and Scenario-based learning for emergency care I

Chair: I. Popova

Digital OSCE: Experience of Odesa National Medical University

Yuriy Petrovskiy [1], Oleksandr Rogachevskyi [1], Valery Marichereda [1]

[1] Odesa National Medical University, Odesa, Ukraine

Background: Organizing objective structural examination (OSCE) requires much effort in preparation and carrying it out. Most of the work requires much synchronization between different departments of the university. In this report, we want to share our experience in implementing the digital version of the OSCE in Odesa National Medical University (ONMedU).
Methods and Results: In collaboration with the software company, we created a digital product "Perquisite Exam" for performing all exam-related procedures – from managing the list and content of the examined competencies and creating exam tasks to final exam reporting and giving results to the examinees right after they completed the final station. We do not show station grades during exams to examinees nor to examiners to reduce the effect of the grade on further examination and to reduce corruption-related issues. We have full control over the exam data: from recording surveillance video and the examiner's reaction to the examinee's actions to calculating quality metrics for each exam question. This allows accurate measuring of all the aspects of exam-related processes.
Conclusion: Using the digital platform for all stages of OSCE greatly improves and speeds up the examination process while allowing full quality control during the whole examination process.

Enhancing the quality of emergency care in Ukraine through the use of scenario-oriented simulation education as a problem-based approach tool

O. Rogachevskyi [1], M. Pervak [1]

[1] Odesa National Medical University, Odesa, Ukraine

Background: The study aims to evaluate how scenario-oriented simulation training affects the dynamics of changes in the professional competence development indicators of applicants for higher medical education in emergency care.
Materials and methods: The investigation was conducted using emergency simulation scenarios in May and June of 2023. Fifty-nine sixth-year students from three different groups in three different faculties attended the courses. In simulations, each student had to assess the necessity and worth of medical and resuscitation procedures. Following a debriefing, the students' management decisions were reviewed. Data on the participants' performance in the simulation was gathered using questionnaires and objective assessment criteria. A knowledge exam, a pre-test, a post-test immediately following the simulation, and a post-test three months later comprise this assessment. Students answered five knowledge questions, and their responses were to be turned in to see how the questions had changed between surveys. A pre-made mark sheet was then used to assess the responses.
Results: The students' confidence in all of the measured skills rose dramatically after the simulation, and this gain lasted for three months. After the training, all students' confidence levels for all abilities examined improved considerably ($21.8 \pm 1.33\%$, $p < 0.001$), and after three months, they stayed virtually at the same level ($19.14 \pm 1.54\%$, $p < 0.001$). After three months, the survival rate of knowledge was $18.8 \pm 1.71\%$.
Conclusion: The results show how beneficial and effective this teaching method is for the Ukrainian higher medical education system. It highlights that more research is necessary to figure out how to integrate simulation situations into the teaching and learning process most effectively.

Experience for implementation of grant projects outcomes into the educational process

Serhii Sazhyn [1]

[1] Bukovinian State Medical University, Chernivtsi, Ukraine

Background: Bukovinian State Medical University (BSMU) has been an active participant in educational grant projects since 2015. One of the first grant projects was TAME (Training Against Medical Error) within the framework of the ERASMUS+ EACEA. The project outcomes was creation and adaptation clinical scenarios on models of virtual patients were implemented in educational process in senior students of specialty “Medicine”.
Materials and Methods: The project UDCR “Virtual learning resources for clinical reasoning training at Ukrainian health school” provided access to the scientific and pedagogical staff of the BSMU to the CASUS platform where 200 clinical scenarios translated and adopted into Ukrainian and successfully implemented in the following disciplines like cardiology, family medicine, pediatrics etc.
Results: Participation in these projects led to the development of an elective course “Modern practices – virtual patient” for senior students. Currently, the university is the coordinator of the Simulation Medicine and Scenario-Based Learning for Emergency Care project (SimS), which provides for the creation of clinical scenarios on virtual patient models to improve the competencies of medical, educational and police personnel in providing emergency care for persons from the category "First on the scene".
Conclusions: We are going to develop a new elective course "First on the scene (emergency aid course)" for students of various specialties of the field of knowledge "Health care". Thus, participation in grant projects allows implementing the novel technological practices into the educational process with the aim of improving the level of general and professional competences to achieve better program learning outcomes.

Forms of improving the quality of training at ONMedU in the conditions of a mixed training format: scenario-oriented simulation training in emergency care

Tetiana Orabina [1], Kateryna Usychenko [2]

[1] Bogomolets National Medical University, Kyiv, Ukraine,
[2] Odessa National Medical University, Odesa, Ukraine

Background: In the conditions of a full-scale Russian invasion, a combination of distance and face-to-face learning formats is necessary under the mandatory conditions of preserving the unity of the educational space, ensuring equal access to quality education.
Materials and Methods: At Odessa National Medical University, in the course of the Erasmus+ KA2 project "Simulation Medicine and Scenario-based Learning for Emergency Care (SimS), we implemented 35 scenarios of various emergencies in the educational process of the 6th-year students of the medical faculty, which are offered to the student of the medical faculty during the practical classes. The assessment of the quality of training in the provision of emergency medical care was carried out using a questionnaire before the start of the scenario-oriented simulation training course and after its completion.
Results: 90% of the surveyed students answered that they had increased confidence in their skills in providing emergency aid and the level of understanding of the algorithm of actions in various circumstances that require immediate action by a doctor. 87% of respondents would recommend this course to their fellow students while 91% would like to continue scenario-oriented simulation training in face-to-face format.
Conclusions: The training of future doctors requires the implementation of innovative approaches, scenario-oriented simulation training allows you to effectively reproduce the real conditions of future practical activities.

eCAN

Chair part I: S. Spyrou
Chair part II: A. Billis

Empowering healthcare professionals, patients and caregivers towards telemedicine in cancer care: The eCAN training program

The eCAN Joint Action (JA) focuses on strengthening the use of eHealth in cancer prevention and care, by setting the scene for the widespread of telemedicine. To do that, the JA emphasizes the need for empowerment of end-users towards relative technologies. This workshop will introduce the new curriculum, specifically designed to facilitate adoption of telemedicine and prepare stakeholders for its use. During the first half, **an invitation-only session (Part 1)** will present the materials to project-related stakeholders and realize a train-the-trainers workshop designed specifically for the needs of the JA. During the second half of the workshop, **an open-to-all session (Part 2)** will present the eCAN JA to interested parties and give the opportunity to participants to try hands-on the first module of the designed curriculum. The aim of the workshop is to present the training program and collect experts' feedback before its launching. The aim of the training program is to facilitate empowerment towards coping strategies, shared decision making, patients' rights, communication training, assessing psychosocial needs, having difficult discussions etc.

AI in Healthcare Education

Chair: E. Rigas

The potential role and limitations of Artificial Intelligence and ChatGPT in anatomy education

Nikolaos Mantzou [1], Trifon Totlis [2]

[1] School of Medicine, Faculty of Health Sciences, Aristotle University of Thessaloniki, Greece
[2] Department of Anatomy and Surgical Anatomy, School of Medicine, Faculty of Health Sciences. Aristotle University of Thessaloniki, Greece

Background: Artificial Intelligence (AI) is already making an impact on almost every aspect of our life. This presentation investigates whether and how AI and Generative Language Model may be helpful in improving anatomy education. Anatomy education has left behind in terms of adaptation with the current trends of learning, relying mainly on exhaustive textbooks and images. Modern trends include virtual dissection tables, 3D interactive platforms, 3D models, virtual and augmented reality applications. Furthermore, AI

rapid evolution has provided Generative Language Models such as the ChatGPT, which are able to produce text in a conversational tone.
Methods and Results: In our first study, we made a conversation with ChatGPT including 18 anatomy-related questions, exploring its capabilities in question replying, providing detailed explanations of complex anatomical terms, and generating multiple-choice quizzes. In the second study, the consistency of ChatGPT replies on 6 anatomy-related questions was investigated in 4 different timepoints
Conclusion: In conclusion, ChatGPT has certain limitations, such as inaccuracies, unclear citation sources and inability to provide images. It cannot replace human education. However, ChatGPT is a valuable interactive tool which may supplement anatomy education providing useful explanations, concise summaries and quizzes. It can also increase students' engagement and interest in anatomy and personalize learning.

Enhancing Anatomy Education through an AI-Powered Virtual Reality Auditorium

Panagiotis E. Antoniou [1], Konstantinos Tagaras [1] and Panagiotis D. Bamidis [1]

[1] Laboratory of Medical Physics and Digital Innovation, School of Medicine, Faculty of Health Sciences, Aristotle University of Thessaloniki

Background: The rapid evolution of tools used in medical education has brought several disruptive technologies together. One such promising integration is that of artificial intelligence and virtual reality (VR). VR offers an unrivalled sense of presence, multiplying the effectiveness of demonstrative educational applications. In anatomy education, specifically, three-dimensional anatomical models can provide the learner with unprecedented spatial understanding of structural configurations in the human body. Adding an AI powered chatbot assistant transforms this into a novel personal, or collaborative educational space. This work aims to present the technical implementation and first results of an AI supported VR anatomy auditorium for surgical and neuro anatomy.
Materials and Methods: The AI powered Virtual Anatomy auditorium was developed using the Unity game engine. It is a VR environment, featuring a simple menu that users can utilize to view 3d anatomical models with annotations in each surgical and neuro anatomy lesson. The OpenAI application programming interface was used to link the environment with OpenAI's large language model and Meta's framework was implemented for speech-to-text-to-speech operation. Thus, users can ask natural language questions and receive educational responses in the VR auditorium.
Results: The AI supported VR anatomy auditorium has been presented to 2nd semester students of Medicine in the Aristotle University of Thessaloniki. Qualitative feedback from this pre-pilot has been extremely positive with students identifying the potential of this application for both lecture based and self-directed learning activities.
Conclusion: These promising results remain to be further explored in a planned pilot study utilizing this environment for problem based teaching of neuroanatomy.

The role of chatbot technology in medical education for Parkinson's Disease

Georgios Koutalios [1] , Vasileios Paraschos [1] , Efstathios Sidiropoulos [1], Panagiotis Bamidis [2]

[1] Anaptixiaki Meletitiki Voriou Ellados, Thessaloniki, Greece
[2] Lab of Medical Physics and Digital Innovation, School of Medicine, Aristotle University of Thessaloniki, Greece

Background: Chatbots emerged in the mid-20th century with advancements in Artificial Intelligence and Natural Language Processing. They evolved into sophisticated conversational agents that generate more human-like answers and revolutionize communication and customer service. Medical chatbots constitute a groundbreaking advancement in the field of healthcare, especially in healthcare education, that offer many benefits for the users, including easy accessibility, portability, affordance and efficient support for everybody. These chatbots have the ability to act as automated, patient-centric and personalized conversational agents, designed to promote healthcare and to aid the user in information acquisition and education at any time and place.
Materials and Methods: In this work, our team focused on creating a chatbot for medical education and healthcare that will be used in a mobile application and will be able to help the patients by offering detailed instructions of proposed assessments and at the same time providing, in an interactive way, a big variety of material and information related to the Parkinson's Disease, including the causes, common symptoms, treatments and every day activities the patients can try.
Conclusion: Our goal is to provide, with a touch of human-like connection and empathy, educational content to the patients, especially the elderly, in order to help them get a better understanding of Parkinson Disease and how they can have a better quality of life with the disease.

Digitalised Healthcare Education

Chair: K. Diamantis

Empowering students in co-creating eLearning resources through a virtual hackathon

Hooi Min Lim [1], Chin Hai Teo [1,2], Wei-Han Hong [3], Yew Kong Lee [1,2], Ping Yein Lee [2], Chirk Jenn Ng [1,4,5]

[1]Department of Primary Care Medicine, Faculty of Medicine, Universiti Malaya, Kuala Lumpur, Malaysia
[2] E-Health Unit, Faculty of Medicine, Universiti Malaya, Kuala Lumpur, Malaysia
[3] Medical Education & Research Development (MERDU), Faculty of Medicine, Universiti Malaya, Kuala Lumpur, Malaysia
[4] Department of Research, SingHealth Polyclinics, Singapore
[5] Duke-NUS Medical School, Singapore

Background: Engaging students as co-creators is beneficial, leading to better engagement and academic performance as students take ownership of the learning experience. However, challenges to engaging students as creators include the lack of clear processes, students feeling threatened or uncomfortable with an unfamiliar role and power relations between students and teachers. We report an innovative approach to engaging students as co-creators in reusable learning object development by using a virtual hackathon and the evaluation outcomes of this approach.
Materials and Methods: During the hackathon, students were divided into groups to create storyboards on topics about patient safety using the online MURAL platform. The groups presented their storyboards to a panel of judges at the end. We used a pre-post questionnaire survey method and open-ended questions to

evaluate students' knowledge, confidence levels and perceptions in co-creation. A total of 22 medical and nursing students and 14 mentors participated in the hackathon.
Results: There was an increasing trend in students' knowledge and confidence levels in co-creation after the hackathon. For the qualitative results, students expressed their enthusiasm to be co-creators. They liked the interaction with educators and enjoyed the teamwork between students and educators in co-creating storyboards. Students expressed that they embraced the use of eLearning materials to enhance their learning. They were keen to carry out more self-directed learning using technology to strengthen their learning experience.
Conclusion: In conclusion, co-creation using the hackathon method can be a fun and creative approach to promote and enhance student-educator partnerships in eLearning resource development.

How to Scale-up High-Quality Medical Education with Recent Technological Advancements?

Anja Y. Bischof [1], Telemachos Hatziisaak [1] & Simone Kraehenmann [1,2], Tobias Kowatsch [1,3,4]

[1] School of Medicine, University of St. Gallen, St. Gallen, Switzerland
[2] Cantonal Hospital St. Gallen, St.Gallen, Switzerland
[3] Institute for Implementation Science in Health Care, University of Zurich, Zurich, Switzerland
[4] Department of Management, Technology, and Economics, ETH Zurich, Zurich, Switzerland

Background: Due to a substantial shortage of medical doctors in many countries, instructors face the question of how to scale-up high-quality medical training opportunities regarding clinical reasoning and social skills. Moreover, medical students also need to learn tools to strengthen their resilience to proactively cope with stressors in real-world clinical practice. Recent technological advancements offer novel opportunities for instructors and students alike. We are, therefore, interested to learn from these stakeholders how technology can be used to improve competency-based medical education.
Methods: In the first step, we employ the Nominal Group Technique to gather ideas from faculty members (medical educators and instructors) on how to use technology to improve their curriculum and teaching activities. In a second step, we will ask medical students how technological advancements can meet their learning needs. Thematic maps will be derived for each step and qualitatively compared.
Preliminary results: Initial findings informed by 27 faculty members highlight three key areas of improvement: (1) developing a learning platform with features like progress testing, dynamic adaptations to learning status, and individual mentoring controlled by artificial intelligence; (2) utilizing spatial computing and gamification to digitize case studies for enhanced knowledge transfer; and (3) fostering automated generation of examination questions to increase question variability and push self-testing as the most efficient learning strategy.
Conclusion: Three ideas have been tentatively identified. Preliminary results will be further enriched by the perspective of medical students. The findings will inform the revision of how medical education curricula will be implemented in the future.

VHEalthLab – creating open access virtual labs for the common Biology curriculum

Stella A. Nicolaou [1], Eleni Dafli [2], Persoulla Nicolaou [1], Panagiotis Bamidis [2], Gabriel Lazar [3], Blanca Puig [4], Yiota Mylona [5]

[1] University of Nicosia,
[2] Aristotle University of Thessaloniki, Thessaloniki, Greece
[3] Ascendia SA, Bucharest, Romania
[4] University of Santiago de Compostela, Santiago de Compostella, Spain
[5] Ministry of Education Sports and Youth

Background: Health-related undergraduate programs typically include core courses like Biology that contain a laboratory component. This is essential for developing key skills such as technical proficiency, knowledge acquisition, and critical thinking. The pandemic has highlighted challenges in delivering laboratory-based education, prompting the need for innovative teaching approaches. VHEalthLab is an ERASMUS+ funded cooperation initiative project that aims to enhance Biology laboratory education across the EU. The overarching goal of the project is to design and create online open-access interactive biology Virtual Labs (VLs) that can be used in Health Sciences as away to substitute/support face-to-face lab experiences.
Methods: This is an innovative project that will decipher the 'Common Biology Lab' curriculum to increase usability. The e-learning platform that will be designed will be one of the first to offer open-access VLs in general Biology, specifically tailored for higher education (HE). Further, the VLs will incorporate scenarios and authentic learning activities to support teaching practices in both HE, while also enhancing students' skills. The platform will integrate social media features and serve as a key driver for modernizing Science education in HE across Europe. Additionally, it will include hands-on activities to empower academics to design and implement lab-based courses within their programs. Notably, the VLs will be translated in four languages: English, Greek, Spanish, and Romanian.
Conclusion: In conclusion, embracing advanced technological methods can empower educators to implement pedagogical changes effectively. VHEalthLab aims to standardize and enhance Biology laboratory education, making it more accessible and effective through the use of VLs and comprehensive pedagogical support. Technology-based education, particularly when personalized through game-informed and technology-supported educational tools, can address the challenges of delivering new curricula, overcome pandemic-related obstacles, and support teacher professional development within this demanding context.

CVRriculum A Pan University Program Using Virtual Reality As a Medium to Teach Empathy

Eva Peisachovich [1], Lora Appel [1]

[1] York University, Toronto, Canada

Background: The CVRriculum study evaluated the feasibility and benefits of introducing Virtual Reality (VR) as an experiential education medium into existing courses at our university The goal was to allow students to recognize and understand new perspectives by capturing these experiences and environments using 360-degree-VR-technology.
Methods: After faculty members(n=5) attended a workshop coaching them to implement VR into their classes and coursework; a complementary online toolkit was also developed. We then recruited students (n=25) from the participating faculty's courses volunteered to be part of the study whereby instead of a traditional assignment, they would complete an alternative VR-project addressing the same learning outcomes. The study conducted included pre-post surveys with the control and experimental participants, took in-depth standardized observations throughout the semester, and upon project completion, students were asked to provide a reflection on their experience, additionally a select number of students were invited to participate in a focus group.
Results: While challenges were identified the overwhelming response was that VR integration provides a fresh perspective and that both students and educators are keen to include this novel technology as a means for EE in their future curriculums. This pilot project, equipped students with technical skills, and created an opportunity for the entire class to feel and be immersed with learning.

Conclusion: We are planning to expand the project by recruiting more faculty from diverse departments across York university, and build an online repository to house the VR-films.

The Effect of Embodiment on Pseudo-Haptics for Psychomotor Skills Development in Immersive Virtual learning Environments

Sandy Abdo [1], Bill Kapralos [1], KC Collins [2], and Adam Dubrowski [1]

[1]maxSIMhealth Group, Ontario Tech University, Oshawa, Canada.
[2]School of Information Technology, Carleton University, Ottawa, Canada.

Introduction: Pseudo-haptics uses vision and auditory cues to provide the user with the impression of the sense of touch. Recent research in pseudo-haptics is examining its application to facilitate psychomotor skill development in immersive virtual learning environments (iVLEs) including virtual simulations and serious, which typically ignore psychomotor skill development given the need for expensive haptic devices. Despite the potential, the field of pseudo-haptics in medical education is relatively new and many questions remain, including the effect of embodiment, that is, the experience of presence inside a body.
Background: We previously conducted a study that examined whether a virtual drilling task (drilling is common in medicine including orthopedic surgery) can be simulated using pseudo-haptics. However, despite the importance of embodiment to psychomotor skill development, our prior work did not include this aspect of cognition.
Methods: We conducted a study with that explored the effect of embodiment, represented by a virtual hand, coupled with pseudo-haptics. Forty participants performed a virtual drilling task in an iVLE. Participants were equally divided into two experimental groups: i) embodiment, and ii) non-embodiment. The embodiment group included a hand holding the virtual drill while the non-embodiment group did not include the hand. Participants controlled the virtual drillusing a standard computer mouse and tasked with drilling to several ranges at under various auditory conditions.
Results & Conclusions: Including a virtual hand significantly enhances the speed of acquisition of a psychomotor skill indicating the need for a virtual hand in future virtual psychomotor-based simulations when coupled with pseudo-haptics.

Simulation medicine and Scenario-based learning for emergency care II

Chair: R. Zatsepilin

Impact of International Collaboration and grant projects for medical HEI in Ukraine in Times of a full-scale military invasion

Iryna Popova [1], Tetiana Bilous [1], Igor Gerush [1], Volodymyr Khodorovskyi [1], Tetiana Antofiichuk [1]

[1] Bukovinian State Medical University, Chernivtsi, Ukraine

Background: Since February 2022, educators, students, and scientists of medical higher educational institutions (HEI) in Ukraine have faced challenges in preserving the educational process in times of aggressive full-scale invasion.
Materials and Methods: One of the solutions for supporting the resilience of education and science during war is active participation in grant projects through international collaboration. Starting in 2023 BSMU has been coordinating the Erasmus+ CBHE project «SimS -Scenario-based learning and virtual patients in emergency care», which for now resulted in the preparation of scenarios on emergency medical care and materials for the «First on the Spot» course, and trainings by EU experts on scenario-based learning and the «OpenLabyrinth» platform. «SimS» enabled HEIs to obtain equipment for advanced BLS practicing and to upgrade participants' skills in scenario-based learning and simulation medicine which eventually positively impacts the quality of the educational process.
Results: The gained experience is disseminated among medical specialists of various HEIs in Ukraine. Another example of an international project that provides diversity to the educational process is the EIT HIVE «Innovations of higher education institutions», which supports the development of entrepreneurship through start-up initiatives support (mentoring sessions, online educational courses) and resulted in the introduction of a selective discipline onentrepreneurship in medicine for senior students which has diversified the studying trajectoryfor students and showed positive feedback by conducted polls.
Discussion: International collaboration within grant projects has provided a valuable impact on the resilience and sustenance of medical education and dissemination of global educational experiences in Ukraine.

NAIA and «Erasmus+» cooperation

Dmytro Antonkov [1], Volodymyr Kodii [1], Rostyslav Zatsepilin [1]

[1]National Academy of Internal Affairs, Kyiv, Ukraine

Background: During the invasion into Ukraine, Education Institutions faced an urgent need to ensure the quality of training and increase the professional skills, in particular in the area of first aid provision. The National Academy of Internal Affairs (NAIA) participates in the «Erasmus+» project with the aim of improving theoretical knowledge and acquiring new practical skills to optimize the educational process for training security specialists, based on the use of international standards, which should contribute to mastering the skills of providing first aid to persons injured during the aggressor's actions and accidents.
Methods: The participation in the «Erasmus+» project provided an opportunity to share experience on saving the lives in combat conditions for military doctors, combat medics and volunteers as well as to determine the further cooperation with partners and obtain access to medical educational programs of the EU countries for NAIA.
Results: During missile attacks and intensive assaults an important task is to improve the skills of first aid provision. The scenario-based training on a virtual victim makes it possible to avoid mistakes with a real victim and professional first aid provision is the main direction of unconditional participation in the further «Erasmus+» project and serves as the main factor in saving the lives of the wounded.
Conclusion: The NAIA aims to continue to actively cooperate with partners from the European Union, join other «Erasmus+» projects and improve professional skills in the field of pre-medical care.

Scenario-Based Learning and Virtual Patients

Maryna Dolzhenko [1], Yeliena Trofymovych [1]

[1] Kharkiv National Medical University, Kharkiv, Ukraine

Background: One innovative application of scenario-based learning is the use of virtual patients. Virtual patients are computer-based simulations that mimic real-life clinical scenarios, allowing medical students and healthcare professionals to practice diagnosing and treating patients in a safe and controlled environment.
Methods: There are several benefits to using scenario-based learning with virtual patients. First and foremost, it provides learners with hands-on experience that they may not otherwise have access to. By interacting with virtual patients, learners can gain practical skills and confidence before working with real patients. Additionally, scenario-based learning with virtual patients allows for repetition and practice, which is essential for skill development. Learners can revisit scenarios multiple times, trying out different approaches and learning from their mistakes.
Results: This iterative process helps to reinforce learning and improve proficiency.
Moreover, virtual patients provide a standardized experience for all learners. Each learner can encounter the same scenarios, ensuring consistency in training and evaluation. This also allows educators to track and assess learners' progress more effectively.
Conclusion: In conclusion, scenario-based learning with virtual patients is a valuable tool for healthcare education. By engaging learners in realistic clinical scenarios, this approach enhances learning outcomes, promotes critical thinking, and improves clinical skills. As technology continues to advance, virtual patients offer a promising avenue for training the next generation of healthcare professionals.

Simulation and modeling in tactical medicine: experience of implementing the SimS project at the Dnipro State University of Internal Affairs

Myslyva Oksana [1], Myroniuk Stanislava [1]

[1] Dnipro University of Internal Affairs, Dnipro city, Ukraine

Background: The war in Ukraine has underscored the necessity for practical competencies in delivering emergency medical aid to the wounded in crisis and combat conditions. The field of education faced significant challenges pertaining to a shortage of proficient instructors, condensed training periods, and outdated curricula misaligned with contemporary exigencies. This led to the need for an online learning of a new level of perception and unification in accordance with the best global standards.
Methods: At our university, practicing tactical medicine skills was facilitated through scenario modelling and trauma (injury) simulation. Participation and training in the international consortium of the SimS project under the Erasmus+grant, enables us to develop, implement, and refine game-based instructional methods, exemplified by labyrinths tailored to diverse pre-medical and tactical medical scenarios.
Results: The efficacy of such theoretical training, evidenced by labyrinth scenarios, manifests in enhanced knowledge assimilation during the practical training of skills and abilities in scenario-oriented classes, as well as the augmented motivation among students. Labyrinth scenarios serve as platforms for visualizing emergency aid algorithms, incorporating diagrams, photographs, videos, hyperlinks to web-based resources, and the regulatory and legal framework in this field. Engaging with labyrinthine learning not only expands the boundaries of the educational space but also learn different categories of higher education applicants (civilian, military, police officers) at their convenience, practising the algorithm and medical techniques during classes under instructor guidance.
Conclusion: This obviously contributes to the educational process so far at our university, but thanks to the ERASMUS + program, it will be disseminated to other educational institutions.

Simulation Training for Junior Medical Staff in Emergency Pediatric

Care During Conflict: Insights from Ukraine

Oleksii Godovanets [1], Olena Korotun [1], Oksana Godovanets [1], Tetiana Shchudrova [1], Ruslan Knut [1]

[1] BSMU, Chernivtsi City, Ukraine

Introduction: In the context of ongoing conflict in Ukraine, the provision of adequate emergency medical care to children assumes greater importance. Simulation training has emerged as a promising method to equip junior medical staff with essential skills. This study examines the distinctive characteristics of simulation training for junior medical staff in providing emergency pediatric care during wartime.
Methods: A mixed-methods approach was employed, combining structured interviews with junior medical staff and observational analysis of simulation training sessions conducted in selected hospitals across conflict-affected regions of Ukraine. Participants were selected through purposive sampling, ensuring representation from various healthcare facilities.
Results: Junior medical staff expressed appreciation for the hands-on learning experience offered by simulations, particularly in managing pediatric trauma cases amidst conflict conditions. However, resource constraints, including limited access to specialised equipment and frequent disruptions due to security concerns, posed significant challenges to the implementation of simulation training programmes.
Conclusion: Simulation training has the potential to be a valuable tool for preparing junior medical staff to provide emergency medical care to children in conflict settings. However, in order to achieve the greatest effectiveness, it is essential that such training programmes are tailored to address resource limitations and security concerns. Further research and investment in simulation training infrastructure is also warranted to ensure the continuous development of pediatric emergency care capabilities amidst ongoing conflict.

The importance of simulation scenarios in the education of medical university students

Maryna Dolzhenko [1], Yeliena Trofymovych [1], Yuliya Volkova [1], Kateryna Volchenko [1]

Kharkiv National Medical University, Kharkiv, Ukraine

Introduction: One of the learning methods in medical education that has gained popularity in recent years is the use of simulation scenarios. These scenarios offer students a safe environment to practice essential skills and decision-making processes, preparing them for real-world clinical situations. This hands-on experience is invaluable in preparing students for the complexities of providing medical care. Emergency medical care requires quick and effective decision-making.
Methods: Simulation scenarios challenge students to think critically and make decisions under pressure by simulating real-life scenarios. This, in turn, leads to improved patient outcomes in clinical practice. Simulation scenarios allow students to work together to achieve a common goal. Through this, students learn the importance of effective communication, teamwork and coordination, skills that are vital to success in the healthcare industry. Practicing in a controlled environment, students can identify and correct errors in healthcare delivery, ultimately improving patient safety in clinical practice. This emphasis on patient safety is a key component of medical education and instills a culture of continuous improvement among future healthcare providers.
Results: Simulation scenarios play a critical role in the education of medical students, improving clinical skills, improving problem-solving skills, and promoting patient safety.
Conclusion: As technology continues to evolve, the integration of simulation scenarios into medical education will continue to be a valuable tool for preparing students for the challenges of modern healthcare delivery. By using innovative teaching methods, educators can ensure that future generations of healthcare professionals are well-equipped to provide high-quality patient care.

CareBridge

Chair: E. Konstantinidis

Introduction to CareBridge: Equiping Healthcare Providers And Caregivers With Information On The Patient's Functional Status And Cognitive Abilities Through The Continuum Of Care

CareBridge is a project funded as a side research project initiative through the large Cascade – Pharaon project of Horizon Europe. It is based on three key pillars: (i) the development of an integrated system, to enable seamless patient monitoring at home following hospital discharges; (ii) real-world testing and experimentation to evaluate the effectiveness of the solution; and (iii) delivery of essential, user-friendly, and intuitive information to healthcare professionals and caregivers, ensuring that they have access to the critical insights they need for creating personalized plans for transitions. It is empowered by the technologies established at the Healthcare Transitions Living Lab space of Thess-AHALL (the Thessaloniki Action for Health and Well-being Living Lab) and methodologies stemming for Living Lab co-creation and participatory research.

Workshop

Hands-on Workshop: Virtual Reality in Abdominal Surgery Training

Facilitator: George Ntakakis

Laboratory of Medical Physics and Digital Innovation, School of Medicine, Aristotle University of Thessaloniki, Thessaloniki, Greece

In this hands-on workshop, participants will immerse themselves in a virtual surgical room where they can explore and use general surgery and laparoscopic instruments. They will practice performing abdominal surgeries on virtual patients, gaining valuable experience and improving their surgical skills in a realistic, simulated environment.

FOR21: Fostering the doctor of the 21st century: Education for patient-centered communication I

Chair: E. Poulton, P. Semenikhina

A Survey of the Effectiveness of Using a Virtual Patient in the Training of Medical STUDENTS

Gulnara Khudaykulova [1], Sevara Mirkhamidova [1], Djakhangir Tursunov [2], Shoira Atabekova [1], Polina Semenikhina [3], Anastassia Rodina-Theocharaki [4], Ella Poulton [5]

[1] Department of Public Health & Management, Tashkent Medical Academy, Tashkent, Uzbekistan
[2] Department of Biochemistry, Tashkent Medical Academy, Tashkent, Uzbekistan
[3] Department of Neurology, Psychiatry and Rehabilitation, Karaganda Medical University, Karaganda, Kazakhstan
[4] Medical Physics and Digital Innovation Laboratory, School of Medicine, Aristotle University of Thessaloniki, Thessaloniki, Greece
[5]Leeds Institute of Medical Education, University of Leeds, Leeds, United Kingdom

Introduction: Nowadays, the use of virtual patients in the educational process of medical universities is one of the priority technologies, as it gives students the opportunity to acquire clinical decision-making skills without the risk of harm to real patients and allows to standardize the assessment of communicative competencies. Purpose of the study: to study the opinion of students at the Tashkent Medical Academy n the use of a virtual patient (VP) in educational process.
Material and methods: As part of the implementation of the project FOR21 "Fostering the doctor of the 21st century: education for patient centered communication", we developed a VP for the situation "Refusal of vaccination against COVID-19" and conducted a survey of 60 medical students about the advantages and difficulties of using this technique.
Results: The use of a VP in training made it possible to effectively develop communication skills in the clinical situation of refusing vaccination against COVID-19. During the survey, 53 students (88.4%) indicated that this technique is more convenient than working with a patient in a real situation. Among the reasons are the fear of making a mistake when communicating with a real patient, and the possibility of re-practicing the skill. 7 students (11.7%) noted that in real practice they can encounter more professional experience.
Conclusion: Thus, the majority of students rated this approach as effective and allowing for the full development of communication skills in certain situations (refusing vaccination).
Acknowledgement: The FOR21 is a project co-funded by the Erasmus+ programme of the European Union.

Assessment of preliminary results on statistical data from conducted survey on students' communication skills

Alma Baatjes [1], Sanna Palosaari [2], Rustam Yussupov [1], Eva Braidwood [2], Anar Tursynbekova [1]

[1] Asfendiyarov Kazakh National Medical University, Almaty, Kazakhstan
[2] University of Oulu, Oulu, Finland

Background: As medical practitioners, the ability to communicate clearly, empathetically, and efficiently with patients, families, and colleagues is advantageous and essential for providing high-quality healthcare [1]. Empathy has been growing in recognition and significance in medical communication and is defined as the capacity to understand and share the feelings of another. It is integral to building therapeutic relationships and promoting patient-centered care [2]. This thesis aims to explore communication skills by focusing on empathy among medical students, therefore examining the current communication training in medical education and assessing the proficiency levels of students in various communication domains [3].
Methods: Medical students from 4 universities' General Medicine faculties were questioned using online surveys. Questionnaires were designed using five-point Likert-scale [2] to assess communication skills of basic level medical students and analyzed with IBM SPSS Viewer program.
Results: Mean-value analyses was done of assessed self-perception empathy skills of student groups from 4 partner universities. We found that students rated their empathy skills with Mean=2.159. To compare these groups of universities we conducted a non-parametric Kruskal-Wallis tests - paired t-tests for independent samples. The obtained p-value=0.01, shows statistically significant difference in the tests. Adjusted p-value shows significant difference between all universities (Karaganda and Asfendiyarov <0.01). Subsequently, we did paired samples T-Tests and some pairwise comparisons (Karaganda/Asfendiyarov, Samarkand/Tashkent). The p-values also showed significant difference (p = 0.01), while in comparison of Asfendiyarov with Karaganda, Samarkand and Tashkent is not (p = 0.3).
Conclusion: In conclusion, we proved that our preliminary data is statistically significant and can be used for further study. Deviation among the groups mean that the communication skills of students from different universities vary. This could imply that factors such as teaching methods, curriculum differences, or institutional culture may influence the development of communication skills among students. Identifying deviations can help pinpoint areas where communication training programs may need to be customized to address the specific needs of students from different educational backgrounds.
Acknowledgement: FOR21 is a Project co-funded by the Erasmus+ programme of the European Union.

References

1. David Jeffrey. Empathy, sympathy and compassion in healthcare: Is there a problem? Is there a difference? Does it matter? Journal of the Royal Society of Medicine. – 2016. - Vol. 109(12). – C. 446–452
2. Graf, J., Loda, T., Zipfel, S. et al. Communication skills of medical students: survey of self- and external perception in a longitudinally based trend study. BMC Med Educ 20, 149 (2020)
3. De Zulueta P. Compassion in 21st century medicine: is it sustainable? Clin Ethics 2013; 8: 119–128.

Evaluation of the quality of teaching resources for the Patient-Centered Communication Skills Program: preliminary results

Anastassia Rodina-Theocharaki [1], Maria Nikolaidou [1], Polina Semenikhina [2], Sholpan Kaliyeva [3], Ella Poulton[4], Jools E. Symons[4], Panagiotis Bamidis[1]

[1] Medical Physics and Digital Innovation Laboratory, School of Medicine, Aristotle University of Thessaloniki, Thessaloniki, Greece
[2] Department of Neurology, Psychiatry and Rehabilitation, Karaganda Medical University, Karaganda, Kazakhstan
[3] Department of Clinical Pharmacology and Evidence-based Medicine, Karaganda Medical University, Karaganda, Kazakhstan
[4] Leeds Institute of Medical Education, University of Leeds, Leeds, United Kingdom

Introduction: By implementing a rigorous quality evaluation process, educational institutions and content developers can ensure that developed materials meet high standards of quality, effectiveness, and accessibility, ultimately enhancing the learning experience for students. During the implementation of the Erasmus+ project FOR21:"Fostering the doctor of the 21st century: education for patient-centered communication" a set of virtual (VP) and standardized patient (SP) scenarios was created to enhance the education of medical doctors in patient-centered communication skills. This work outlines the preliminary findings derived from the quality evaluation carried out for 5 VP and 2 SP cases.
Methods: Two distinct quality evaluation surveys were developed for the VP and SP cases, aimed at teaching patient-centered communication skills. The questionnaires were then distributed to all consortium participants not directly engaged in case development. Each case was evaluated by two individuals: one affiliated with a European university partner and the other from a university partner within the same partner country.
Results and discussion: The results derived from survey for VP cases have similar evaluation scores for basic and advanced VP cases (94,72% and 94,79% respectively). Evaluation of the SP scenarios has been completed for the basic cases, revealing a score of 90,48%. These results may be attributed to the experience and expertise of the cases developers, which differs from partner to partner.
Acknowledgement: FOR21 - "Fostering the doctor of the 21st century: education for patient-centered communication", Project N0: 619037-EPP-1-2020-1-EL-EPPKA2-CBHE-JP, is a Joint Project co-funded by the European Commission through the ERASMUS+ Programme within the framework of the Capacity-Building projects in the field of Higher Education.

Pedagogical toolkit for self-study in medical communication

Anna V.Vozdvizhenskaya [1] , Nataliya G. Koroleva[1]

[1] North-Western State Medical university named after I.I. Mechnikov, Saint Petersburg, Russia

Introduction: This research is aimed at identifying the most adequate toolkit for self-study hours in medical communication in terms of (i) technological equipment, (ii) reference to curriculum, (iii) student's satisfaction. The need for this research rose from necessity to provide the most effective self-study model since it takes up 45% of academic hours for 'Communication skills' discipline at NWSMU.
Methods: Two types of self-study were compared and analyzed: virtual patient methodology (VPM) and trigger video methodology (TVM). VPM is A learning technology in which a student navigates though the lines of pre-recorded videos to train basic and advanced communication skills. TVM is an educational technique where students work with a short video with a hidden communication barrier. The task is to identify the barrier and provide ways to overcome it. The research method included three-stage questionnaire, namely: (i) IT-staff, (ii) course trainers, (iii) students (No 750).
Results and Conclusion: VPM fits self-study mode better, whereas trigger video methodology is ideal for classrooms. IT-staff and course trainers share the opinion that VPM is convenient in terms of use and service: once recorded and uploaded onto it takes minimum efforts to sustain, while providing safe environment for multiple attempts and honing the skill trained. Trigger videos due to its length (up to 3 minutes) are followed by quick and bright reactions from students. They trigger insights that are better discussed face-to-face. Students' satisfaction survey revoices the conclusions of the staff and shows high demand in application of more technological learning methods.

Escapathon 2024

Chair: N. Kyriakidis

Escapathon 2024

Escape rooms have been established as social activity that people of all ages and walks of life can have fun in. Medical education soon, also, embraced them as an active, multi-disciplinary learning modality. MEI is proud to organize Escapathon 2024, ***the first escape room design marathon***. This 10-hour event is going to invite participants of MEI2024 to ***competitively collaborate in designing puzzles, riddles, activities and spaces for creating a medical education escape room.*** All registered participants in MEI2024 can apply for participation either as single persons or as a team of 3-5 escape room designers. The participating teams will be called to brainstorm, design and create, physically, or digitally, one or a series of puzzles for a medical education escape room with a specific theme and learning objectives. Teams are encouraged to be multi-disciplinary and educationally diverse, containing at least one educator and one or more medical students. All team efforts will be presented in front of a judges panel. The top 3 efforts will receive the gold, silver and bronze escapathon award carrying.

The PECan Final Event

Chair: D. Mantziari

The PECan Final Event: Empowering Patient Involvement in Cancer Research (In Greek)

Join us for the final event of the "Partners of Experience in Cancer" (PECan) project. This session celebrates the groundbreaking collaboration among cancer patients, medical students/early-stage researchers and healthcare professionals with the Living Lab Community. Witness the presentation of co-created solutions, emerging from this unique partnership, aimed at fostering a new era in participatory cancer research. This event marks the launch of the first patient-led Living Lab, powered by the Hellenic Cancer Federation (ELLOK) with the scientific advise of the Thess-AHALL Living Lab, dedicated to advancing research, open science, and innovation in the field of cancer. The session will be conducted in Greek and is open to all.

FOR21: Fostering the doctor of the 21st century: Education for patient-centered communication II

Chair: J. Symons, A. Rodina-Theocharaki

Instructors' Digital Competences in the Teaching of Patient-centered Communication: Impact of the FOR21 Project

Eva Braidwood [1], Magdalini Liontou [1], Sanna Palosaari [2], Petri Kulmala [3]

[1] Centre for Languages and Communication Lingua, University of Oulu, Finland
[2] Translational Medicine Research Unit, Medical Faculty, University of Oulu, Finland
[3] Medical Faculty, University of Oulu, Finland

Introduction: We report on the impact of the FOR21 project on teachers' competence in utilising digital tools in the teaching of patient-centred communication skills and applying learner-centred pedagogical approaches, such as self-directed learning pathways and flipped classroom methods.
Methods: We conducted a small-scale longitudinal study to survey teachers' attitudes, practices and needs regarding the use of digital tools and learner-centred pedagogical approaches in the teaching of medical communication that ran parallel in the non-EU partner countries, Kazakhstan, and Uzbekistan, and in Finland. We collected data using two online questionnaires, the first in early 2021, the first phase of the COVID-19 pandemic, and the second in May 2024, a year after the generative AI revolution started to impact education. The respondents consisted of teachers of medical communication across the specialties in the Finnish participating university and in the newly established institutional Communication Development training Centres (CDCs) in the partner country universities (PCUs).
Results and Conclusions: The comparative diachronic analysis of the responses enables us to identify the changes in the development of the respondents' digital skills and pedagogical approaches, and assess the impact of the interventions of the FOR21 project and of the pandemic, and discern the contemporary developments in AI tools. Since the survey encouraged respondents to reflect on their own competences and needs for further training, the results enable informed decisions regarding further training needs at the various institutions for the teaching of digitally-supported, patient-centered communication.
Acknowledgement: FOR21 is a Project co-funded by the Erasmus+ programme of the European Union.

Integration of OpenLabyrinth, Moodle and Padlet online resources for teaching patient-centered communication skills

Polina Semenikhina [1], Gulshat Kemelova[1], Dinara Aimbetova [1], Sholpan Kaliyeva [1], Larissa Matsiyevskaya [1], Symbat Khalmuradova [1], Anastassia Rodina-Theocharaki [2], Petri Kulmala [3], Eva Braidwood[3]

[1]NCJSC Karaganda Medical University, Karaganda, Kazakhstan
[2]Aristotle University of Thessaloniki, Thessaloniki, Greece

[3]University of Oulu, Oulu, Finland

Background: Nowadays, medical education pays special attention to interactive teaching and learning. In order to effectively teach patient-centered communication skills, during the FOR21 project implementation ("Fostering the doctor of the 21st century: education for patient-centered communication") we developed a model integrating OpenLabyrinth, Moodle and Padlet platforms for a flipped classroom session with Virtual Patient case (VP).
Methods: The flipped classroom approach involves preliminary independent study of the educational material, then its reinforcement in classroom, and post-class activities to evaluate the mastery of the material by students. In proposed model, Padlet is used for storage of pre-class material (video lectures and relevant literature, instructions for working with a VP case, link to the OpenLabyrinth VP case to get familiar with) and post-class self-assessment questionnaire and the module page in Moodle links, to complete assignments (essays, videos) and receive feedback.
Results: This model was successfully implemented at KMU in teaching Basic and Advanced VP cases at the Center of Simulation and Educational Technologies and clinical departments for 5th, 6th and 7th year students. This comprehensive model makes class preparation easier for both teachers and students allowing them to quicker access all pre-class materials. The OpenLabyrinth introduces interactivity, increasing students' engagement while the Moodle greatly eases the collection and assessment of after-class assignments.
Conclusion: The development of new forms and models for integrating online resources may allow further improvement of methods for teaching communication skills in medical universities.
Acknowledgement: FOR21 is a Project co-funded by the European Commission within the ERASMUS+ Programme.

Study on the Efficacy of Implementing the Motivational Interviewing Discipline in a Medical University

S. H. Madaliyeva [1], D. Zh. Kyzhyrov [1], F. Bagiyarova [1], A. Rodina-Theocharaki [2], E. Poulton [3]

[1] Kazakh National Medical University by Asfendiyarov, Kazakhstan
[2] Aristotle University of Thessaloniki, Greece
[3] Leeds Institute of Medical Education, University of Leeds, United Kingdom

Background: Within the framework of the Erasmus+ FOR21 project, the implementation of new models and tools for developing communication skills among medical university students was conducted. This study presents the results of introducing a separate discipline on communication skills, titled "Interview and Physical Examination.
Methods and Results: "An elective course was formed and incorporated into the curriculum after completing the basic course on fundamental communication skills in the third year. The aim of the study was to determine the effectiveness of introducing a discipline aimed at shaping communication skills among third-year students. Fifth-year students, who had undergone training in basic and advanced communication skills, were recruited as expert researchers. The control group comprised third-year students (25 students) who had completed basic-level communication skills training, while the experimental group included third-year students (31 students) who had received instruction in the elective discipline in addition to basic-level training. A questionnaire with 9 questions was designed for the study. The initial three questions focused on gathering demographic information (age, academic year, and gender), while the subsequent six questions evaluated the level of knowledge and comprehension of specialized communication skills and motivational interviewing. In the initial phase, approximately 87% of students in the experimental group indicated a lack of knowledge regarding motivational interviewing. Following the instructional sessions on communicative competence and motivational interviewing, there was a notable increase in correct responses, with 84.8% of students demonstrating improved understanding, suggesting a significant acquisition of motivational interviewing skills. The second (control) studied group. In comparison, results

from the same course without instruction in this discipline showed that 15.8% answered "Yes," 42.1% answered "No," and 42.1% answered "Not specified, did not understand." Results from the second section of the questionnaire showed that 28.7% of students answered correctly to questions on four specific motivational interviewing topics, indicating the effectiveness of implementing the "Motivational Interviewing" discipline in the elective course.
Conclusion: The difference between the two surveyed groups of students, namely the indicators of the first group are more than 80%, and the indicators of the second group are less than 50%, in the second section of the questionnaire less than 30%, indicates the need to introduce both basic and special communication skills into the learning process modular system of compulsory education.

Innovative educational technologies: what can we learn from the FOR21 project and how can we make the results sustainable?

Ella Poulton [1], Anne Marie Reid [1], Jools E. Symons [1], Anastassia Rodina-Theocharaki [2], Maria Nikolaidou [2], Fatima Bagiyarova [3], Sholpan Kaliyeva [4], Zarrina Babamuradova [5], Gulnara Khudaykulova [6], Panagiotis Bamidis [2]

[1] University of Leeds, UK
[2] Aristotle University of Thessaloniki, Greece
[3] Kazakh National Medical University by Asfendiyarov, Kazakhstan
[4] Karaganda Medical University, Kazakhstan
[5] Samarkand State Medical University, Uzbekistan
[6] Tashkent Medical Academy, Uzbekistan

Background: Innovative educational technologies can be used to provide a more engaging and realistic way of learning in medical education. However, with the wide variety of pedagogical and technological approaches available, it is not easy to both choose and then implement them in the curriculum.
Summary of Work: As part of the EC funded FOR21 Project, four universities of CentralnAsia and three European institutions explored implementing innovative technologies in Communication skills teaching. The main goal was to enrich Communication skills module with the Patient-centred approach based on Flipped classroom pedagogy augmented with Virtual Patients and Standardised Patient methodologies.
Results: Overall, the experience was very positive for the students who enjoyed the new type of learning. Staff believed that student were more engaged in the discussions and active in their contributions.This presentation will highlight the main outcomes of these pedagogical and technological implementations in four universities during the project and outline possible directions for their sustainability.
Conclusion: The project outcomes will inform the future development of Communication skills modules in each university. In addition, the project will produce recommendations to support others in the community to develop and implement these types of innovative technologies within their own institutions.
Acknowledgement: FOR21 - "Fostering the doctor of the 21st century: education for patient-centered communication", Project N0: 619037-EPP-1-2020-1-EL-EPPKA2-CBHE-JP, is a Joint Project co-funded by the European Commission through the ERASMUS+ Programme within the framework of the Capacity-Building projects in the field of Higher Education.

DAY TWO

Keynote

Keynote 3 - The journey from analogue to intelligent digital medicine

Chair: P. Bamidis

Prof. Shafi Ahmed

Barts Health NHS Trust & Medical Realities, London, UK

Healthcare has spent the last millennium trundling, though its analogue version to discover its digital self. The talk will discuss the exponential technologies that are redefining and reimagining healthcare. Will AI replace doctors? Well, we are soon to find out.

2nd SHIFT-HUB Conference Smart Health Innovation & Future Technologies Conference - I

Chair: A. Koumpis

Policy Makers' Panel: National Strategies Discussion

Technologies and digitalization of health systems are in the forefront of research in the last decades. While general directions are formed at a European union level, all countries develop their own strategies for smart technologies and digital health for national health systems. Panelists will discuss current strategies in Greece and their harmonization with European ones, while they will offer both the different regions viewpoints and the road ahead in view of the European Health Data Space actions. Emphasis is drawn on actions dealing with best practices and policy recommendations on cancer care from running European Joint Action projects and the emerging need for quantitative measures of their effectiveness.

Joint Actions for Digital Health and the European Health data Space
Dr. S.S. Spyrou

Joint Action for Cancer - The European Comprehensive Cancer Centre Network (EUnetCCC)
Anastasia Balassopoulou

The need to measure effectiveness: tools stemming from Joint Actions
Panos Stafylas

Introduction to SHIFT-HUB project

SHIFT-HUB is a project funded by Horizon Europe and is specifically on a mission to establish a pan- European Smart Health Innovation Hub, uniting a diverse network of stakeholders across the quadruple helix dimensions. Its goal is to facilitate the development, promote the adoption, and foster the uptake of Smart Health technologies and services. Through comprehensive service offerings, including networking, matchmaking, partner identification, procurement support, funding guidance, and access to research infrastructures and scientific expertise, SHIFT-HUB aims to catalyze innovation and drive positive change in healthcare.

The SHIFT-HUB vision to tackle current smart health challenges
Paul Stefanut (BOOSTER)

SHIFT-HUB Games and Educational Resources

Nadja Dokter (Ippocrate AS), Elísio Costa (UPORTO)

SHIFT-HUB Community
Gabriele Casalini (EDSA)

1st Panhellenic Symposium on Simulation in Medical Education - I

Chair: E. Smyrnakis

Invited talk:
Enhancing Simulation Training with Mixed-Reality

Mr Carlos Chidiac MD

Chair: E. Smyrnakis

Simulation-based training in comprehensive physical examination skills using a high-fidelity patient simulator prior to real patient encounters: A novel initiative for undergraduate medical students in Greece

Evangelia Savvidou [1], Stefanos Koukouliatas [1], Georgios Zachariadakis [1], Athanasia Sandali [1], Maria Moirasgenti [1], Maria Deligianni [1], Eleni Dafli [1], Panagiotis Stachteas [1], Emannouil Smyrnakis [1]

[1] Clinical Skills and Simulation Center, Laboratory of Primary Health Care, General Practice and Health Services Research, School of Medicine, Aristotle University of Thessaloniki (AUTh), Thessaloniki, Greece

Introduction: Simulation-based medical education (SBME) techniques allow for in-depth learning and integration of theory into practice, enabling the practice of clinical skills in realistic yet 'safe'environments. However, SBME methods, especially technology-assisted ones, are rarely employed in medical courses in Greece. At the Medical School AUTh, SBME is limited to teaching basic clinical skills during pre-clinical years. This initiative offered medical students prior to their final year of studies (years 3-5) the opportunity to practice complete history-taking and physical examination in realistic scenarios using a high-fidelity patient simulator.

Methods: A three-step educational and assessment process was followed. Initially, the student played the scenario individually. The facilitators, including senior medical students, assessed the student's performance using a predefined scenario-specific checklist. Then, the student discussed with one facilitator and self-evaluated his/her performance during the debriefing phase. Lastly, the student filled out a scenario-assessment questionnaire. The data were analyzed thematically and comparatively.

Results: Eighteen students participated in the initiative's pilot phase. Students' performance assessments revealed good history- and vital signs-taking competency. However, most students demonstrated low competency in infection prevention, obtaining consent, and addressing patient's concerns. Students evaluated the scenario as realistic and adequate for their educational level and the debriefing as an important educational component. The identified scenario's shortcomings concerned the simulator's voice system.
Conclusion: The preliminary findings suggest that this SBME initiative is beneficial for enhancing students' clinical competency and identifying areas requiring further medical training, aiming for a smoother transition from the simulation environment to real clinical settings.

Enhancing Empathy in Healthcare through Virtual Reality Training: A Novel Approach to Medical Education

Sofia E Reppou[1], Anne Marie Reid[1], Trudie Roberts[1], Panagiotis D Bamidis[2]

[1] School of Medicine, University of Leeds, UK
[2] School of Medicine, Aristotle University of Thessaloniki, Greece

Background: Virtual Reality (VR) technology offers immersive simulations and holds promise across various industries, including healthcare. This study aims to use VR to teach medical students and healthcare professionals about empathy, a crucial component of patient-doctor interaction. Empathy plays a crucial role in patient-centered care, influencing diagnostic accuracy, patient satisfaction, and overall healthcare outcomes. Despite its significance, teaching empathy remains a challenge in medical education curricula and within clinical settings.
Methods: VR scenarios simulate clinical encounters between healthcare professionals and virtual patients with varied medical conditions. Users, as doctors, interact with virtual patients, responding empathically with multiple options. The application, built on Unity3D, includes five scenarios with rigged avatars and custom animations, navigated with Oculus Quest 2 controllers. Stakeholder collaboration and continuous refinement ensured scenario relevance.
Results: Before widespread implementation, the VR scenarios underwent preliminary testing involving developers, medical students, and healthcare professionals. This testing aimed to evaluate the effectiveness and feasibility of the VR-based empathy training approach. Positive outcomes emerged from this testing phase, suggesting that VR has significant potential for empathy training within healthcare settings. Participants responded favorably to the immersive nature of the scenarios, indicating that VR can effectively enhance empathy skills.
Conclusion: VR technology presents a novel approach to empathy training in healthcare, offering immersive and interactive simulations that enhance communication skills and empathic abilities and serve as an adjunct tool to teach empathy to medical students and healthcare professionals. Further evaluation and refinement of VR scenarios are needed to optimize their effectiveness and integration into medical education and training programs.

Master Class

Master Class on patient-centered communication skills with Standardised Patients

Facilitators: Jools E Symons, Anastassia Rodina-Theocharaki, Maria Nikolaidou, Cassie Reynold-Araji, Joannie Tate, Naseem Akram, Polina Semennikhina, Fatima Bagiyarova, Alma Baatjes, Gulnara Khudaykulova, Gefsi Mintziori

The FOR21 Master Class will present and pilot with the audience an OSCE station on communication skills training, as it was developed in the FOR21 funded project (Grant: 619037-EPP-1-2020-1-EL-EPPKA2-CBHE-JP) for the purpose of medical education and assessment. Participants will get the chance to simulate a doctor interacting with a Standardised Patient displaying their symptoms and emotional state or act as an OSCE examiner assessing communication skills.
The Patient | Carer Community (PCC) from the University of Leeds will be presented along with the benefits of having a patient interacting with students and professionals in a controlled environment. Time for discussion will be allocated.

2nd SHIFT-HUB Conference Smart Health Innovation& Future Technologies Conference - II

Chair: D. Petsani

Panel
Innovation and Research in Clinical Environments: Overcoming Challenges for the Future of Healthcare – powered by CareBridge

Panelists:
Stelios Hadjidimitriou, PhD, Senior Researcher at Signal Processing & Biomedical Technology Unit AUTH | Digital Biomarkers and AI-enabled HealthCare
Michael Doumas, Professor, Director of the 2nd Propaedeutic Internal Medicine Clinic of Ippokrateio General Hospital of Thessaloniki
Adriane Thrash, Managing Partner, Anthology Ventures
Apostolia Karabatea, R&D Project Manager, Gnomon Informatics SA

In the rapidly evolving healthcare landscape, the need for innovative and effective solutions is more pressing than ever. HealthTech has revolutionized the delivery and reception of care across the healthcare spectrum, becoming a crucial enabler for comprehensive care provision. Experimentation in clinical environments is essential for developing technologies and solutions that address the complex and multifaceted nature of healthcare. However, this experimentation presents several challenges for all stakeholders involved.
This panel session will explore the challenges faced by actors in the HealthTech innovation ecosystem when designing and implementing solutions in clinical environments. The session will address the barriers to the widespread adoption of these disruptive technologies in healthcare, including regulatory hurdles, interoperability issues, and resistance to change. The goal is to highlight strategies for overcoming these

obstacles and promoting continuous innovation in the healthcare sector, with a focus on in-patient clinical environments.

On innovation ecosystems and their value for today's European Research Area

Alice Seim [1], Karoline Haack [1], Adamantios Koumpis [2]
[1] Steinbeis Europa, Germany
[2] Biomedical Informatics Institute, University Hospital Cologne, Germany

There are many initiatives and projects that include the study of research or innovation ecosystems in their agendas and objectives. In some more ambitious and risk-taking cases, they also seize the opportunity to claim and build such ecosystems. In practice however, there is no such thing as an ecosystem as a discrete entity. It is rather a dynamic – and also very fragile – constellation, most often of a purely virtual nature.
There is always a risk that instead of seeing a single tree, one may encounter a dense 'forest' of innovations. Some of these innovations may have led to successful deployments and applications, while others appear to have reached a dead-end or still waiting to find a successful match with a need that has yet not been identified or discovered.
Current efforts in Europe to accelerate innovation and unlock excellence involve the establishment of regional innovation valleys (hubs?), especially involving regions with lower innovation performance. These efforts, along with a focus on s strategic areas of regional strength and specialization, can provide valuable insights into what truly works, as opposed to what may not work despite expectations.
Similar to the technology readiness levels where a formulated concept is assigned a TRL of 2, while'validation in the laboratory' is assigned a TRL of 4, there is also a need for innovation ecosystems to move to higher levels with validation and demonstration in a real environment (TRLs 5 and 6 respectively) and demonstration in an operational environment (7). Following our analogy with innovation ecosystems, the success of a concept can only be judged by its sustainability in the real world.
In our SHIFT-HUB project we aim to establish a pan-European innovation hub for smart health technologies to foster the uptake of technologies and solutions in this field. We acknowledge the significance of emphasizing local and regional aspects in fostering innovation. However, we recognize that it is not simply a matter of cross-fertilisation in the sense of combining ideas or different groups of people to produce a better result, but rather a matter of innovation cohesion in terms of cross-networking. This will support researchers and research groups as well as companies and especially start-ups in scaling up their ideas, as well as deploying and demonstrating deep technologies in real world environments and with end users, access to cross-border infrastructure and expertise, exchange of staff, training and skills development and developing standards and regulations through sandboxes and test beds, as expressed in the 'New European Innovation Agenda' issued by the European Commission.
Connecting innovators and ecosystems across Europe cannot be achieved within the timeframe of a two- or three-year project, nor can building a platform for researchers, policy makers, entrepreneurs and stakeholders. It is not solely about the challenges of of building it as such, but also about assessing its viability in terms of business sense and sustainability. Success may not be immediate, and it often requires perseverance until l positive signals start to emerge, ultimately leading to success.
In the SHIFT-HUB project we operate a range of instruments and tools to foster uptake of technologies and solutions like i. the Living Lab methodology and an online gamification based e-learning journey ensuring an immersive experience for patients and citizens; ii. an Open innovation approach to foster a collaborative ecosystem of multidisciplinary stakeholders; iii. a technical platform pilot including a Health Data Hub, a Smart Health Apps Repository and an online Marketplace.
We are also experimenting with new formats like Demo Days, which are designed to shine a light on ideas at any stage of their lifecycle – to use again the analogy of TRLs, we are committed to offer space and support to technologies and solutions that are in any stage of the TRL scale from 1, where some basic principles have been established that may lead to a possible new product, to TRL 9, where an actual system has been proven in an operational environment but still needs to find its place in the market.

Acknowledgment: Part of the activities related to this work have been financed under the Shift-HUB project, which has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101095720.

Benefits for target groups: Some lessons learned from the SHIFT-HUB Project

Sorina Loloiu(Mitroi) [1], Alice Seim and Karoline Haack [2], Adamantios Koumpis [3]

[1] BEIA Consult International, Romania
[2] Steinbeis Europa, Germany
[3] University Hospital Cologne, Germany

In recent years, the European Union (EU) has recognized the growing significance of addressing non-communicable diseases (NCDs) as a major public health challenge. Among the various NCDs, throughout the project lifetime we focus on five pathologies that we aim to support, namely (1) Chronic diseases (in general), (2) Cancer, (3) Disease Prevention, (4) Cardiovascular diseases, and (5) Mental disorders.

These health areas pose significant challenges that require comprehensive and nuanced responses, especially in the context of the diverse and dynamic EU member states.

The prevalence of these health conditions, along with the associated costs, has been steadily increasing in the EU. With aging populations, urbanization, and changing lifestyles, the region is confronted with higher incidences of NCDs, leading to a considerable societal and economic burden. It is against this backdrop that the EU, its member states, healthcare providers, and stakeholders have recognized the pressing need for a more proactive, targeted, and evidence-based approach to prevention and management.

To this dynamically forming landscape, SHIFT-HUB aims to establish a pan-European Smart Health Innovation Hub bringing together a rich network of multidisciplinary stakeholders across the dimensions of the quadruple helix, with the mission to facilitate the development, ensure the promotion and foster the uptake of Smart Health technologies and services.

By putting a strong community of emerging digital technology providers, at the service of patients, citizens, practitioners and healthcare institutions, SHIFT-HUB aims to foster the uptake of Smart Health Technologies and services. Through awareness raising, digital literacy and behavior modification experiences, it aims to facilitate the paradigm shift from reactive to proactive and personalized healthcare, focused on maintaining good health rather than managing disease.

In order to foster technology development and experimentation, SHIFT-HUB is designing and implementing a patient-centric and community-driven pilot offering secure access to anonymized data for applications development and paving the way towards the future federated European Health Data Space. SHIFT-HUB aims to act as a gateway facilitating access for practitioners, patients and citizens to European Smart Health technologies through its infrastructure and by leveraging the dense network of EU Digital Innovation Hubs that will be targeted as partners to foster an intersectoral cross-fertilization. By the same token, the SHIFT-HUB ecosystem will foster cultural change between stakeholders from various backgrounds, inducing a process of peer-learning, skills enrichment and transfer of know-how globally enriching the community.

As identified in [1], 'orchestrating scientific work in educational research laboratories is demanding, especially when many interdisciplinary perspectives are involved'. This applies to the case of innovation ecosystems in medicine at large as well as in any specific case of tackling a disease or a pathology. With the increasing adoption of artificial intelligence (AI) in healthcare and the emergence of digital health startups introducing novel technologies and services to the market, there's a notable potential for cost savings and service enhancements in healthcare [2]. The implications of these developments on both demand and supply sides, and their consequent impact on ecosystems, have been examined in [3] through a practical example.

The existing literature barely explains the complexity of health ecosystems innovation, regarding the range of stakeholders and their role within the ecosystem. In our report we tried to address this deficiency by means of identifying the relevant stakeholders and demonstrating the complexity of involving the target

groups in the design phase as part of the innovation ecosystems, which consist of multiple levels, each level comprising different stakeholders. In the SHIFT-HUB project we elaborate the role of each target group and the individual stakeholders in the engagement within the ecosystem and follow the dynamics of e.g. particular clinical study groups, as part of research through the analysis of its catalysts. The outcomes reinforce the point of innovation ecosystems continuously advancing, rather than functioning at a certain level of development.

Acknowledgment: Part of the activities related to this work have been financed under the Shift-HUB project, which has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101095720.

References

[1] Ehlenz, et al. (2022). Open Research Tools for the Learning Technologies Innovation Lab. International Journal of Online and Biomedical Engineering, 18(14), pp. 42–58.

[2] Albert Feisal Muhd Feisal Ismail, et al. (2022). Artificial Intelligence in Healthcare Business Ecosystem: A Bibliometric Study. International Journal of Online and Biomedical Engineering, 18(09), pp. 100–114.

[3] Hofstetter, M., t al. (2020). Avoiding a Data Science Winter by Keeping the Expectations Low. International Journal of Advanced Corporate Learning, 13(4), pp. 4–12.

2nd SHIFT-HUB Conference Smart Health Innovation& Future Technologies Conference - III

Chair: A. Seim, A. Papachristodoulou

SHIFT-HUB Entepreneurial Discovery Workshop: Exploring Central Macedonia's Opportunities for Smart Health

Panelists: Eri Toka, Costas Tramantzas, Dimitris Kourtesis, Nikos Tsoniotis, Pantelis Natsiavas, Nikos Athanasopoulos

SHIFT-HUB Opportunities: Yiannis Geragotellis (KiNNO)

The EU-funded SHIFT-HUB project holds a workshop entitled "Exploring Central Macedonia's Opportunities for Smart Health" at the 5th International Conference on Medical Education Informatics on 11 June, followed by a networking session.

The aim of this workshop is to connect smart health stakeholders in the Central Macedonia region. By fostering these connections, the aim is to help stakeholders identify new funding opportunities and ways to better support the regional ecosystem. Participants will have the opportunity to participate in a panel discussion that will focus on exploring existing regional initiatives, services provided by innovation hubs, awareness and participation in support activities, experiences with public funding, and the specific needs and challenges faced by healthcare professionals and patients. In addition to local insights, the workshop will also present experiences from other regions, providing a comparative perspective and addressing the unique regional challenges faced by Central Macedonia.

Following the panel discussion, participants are invited to attend a networking session. This session provides a valuable opportunity to network with peers, exchange ideas and establish potential collaborations.Join us to explore the opportunities and future directions for smart health in Central Macedonia.

1st Panhellenic Symposium on Simulation in Medical Education - II

Chair: E. Dafli

Invited talk:
AV Technologies for Health Sciences and Healthcare Spaces
Οπτικοακουστικές τεχνολογίες για Επιστήμες Υγείας κ χώρους φροντίδας υγείας

Alexandros Psitos, TELMACO

Chair: E. Dafli

Panel
Experiences from Simulation in medical education in Greece (In Greek)
Εμπειρίες από την προσομοίωση στην ελληνική ιατρική εκπαίδευση

This is a first of its kind panel for the Hellenic territory. Representatives from Greek and Cypriot Universities, as well as, healthcare training organisations, will share their experiences of conducting simulation to enhance the educational practice. Different pedagogies, simulation software and manikin-based training will be discussed in order to enhance medical education. Panellists will draw on best practices at local, national and internation levels.

1. Clinical Skills Lab and Patient Simulation at Aristotle University of Thessaloniki, School of Medicine
E. Smyrnakis
Κλινικές Δεξιότητες και Προσομοίωση Ασθενών στην Ιατρική ΑΠΘ
Ε. Σμυρνάκης, Αναπλ. Καθηγητής, Τμ Ιατρικής ΑΠΘ

2. Simulations and Clinical skills at Cyprus University Medical School
E. Gkougkoudi
Προσομοίωση και κλινικές δεξιότητες στην Ιατρική του Πανεπιστημίου Κύπρου
Δρ. Ε. Γκουγκούδη, Υπεύθυνη Εργ Κλινικών Δεξιοτήτων, Ιατρική Σχολή, Παν, Κύπρου

3. Initial attempts for a simulation programme at the University of Thessaly Medical School
I.C. Tsougos
Αρχικές προσπάθειες για την οργάνωση προγράμματος προσομοίωσης στην Ιατρική του Παν. Θεσσαλίας
Ιωάννης-Χρυσοβαλάντης Τσούγκος, Καθηγητής, Τμ Ιατρικής, Παν. Θεσσαλίας

4. Opening of the Medical Simulation Centre at "Evangelismos Hospital", Athens
I. Vasileiadis
Έναρξη Λειτουργίας του Κέντρου Ιατρικής Προσομοίωσης στον "Ευαγγελισμό"
Ιωάννης Βασιλειάδης, Αναπληρωτής Καθηγητής Παθολογίας-Εντατικής Θεραπείας,

5. From symptom to diagnosis: The perspective of Clinical Simulation
P. Angelogianni
Από το σύμπτωμα στην διάγνωση: Η προοπτική της Κλινικής Προσομοίωσης
Παναγούλα Αγγελογιάννη, Αναπλ. Καθηγήτρια, Ιατρική Σχολή, ΕΚΠΑ

6. Use of high-fidelity simulators in healthcare training. Experiences from the Greek National Emergency Aid Centre
V. Dimitropoulou-Deimente
Χρήση των προσομοιωτών υψηλής πιστότητας στην εκπαίδευση των υγειονομικών. Η εμπειρία του ΕΚΑΒ
Βασιλική Δημητροπούλου Ντεϊμεντέ, Αναισθησιολόγος Επειγοντολόγος Επιμ.Α', Αν. διευθύντρια ΣΑΕΚ ΕΚΑΒ, Υπεύθυνη Εκπαιδευτικών προγραμμάτων ΕΚΑΒ

7. The educational experience of the Nursing Simulation Laboratory of the Nursing Department of the University of Patras
N. Stefanopoulos
Η εκπαιδευτική εμπειρία του Εργαστηρίου Νοσηλευτικής Προσομοίωσης του Τμήματος Νοσηλευτικής του Πανεπιστήμιου Πατρών
Νικόλαος Στεφανόπουλος, Αν. Καθηγητής, Τμήμα Νοσηλευτικής, Πανεπιστήμιο Πατρών

Training aspects in Digital Health

Chairs: A. Athanasiou, A. Astaras

Sensor data fusion based on Electrical Impedance Spectroscopy for Dermatological Diagnosis: the DermaSense prototype scanner

Ina Ramo [1], Thomai Chatzidaniil [1], Anastasios Nikiforidis [1], Christina Kemeanetzi [2], Eirini Kyrmanidou [2], Elisabeth Lazaridou [2], Alexandros Moraitopoulos [3], Panagiotis Bamidis [3], Alexandros Astaras [1]

[1] Computer Science, American College of Thessaloniki, Thessaloniki, Greece
[2] 2nd Dept. of Dermatology-Venereology, Papageorgiou General Hospital AUTH, Greece
[3] Lab of Medical Physics & Digital Innovation, Thessaloniki, Greece

Introduction: Dermatological diagnosis can benefit from additional objective quantitative data acquisition sources. Several researchers have proposed a variety of such modalities for better detecting and understanding diseases such as skin lesions, actinic keratosis and melanoma. We developed a prototype instrument for medical decision support to assist with dermatological diagnosis, based on the idea of profiling skin tissue according to its electrical resistance.
Methods: Using the electrical impedance spectroscopy technique, data is acquired from the skin utilising a

custom-designed scanner which works by injecting low power current signals across various frequencies and through multiple electrodes surrounding the skin lesion. This method is based on the fact that cancerous cells generally form an altered tissue structure, leading to atypical measurements. We are currently in the process of data gathering and developing a machine learning algorithm which scans for patterns, then classifies the readings according to a probability factor for a particular disease.
Results: We have conducted initial laboratory and clinical study on a small number of healthy subjects and some patients with skin lesions. The DermaSense prototype device demonstrated consistency and repeatability in distinguishing among various categories of skin conditions, including healthy nevi, actinic keratosis and patches of healthy skin.
Conclusion: The development of the DermaSense medical decision support system is an ongoing project. Future plans include improving data acquisition efficiency and more accurate artificial intelligence algorithms, while maintaining our commitment to inexpensive, compact and portable hardware, utilising sensor data fusion to supplement the current state-of-the-art in dermatological diagnosis.

EDSS Identification in Multiple Sclerosis Patients Using Fitbit Wearable Data: Leveraging Regression and Classification of Real-World Data for Informed Clinical Decision-Making.

Theologos Kyrou [1], Alexandros Moraitopoulos [2], Alexandra Anagnostopoulou [2], Georgios Petridis [2], Antonios Billis [2], Ioannis Nikolaidis [3], Nikolaos Grigoriadis [4], Panagiotis D. Bamidis [2], Charis Styliadis [2]

[1] Department of Electrical Engineering, Aristotle University of Thessaloniki, Thessaloniki, Greece
[2] Medical Physics and Digital Innovation Laboratory, Aristotle University of Thessaloniki, Thessaloniki, Greece
[3] Neurology Department, Hippokration General Hospital Thessaloniki, Thessaloniki, Greece
[4] Multiple Sclerosis Center, 2nd Department of Neurology, Aristotle University of Thessaloniki, Thessaloniki, Greece

Background: Monitoring the health status of people with multiple sclerosis (PwMS) in unconstrained environments is essential for improving patient care. Nevertheless, healthcare professionals are often hesitant to use patient-generated data in their decision-making and clinical practice. This study introduces a novel approach by utilizing regression and classification techniques on real-world data from commercial wearables to identify the health status of PwMS.
Methods: Data was collected from the Fitbit commercial wearables worn by 38 PwMS (9 males; age 41±11 years old; EDSS: 3.09±1.6) over 14 days. Temporal trends in activity bouts were analyzed, utilizing Metabolic equivalents (METs) computed from Fitbit's biometrics. These features, along with other biometrics such as heart rate, step count, and sleep score, were employed in regression and classification models to estimate the Expanded Disability Status Scale (EDSS), a key metric for assessing MS-related physical disability.
Results: The best-performing regression model was identified as the Random Forest Regressor, with mean squared error (MSE) of 1.03 and mean absolute error (MAE) of 0.72, with a statistically significant p-value of 0.05. The top-performing classification model was the Random Forest Classifier, achieving an F1 score of 0.9 and an accuracy of 0.88 in delineating PwMS into distinct health states. Employing regression and classification techniques on Fitbit data has shown the potential for identifying MS-related physical disability.
Conclusion: These promising findings highlight the pressing necessity to enhance the digital and data literacy of healthcare professionals to leverage the clinical uptake of real-world data.

A Normative SEMG Database for Upper Limb Biometric Comparisons in Rehabilitation Research

Athanasios Arvanitidis [1], Konstantinos Mitsopoulos [1], Vasiliki Fiska [1], Vasiliki Mantiou [1], Theodore Savvidis [1], Diamanto Mylopoulou [1], Kalliopi Mpeiza [1], Panagiotis D. Bamidis [1] and Alkinoos Athanasiou [1]

[1] Laboratory of Medical Physics & Digital Innovation, School of Medicine, Faculty of Health Sciences, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece

Background: Normative reference databases are essential for clinical evaluation and rehabilitation across various modalities [1], [2]. However, a significant gap exists in quantitative EMG (QEMG) databases for upper limb muscles (bicep and tricep), hindering advancements in diagnosing and treating neuromuscular disorders. This study addresses this gap by creating a dynamic and scalable NoSQL database (sEMG-NormDB) for normative sEMG data.
Methods: sEMG-NormDB comprises data for 10 healthy adults (5 male-mean values: age 25.4y, weight 84.25kg, height 180.25cm, BMI 26.05, 5 female-mean values: age 23.8y, weight 54.4kg, height 163.2cm, BMI 20.42) meeting specific inclusion criteria [2]. Following established SENIAM guidelines for sensor placement and signal processing, sEMG signals were acquired [3]. Recordings captured muscle function data, including rest with eyes open and closed, bicep curls and tricep extensions with and without resistance, and MVC for both muscles. The database incorporates labeled data: raw sEMG data, filtered data, extracted EMG features (e.g., RMS, MAV, MDF) with established upper and lower limits defining the normative range, and anthropometric data.
Results: Z-scores calculated using data from the continuously updated sEMG-NormDB will be compared with patient data in a later stage of the study, demonstrating the database's capability to differentiate between normal and abnormal muscle activity. Any patient data falling outside the established limits will suggest potential neuromuscular dysfunction.
Conclusion: sEMG-NormDB offers a valuable resource for researchers with standardized QEMG data for upper body muscles. Its dynamic and scalable design allows for continuous updates, ensuring its ongoing relevance for rehabilitation research and clinical practice.
Acknowledgements: This abstract is presented in the context the HEROES project which was funded by the Hellenic Foundation for Research and Innovation (H.F.R.I.) under the “2nd Call for H.F.R.I.’s Research Projects to Support Faculty Members & Researchers” (Project Number: 4391).

References

[1] C. J. De Luca, ‘The Use of Surface Electromyography in Biomechanics’, Journal of Applied Biomechanics, vol. 13, no. 2, pp. 135–163, May 1997, doi: 10.1123/jab.13.2.135.
[2] K. Nizamis, A. Athanasiou, S. Almpani, C. Dimitrousis, and A. Astaras, ‘Converging Robotic Technologies in Targeted Neural Rehabilitation: A Review of Emerging Solutions and Challenges’, Sensors, vol. 21, no. 6, p. 2084, Mar. 2021, doi: 10.3390/s21062084.
[3] H. J. Hermens and Roessingh Research and Development BV, Eds., European recommendations for surface ElectroMyoGraphy: results of the SENIAM project. in SENIAM, no. 8. Enschede, 1999.

A prototype automated version of the Action Research Arm Test (ARAT) for assessing upper extremity performance using the YOLO computer vision algorithm for real-time object detection

Ariton Veselinoski [1], Konstantinos Kasimis [2], Alkinoos Athanasiou [3], Alexandros Astaras [1]

[1] Computer Science, American College of Thessaloniki, Thessaloniki, Greece
[2] Department of Physiotherapy, International Hellenic University, Thessaloniki, Greece

[3] Medical Physics & Digital Innovation Laboratory, School of Medicine, Aristotle University of Thessaloniki, Greece

Introduction: The Action Research Arm Test (ARAT) is a widely used clinical assessment of upper limb motor function and dexterity for patients with muscular or neurological impairments. There is a need to enable such patients to perform the assessment more frequently in domestic surroundings, without professional assistance. This project presents an automated prototype system which we developed implementing the ARAT, utilising advanced computer vision technology to offer a solution.
Methods & Results: The system uses an external camera to feed real-time video to a computer vision model based on the state-of-the-art YOLOv8 algorithm. The machine learning AI model was trained for optimal real-time object detection and tracking, logging the compliance and time associated to complete each task. An audiovisual user interface guides the user through the assessment process providing real-time feedback. Validation experiments were conducted to evaluate the system's performance, usability and consistency against clinicians' ratings. Initial results indicate the system performs within a reasonable margin of error in tracking the time needed to perform tasks, only lacking the ability to assess the positioning of the patient's hands. Further development is needed to improve on some of the subjective scoring aspects.
Conclusion: Integrating state-of-the-art computer vision models and techniques, this system improves on the traditional ARAT offering less dependency on dedicated professional assistance, guaranteed objectivity and improved accessibility for patients. The system may be used to train health care professionals in performing the ARAT, as well as to empower patients in assessing their own physical rehabilitation progress.

Assessing perception of wearable robotics in rehabilitation by the biomedical technology audience: insights from a ThessRoboGlove (TRG) Forum workshop

Spyros Nikolopoulos [1], Markos Tsipouras [2], Panos Polygerinos [3], Kostas Nizamis [4], Vasiliki Fiska [1,2,5], Konstantinos Mitsopoulos [5], Paschalina-Danai Sarra [5], Alkinoos Athanasiou [5], Panagiotis D. Bamidis [5], Alexander Astaras [5,6]

[1] Multimedia Knowledge and Social Media Analytics Laboratory, Information Technologies Institute, Centre for Research & Technology Hellas, 57001 Thermi, Thessaloniki, Greece
[2] Department of Electrical and Computer Engineering, University of Western Macedonia, 50100, Kozani, Greece
[3] Department of Mechanical Engineering, Hellenic Mediterranean University, 71004 Heraklion Crete, Greece
[4] Department of Design, Production and Management, University of Twente, 7522 NB Enschede, The Netherlands
[5] Laboratory of Medical Physics & Digital Innovation, School of Medicine, Faculty of Health Sciences, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece
[6] Department of Computer Science, American College of Thessaloniki, 55535 Thessaloniki, Greece

Background: The need for accurate reproduction of human motor output in assistive medicine and rehabilitation, made possible by the rapid expansion of wearable robotics and facilitated by the popularization of rapid prototyping, leads to the creation of novel wearable robotics with sensing and actuation capabilities [1]. Research teams often work in parallel, running into challenges that would benefit from cooperation and knowledge exchange [2]. To facilitate this, we attempt to assess the perception of these technologies by the biomedical technology community.
Methods: The ThessRoboGlove Forum organized an interactive workshop during a Hellenic Society of Biomedical Technology event. Six wearable robotics devices were briefly presented by their developer, emphasizing neurorehabilitation use cases and operation. The audience then engaged in conversation with the presenters, based on Godspeed robotics [3] and structured evaluation questionnaires.

Results: Twenty-one workshop participants (13m, 8f), aged 30-56 (avg=42.4) completed the anonymized questionnaires, the majority (15) stemming from engineering fields, involved in biomedical technology development (avg=3.32/5) and familiar with co-creation methodologies (avg=3.11/5). The participants found the presented devices somewhat unobtrusive & mature (avg=3.08/5 & avg=3/5), targeting complex use cases (avg=4.18/5) and that would benefit from co-creation (avg=4.35/5). Device anthropomorphism and animosity were rated low (avg=2.65/5 & 2.87/5), with medium likeability and perceived intelligence (avg=3.61/5 & 3.1/5) and high perceived safety (avg=3.93/5).
Conclusions: Common identified themes included device size, weight, autonomy, practicality and obtrusiveness issues, improved designs and sensor arrays and overall need for continuous development. A larger-scale online workshop will attempt to gather more data and wider insights.
Acknowledgements: This abstract is presented in the context the HEROES project which was funded by the Hellenic Foundation for Research and Innovation (H.F.R.I.) under the "2nd Call for H.F.R.I.'s Research Projects to Support Faculty Members & Researchers" (Project Number: 4391).

References
[1] Nizamis K, Athanasiou A, Almpani S, Dimitrousis C, Astaras A. Converging Robotic Technologies in Targeted Neural Rehabilitation: A Review of Emerging Solutions and Challenges. Sensors 2021; 21(6):2084
[2] Babič J, Laffranchi M, Tessari F, Verstraten T, Novak D, Šarabon N, Ugurlu B, Peternel L, Torricelli D, Veneman JF. Challenges and solutions for application and wider adoption of wearable robots. Wearable Technol. 2021; 2:e14
[3] Bartneck C. Godspeed Questionnaire Series: Translations and Usage. In: Krägeloh CU, Medvedev ON, Alyami M (Eds.) International Handbook of Behavioral Health Assessment. Berlin: Springer, 2023, doi: 10.1007/978-3-030-89738-3_24-1

MEDSIM Contest

Invited talk:
How to design an advanced medical simulation scenario

Dr. Daniel Rey Aldana

Chair: E. Gkougkoudi

MEDSIM Contest: a competition for Undergraduate healthcare students in clinical simulation scenarios

MedSimContest is a competition for ***undergraduate healthcare students in clinical simulation scenarios*** that will be conducted during the MEI 2024 Conference.
It will be ***an educational experience in a format of a contest*** for students that will have to compete in teams against each other taking part in simulation scenarios. Students will have clinical access to an adult manikin

to compete in various aspects of patient care. Clinical Simulation experts will observe and supervise the competition that will be observed by the audience to create an educational experience for all the participants.
The MedSimContest will offer learning opportunities for those participating and those watching, as every person involved can benefit from observing and reflecting on decision making.

Digitalised Healthcare Education II

Chair: Hooi Min LimMEDSIM Contest

"To err is human". Simulation training improves clinical practice and patient safety

Vagia Evgeniou[1], Ioannis Korakianitis[1], Eirini Schiza[2], Nikolaos Kadoglou[1], Evangelia Gkougkoudi[1]

[1] Medical School, University of Cyprus, Nicosia, Cyprus
[2] CYENS, Nicosia, Cyprus

Background: Simulation training in medical education has been used for more than a decade, prioritizes patient safety. Fourth year medical students in the Medical School of University of Cyprus underwent simulation training in Cardiology using High Fidelity (HF) mannequins as patient simulators.
Method: Seventy-five (75) 4th year medical students, underwent simulation training sessions, during cardiology training and expressed their expectations just before and their feedback immediately after completing the 3 weeks training course, using a questionnaire. The course contains emergency cardiology scenarios like infractions, pulmonary oedema, or severe arrhythmias like ventricular fibrillation. The students were aware of the theoretical background as they had attended theoretical lectures. The session was recorded, and a debriefing session came next to the scenario an hour latter.
Results: The resulting replies were analysed using the two-sample Mann–Whitney U test, where the outcome was significant for all replies. On the first day of the 1st simulation session, students expressed high levels of anxiety and insecurity about the procedure, while at the end, they asked for more simulation sessions and expressed improvement in multidisciplinary team cooperation and in "soft" skills. Students also found the debriefing session which followed the simulation sessions extremely useful. The session was structured according to the 3-phased Diamond Debriefing model.
Conclusions: Increased competence is the fundamental principle in efficient and safe patient treatment. Effective teamwork is another prerequisite for ensuring patient safety and treatment. Both conditions are improved using simulation medical training.

Navigating the Future of Healthcare: The Role of the ManagiDiTH Master Program in Shaping Digital Innovators

Konstantinos G. Diamantis [1], Maria Nikolaidou [1], Savvas Anastasiadis [1], Vasiliki Pavlidou [1], Vasiliki Kalfa [1], Panagiotis D. Bamidis [1]

[1] Laboratory of Medical Physics and Digital Innovation, School of Medicine, Faculty of Health Sciences, Aristotle University of Thessaloniki (AUTH), 541 24 Thessaloniki, Greece

Introduction: The ManagiDiTH Master's Program emerges as a cutting-edge educational venture crafted through an international collaboration involving Greece, Portugal, and Finland. The program fills a critical gap identified through extensive research and is designed to train leaders in managing digital transformation in healthcare.
Methods: The ManagiDiTH program was designed after a thorough survey of existing postgraduate programs in digital transformation in healthcare. The survey analysed the academic offerings provided by the School of Medicine at the Aristotle University of Thessaloniki, as well as other programs nationally, in Greece, and internationally. The primary objective was to identify programs with a similar scope and focus to ManagiDiTH. The methodology used comparative analysis of curriculum elements, teaching methods, and program outcomes to achieve this goal.
Results: The research underpinning the ManagiDiTH program's inception highlighted its uniqueness, identifying no comparable postgraduate offerings globally that could integrate digital health management with such an extensive, application-oriented educational approach. This uniqueness is a crucial driver for the program's ability to equip students with strategic planning skills, implement digital health solutions, and lead interdisciplinary teams effectively.
Conclusion: The ManagiDiTH master's program integrates technology to address the educational gap in healthcare management and its digital transformation. The study has emphasised the need to introduce a postgraduate program like ManagiDiTH. This program can be an example of upcoming educational programs that effectively merge digital technology and health management.

Navigating the Digital Transformation in Higher Education: Assessing Undergraduate Students' Digital Skills at Aristotle University of Thessaloniki

Ioanna Dratsiou [1], Konstantinos Diamantis [1], Panagiotis Bamidis [1], Konstantinos Bikos [2]

[1] Laboratory of Medical Physics and Digital Innovation, School of Medicine, Faculty of Health Sciences, Aristotle University of Thessaloniki, Greece
[2] School of Philosophy and Education, Aristotle University Thessaloniki, Greece

Background: Universities bear the primary responsibility of shaping experts for the future digital landscape and preparing them for work in digitally evolved societies [1]. This entails adapting to the digital age by improving their ability to exploit digital technologies in the whole range of their activities and supporting students to cultivate their digital competence [2]. This paper endeavors to investigate the level of digital skills of undergraduate students from the Aristotle University of Thessaloniki (AUTh).
Methods: The methodological framework adopts a dual approach, employing a questionnaire grounded in the Digital Competence Framework for Citizens (DigComp) [3] alongside a laboratory test comprising 25 tasks representative of DigComp. The questionnaire, assessing digital skills through four distinct constructs (E-learning, Use of digital technologies by students, Use of digital technologies and learning strategies by educational staff, Cultivation of students' digital skills), is utilized in conjunction with Partial Least Squares Path Modeling (PLS-PM) to explore the interplay between these constructs and DigComp domains. Subsequently, the study investigates discernible disparities between self-assessed digital proficiencies and demonstrated competencies measured by the laboratory test.
Results: Results are expected to reveal which constructs influence DigComp areas most, as well any intermediary effects of demographic factors and the COVID-19 pandemic. Notably, we anticipate students will rate their digital skills higher than their performance in the lab test—a trend influenced by subjective factors in contrary to the more objective evaluation the test provided.

Conclusion: Further interpretation of the results may inform innovative policies to advance digital transformation in education and enhance students' digital skills.

References

[1] European Commission. (2021). 2030 Digital Compass: the European way for the Digital Decade. COM(2021) 118 final, Brusseels
[2] HEInnovate (2022). The european Commission's DG education and culture in partnership with the OECD. Available online at: https://www.heinnovate.eu/en (accessedApril 20, 2024).
[3] Ferrari, A., Punie, Y., Brečko, B.N., Institute for Prospective Technological Studies, 2013. DIGCOMP: a framework for developing and understanding digital competence in Europe. Publications Office, Luxembourg.

Are Immersive 360-Degree Interactive Video suitable for Educating Midwifery Students About Breastfeeding?

Maram A. Alammary [1,2], Lesley Halliday [1] and Stathis Th. Konstantinidis [1]

[1] University of Nottingham, Nottingham NG7 2HA, UK
[2] Princess Nourah bint Abdulrahman University, Riyadh 13412, Saudi Arabia

Introduction: Research into 360-degree interactive virtual reality (VR) videos in nursing and midwifery education is still in its early stages. Therefore, the aim is to explore the feasibility and acceptability of a 360-degree interactive VR video simulation to enhance midwifery students' knowledge and attitude towards breastfeeding support provided to mothers.
Method: A mixed-methods pretest-posttest design was employed to evaluate the effectiveness of a single session featuring two breastfeeding support scenarios delivered through mobile head-mounted displays (HMDs). Participants from a Saudi Arabian institute provided data on perceptions of acceptability, presence, knowledge, and attitude using validated instruments. Additionally, the technology acceptance model was utilized to assess the resource.
Results: The study yielded a response rate of 88.6% (n = 62). Participants showed high acceptance scores for perceived usefulness (4.6), perceived ease of use (4.6), attitude towards 360-degree VR video use (4.7), and intention to use (4.6). Assessment with the Slater-Usoh-Steed Presence Questionnaire revealed a strong sense of presence (mean= 5.8, SD = 1.2) out of a possible 7. Notably, participants' scores increased in both knowledge (mean change > 2 points) and attitude scores (mean change = 0.56 points). Statistical analyses indicated significant differences in average knowledge ($t = 6.86$, $p < .001$) and attitude ($t = 3.71$, $p < .001$) before and after the intervention.
Conclusion: 360-degree interactive VR video allows simulations to be expanded for larger groups and enhances learner participation and presence. The higher score indicates that the 360-degree VR video learning experience is considered participation and suitable.

Using the RE-AIM implementation science framework to evaluate eLearning object implementation in Malaysian universities

Hooi Min Lim [1], Chin Hai Teo [1,2], Yew Kong Lee [1], Ping Yein Lee [2], Sazlina Shariff Ghazali [3], Nurul Amelina Nasharuddin [4], Phelim Voon Chen Yong [5], Wei Hsum Yap [5], Stathis Konstantinidis [6], Heather Wharrad [6], Chirk Jenn Ng [1,7,8]

[1] Department of Primary Care Medicine, Faculty of Medicine, Universiti Malaya, Kuala Lumpur, Malaysia
[2] UM eHealth Unit, Faculty of Medicine, Universiti Malaya, Kuala Lumpur, Malaysia.
[3] Department of Family Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Malaysia.
[4] Department of Multimedia, Faculty of Computer Science and Information Technology, Universiti Putra Malaysia, Serdang, Malaysia
[5] School of Biosciences, Faculty of Health & Medical Sciences, Taylor's University, Subang Jaya, Selangor, Malaysia.
[6] School of Health Sciences, University of Nottingham, Nottingham, England.
[7] Department of Research, SingHealth Polyclinics, Singapore
[8] Duke-NUS Medical School, Singapore

Background: Most eLearning evaluations focus on learner outcomes (e.g. knowledge gain, satisfaction) but rarely assess its sustainable adoption and implementation outcomes. In this study, we used the RE-AIM (Reach, Effectiveness, Adoption, Implementation and Maintenance) implementation science framework to systematically evaluate the implementation outcomes of reusable learning objects (RLOs) in healthcare education.
Methods: Three Malaysian universities developed and implemented 23 RLOs for undergraduate medical, pharmacy and biomedical curricula as part of a capacity-building eLearning project. Various strategies were developed and used to disseminate and implement the RLOs. Data was collected using a self-administered online questionnaire and Google Analytics. Our study recorded cumulative access of 7622 users from 48 countries from May 2020 until February 2022 (Reach).
Results: Most users rated the RLOs as very helpful (70.1%) and helpful (29%). Pre- and post-assessments showed a significant improvement in the knowledge score (21 RLOs, $p<0.05$) and confidence level (17 RLOs, $p<0.05$) (Effectiveness). All universities adopted RLOs in their teaching and learning in the fields of personal and professional development, primary care medicine, medicine, paediatrics, nursing, pharmacy and biomedical science (Adoption). The proportions of users who completed the RLOs ranged from 5.6-84.4% with non-bounced (visited the website and navigated to different pages) users ranging from 16.3-81.5% (Implementation). After the project ended and the implementation strategies ceased, a total of 2107 users accessed the RLOs over four months (Maintenance).
Conclusion: RE-AIM is applicable in the systematic evaluation of eLearning resource implementation and the evidence can be used to inform the translation of eLearning innovations into routine teaching and learning.

Resilience Training for Medical Students in Spatial Computing Environments: Towards a Scoping Review

Anja Y. Bischof [1], Helen Galliker [1], Simone Kraehenmann [1,2], Janna Hastings [1,3], Tobias Kowatsch [1,3,4]

[1] School of Medicine, University of St.Gallen, St.Gallen, Switzerland
[2] Cantonal Hospital St.Gallen, St.Gallen, Switzerland
[3] Institute for Implementation Science in Health Care, University of Zurich, Zurich, Switzerland
[4] Department of Management, Technology, and Economics, ETH Zurich, Zurich, Switzerland

Background: The COVID-19 pandemic highlighted the issue of stress and burnout among medical doctors, potentially worsening the shortage of quality care. Resilience training, teaching mental health maintenance despite stressors, could mitigate stress-related disorders. Combining generative artificial intelligence with affordable spatial computing hardware offers dynamic, scalable training to bolster resilience. This study evaluates resilience training in spatial computing environments for integration into medical education.

Method: A scoping review is being conducted to assess the state-of-the-art research on resilience training and spatial computing environments. Databases including PubMed, MEDLINE, EMBASE, and Scopus are included. Screening and data extraction involve two coders, with thematic analysis used for summarization.
Preliminary results: A preliminary search in PubMed resulted in 1.500 articles, of which the first 500 have been screened. Subsequently, the remaining databases and results will be screened. Overall, 14 relevant studies were included in a preliminary thematic analysis. Results indicate that spatial computing environments might have beneficial potential for medical education. However, none of the identified studies focused explicitly on resilience training.
Conclusion: AI-generated high-immersive spatial computing environments might have the potential to strengthen the resilience of medical students and doctors alike. The current findings indicate a lack of research and will inform a final version of a scoping review protocol. We suggest that exploring this area further by systematically developing and evaluating corresponding resilience training environments will support the future delivery of high-quality care by highly resilient medical practitioners.