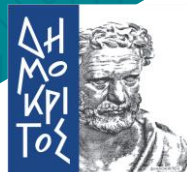


Dr. Athanasios Drigas
RESEARCH DIRECTOR
Engineer & Psychologist
Net Media Lab - Mind & Brain R&D
I.I.T. -N C S R "Demokritos"

«Industry 4.0, STEM, Δεξιότητες 21ου Αιώνα και Προκλήσεις στην Γενική και Ειδική Αγωγή»



DEMOKRITOS

1

Net Media Lab – Mind Brain R&D

Ταυτότητα

**National Center for Scientific Research "Demokritos"
Agia Paraskevis, Athens, Greece**

1961

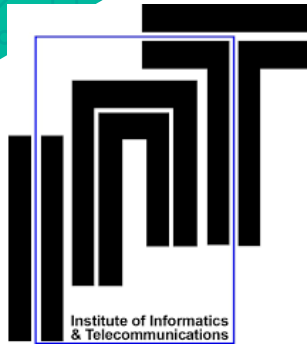


Today

**Greece's largest multidisciplinary Research Center
with approximately 1200 employees**

**60 YEARS DEVOTED TO RESEARCH
EDUCATION AND INNOVATION**

<http://www.demokritos.gr/>



Institute of Informatics & Telecommunications



Institute of Informatics & Telecommunications

- Wireless Networks
- Information Systems
- Web Apps
- Internet of Things
- Cloud Computing



+302106503230 - 3129 - Fax: +302106532175



imm-staff@iit.demokritos.gr



Net Media Lab

Mind & Brain R&D

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[THE LAB](#) ▾

[R&D](#) ▾

[EDUCATION](#) ▾

[DISTINCTIONS](#)

[THE TEAM](#)

[NEWS](#)

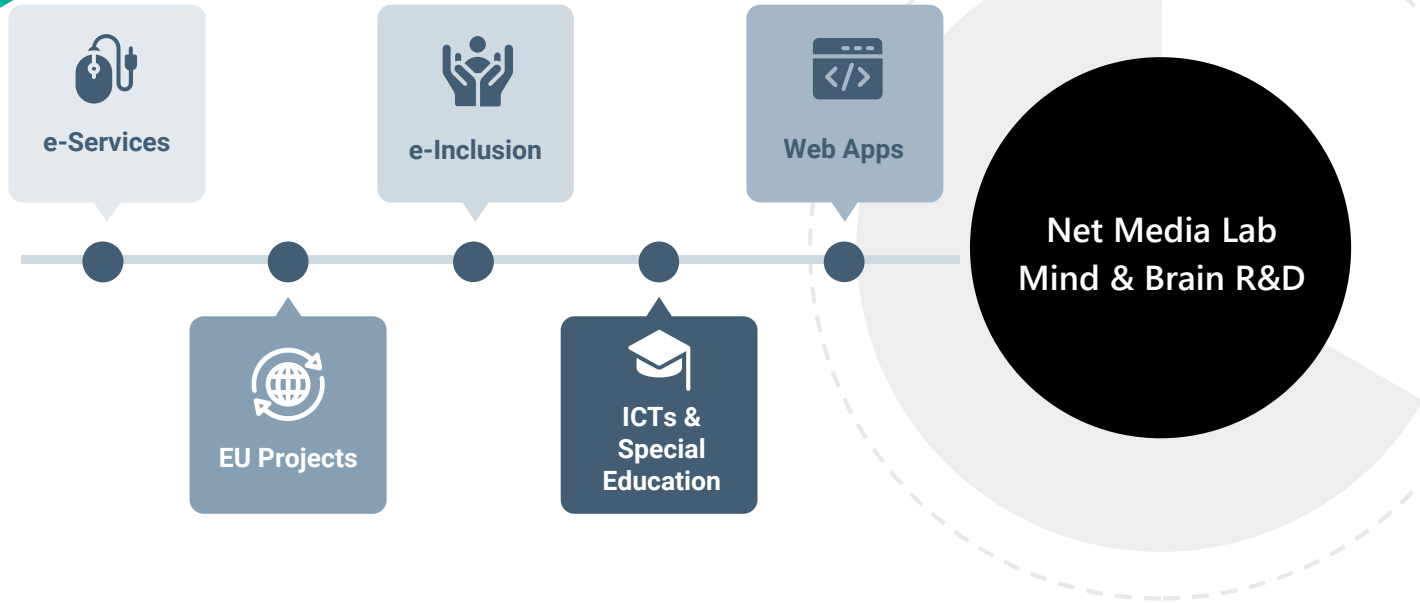
[CONTACT](#)

Net Media Lab

Mind & Brain R&D

[POSTGRADUATE DEGREE](#)

[SEMINARS](#)



Education

Interinstitutional - Interdepartmental Postgraduate Programme organized by the Department of Greek Philology of the Democritus University of Thrace and the Institute of Informatics & Telecommunications (I.I.&T.) of the National Centre for Scientific Research "Demokritos" entitled "Specialization in ICTs and Special Education: Psychopedagogy of Inclusion"

<http://specialedu.iit.demokritos.gr/>

Many PhD Degree Theses Researches, Studying ICTs for Cognition and for Various Fields in Special Education

<http://imm.iit.demokritos.gr/team/>

Annual Seminar entitled "Specialization in ICTs and Special Education"

<http://imm.iit.demokritos.gr/seminars/>

Training Activities within EU Projects

- "Seniors Go Digital: Promoting Inclusive Strategies for Disadvantaged Seniors" training activity
- "CODESKILLS4ROBOTICS: Promoting Coding & STEM Skills through Robotics: Supporting Primary Schools to Develop Inclusive Digital Strategies for All" Short-Term Joint Staff Training Event

<http://imm.iit.demokritos.gr/education>

Who Used our Studies - Publications

Ministries & Parliaments (17) / 15 countries: USA (3), Kenya, Equator, Santa Lucia & 11 South-Eastern Ministries of Asian countries (Singapore, Malaysia, Indonesia, Thailand, etc.)

Research & Innovation Councils (5) / 4 countries: Canada, UK (2), Ireland, Israel & Bangladesh.

International Organizations Policies (7): EU Policies (3), EU Distinction, UNESCO, OECD, CIPD & African Development Organization.

Other Policy Bodies studies (22) from 13 countries including USA, South Korea, India, Brazil, Germany, Saudi Arabia, Sweden, Portugal & 21 Latin American countries.

Moreover, it has accepted calls from **Ireland's and Israel's National Research Councils** to evaluate proposals in their **National Laureate Framework Programs** and accepted a call from an **Indian University** to participate in the **evaluation committee** of a PhD Thesis.



DEMOKRITOS

Distinctions

1

A new policy report of **European Commission** includes a Net Media Lab's Study for ICT's and **AI in Special Education (2019)**

2

A Net Media Lab's study was cited by the American Governmental report entitled: "**Environmental scan of educational technology in U.S. public schools**" (2018)

3

A Net Media Lab's study-article has been included in the **CIPD** Strategic Study entitled: "Rapid evidence review. Impact of **artificial intelligence**, robotics and automation technologies on work, targeting Global **Labor Market**" (2017)

4

The Net Media Lab's **project ieWomen** is the unique project from Greece that is referenced in the Europe's Digital Progress Report (**EDPR**) 2017 Country Profile Greece and has assigned the title "Highlight of the year 2017".

5

A Net Media Lab's study-article has been included in the **OECD** Strategic Proposal entitled: "Making Innovation Benefit All: Policies **for Inclusive Growth**, targeting Country Members" (2017)

6

A NET MEDIA LAB's study - article has been included in a report on Virtual Learning Environments VLEs & **DYSLEXIA** for **National Policy in UK** (2016)

A Net Media Lab Study has been included in a German National Policy Report for AI @Education

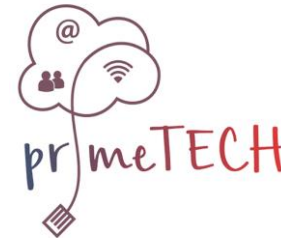
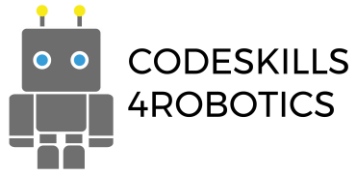
A Net Media Lab Mind-Brain R&D's Research on AI in Special Education has been included in a Policy Document by the National Research Council of Canada. 2021.

A Net Media Lab Mind-Brain R&D's Research on AI in Special Education has been included in a Strategic Policy Recommendation by OECD. 2021.

A Net Media Lab's study – article has been included in a U.S.A. Congress, Disability National Council's Inclusion Policy Report for 2007-2014 submitted to the U.S.A. President. 2007

A Net Media Lab's study has been included in a "white paper" – strategic proposal for blockchain economy – virtual coins, and inclusive-supportive activities for people with disabilities.

Projects



3D2ACT:

Fostering Industry 4.0 and 3D Technologies through Social Entrepreneurship:
An Innovative Programme for a Sustainable Future

AIMS

- Support VET trainers and educators in an attempt to strengthen their profiles with the acquisition of new skills, the development of targeted material, the collection of tools and resources.
- Create opportunities for linking VET schools with the labour market building on synergies and partnerships with established organizations using industry 4.0 and automation or 3D printing and Robotics.

CONSORTIUM

P1: N.C.S.R. "Demokritos" –
Greece

P2: European Digital Learning
Network –
Italy

P3: Politeknika Ikastegia Txorierrri –
Spain

P4: Emphasys Centre –
Cyprus

P5: Incubator Leeuwarden –
Netherlands

P6: Regional Directorate of
Primary and Secondary
Education of Crete –
Greece

P7: University of Crete –
Greece



3D2 CT

Strategic Partnerships for
Vocational Education and Training
2020-1-EL01-KA202-078957

30 months
(1/12/2020 - 31/5/2023)



Erasmus+

<https://3d2act.eu/> | <https://3d2act.iit.demokritos.gr/>

DigiTeaL:

Digital Teaching Literacy

AIMS

- Identify training needs and skill gaps around teachers' online teaching capability in the partner countries.
- Create a practical, step-by-step resource that guides teachers through the technical elements of setting up safe online teaching, using identified best practice, and giving them confidence if they have mainly focused on face-to-face teaching in the past.
- Inform teachers about the non-technical issues classroom management associated with online teaching, and provide solutions.
- Make teachers aware of an internationally recognized online assessment system that they can adapt for their students in any subject.

CONSORTIUM

P1: University of
Wolverhampton –



UK

P2: Emphasys Centre –



Cyprus

P3: N.C.S.R. "Demokritos" –



Greece

P4: Bennohaus –



Germany

P5: University of Bucharest –



Romania



DigiTeaL

Strategic Partnerships for
School Education
2020-1-UK01-KA226-SCH-094429

18 months
(1/6/2021 - 30/11/2022)

JOBS4ALL:

Strengthening the Employability and Key Competences of Young People with Disabilities Through the Digital Transformation and Modernisation of Youth Work

AIMS

- Strengthen Young People with Disabilities (YPwDs) employability skills by improving existing training programmes integrating technology-based tools to enable young people into adulthood & effectively support their integration into the labour market.
- Advance training opportunities offered for a vulnerable group of the population through the advancement of YOUTH programmes on EMPLOYABILITY SKILLS.

CONSORTIUM

P1: N.C.S.R. "Demokritos" –

Greece

P2: Associação Portuguesa para as Perturbações do Desenvolvimento e Autismo de Coimbra –

Portugal

P3: Learning Center for Youth –

Cyprus

P4: Metropolisnet-European

Metropolis Employment Network EWIV –

Germany

P5: Emphasys Centre –

Cyprus

P6: 2 EPAL Agias Paraskevis –

Greece

P7: Zespół Szkół Specjalnych im. Janiny

Porazinskiej w Ignacowie – **Poland**



JOBS4ALL

Strategic Partnerships for
Youth Education
2021-2-EL02-KA220-YOU-000049207

30 months
(2/5/2022 - 1/11/2024)



Erasmus+

DRONES@STEAM:

Fostering Digital Transformation in VET Schools and Creating New Job Prospects in the Labour Market

AIMS

- Promote high digital skills which appear to be missing from VET curricula and are currently needed to enter the labour market and be included in VET job profiles.
- Promote targeted 'wide and deep' digital competences and the use of technologies leading to the 4.0 industry.
- Promote job specific VET related skills for various fields and sectors which are not offered as work-based learning opportunities or include danger or hazards for the workers.

CONSORTIUM

P1: University of Crete –

Greece

P2: ECAM-EPMI –

France

P3: Cyprus Computer Society –

Cyprus

P4: Politeknika Ikastegia Txorierrri –

Spain

P5: N.C.S.R. “Demokritos” –

Greece

P6: Emphasys Centre –

Cyprus

P7: Regional Directorate of Primary and Secondary Education of Attica –
Greece



ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ
UNIVERSITY OF CRETE



CYPRUS
COMPUTER
SOCIETY



POLITEKNIKA IKASTEGIA
TXORIERRI
S.COOP.



DEMOKRITOS



DRONES STEAM

Strategic Partnerships for
Vocational Education and Training
2021-1-EL01-KA220-VET-000034686

28 months
(28/2/2022 - 27/6/2024)



Erasmus+

<http://dronesteam.eu/>

2

Digital Skills, Competences and STEM Internationally

The OECD Jobs Strategy Dashboard for labour market performance compares labour market performance of countries based on five outcome dimensions that contribute to inclusive growth and well-being – Greece highlighted

Source: <https://www.oecd.org/employment/jobs-strategy/country/>






CONNECTIVITY


HUMAN CAPITAL

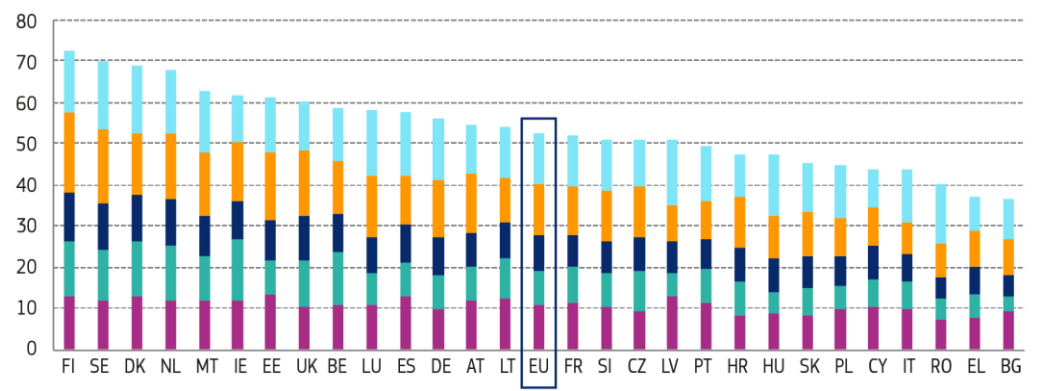

USE OF INTERNET SERVICES


INTEGRATION OF DIGITAL TECHNOLOGY


DIGITAL PUBLIC SERVICES

The Digital Economy and Society Index (DESI) is a composite index that summarises relevant indicators on Europe's digital performance and tracks the evolution of EU Member States in digital competitiveness

Source: <https://ec.europa.eu/digital-single-market/en/digital-economy-and-society-index-desi>

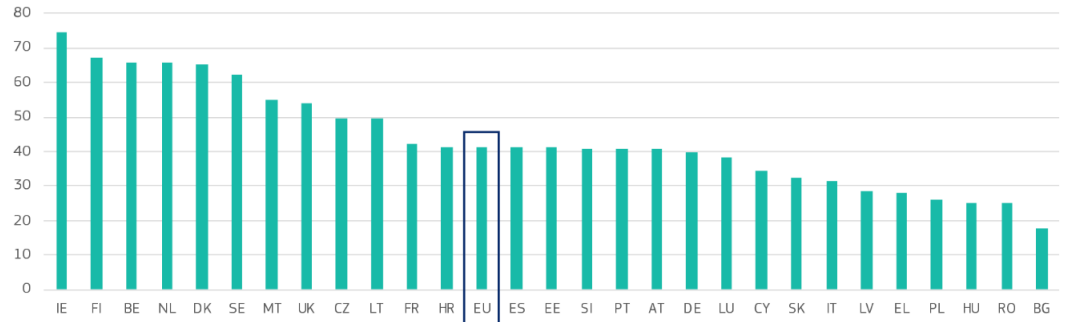




INTEGRATION OF DIGITAL TECHNOLOGY

DESI indicator regarding the integration of digital technology

Source: <https://ec.europa.eu/digital-single-market/en/digital-economy-and-society-index-desi>

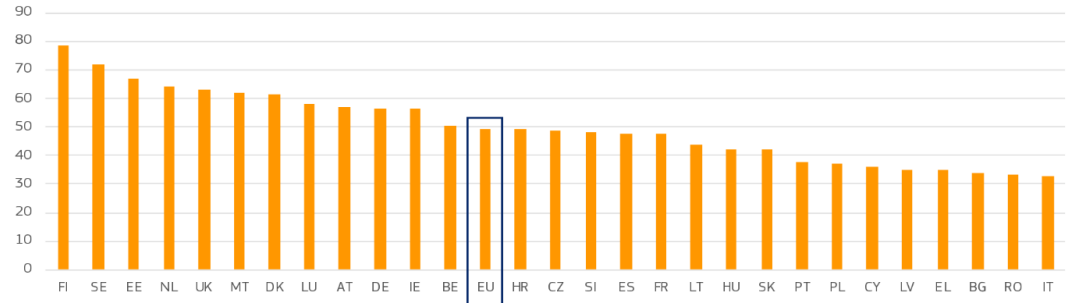




HUMAN CAPITAL

DESI indicator regarding the human capital

Source: <https://ec.europa.eu/digital-single-market/en/digital-economy-and-society-index-desi>



3

Δεξιότητες 21^{ου} Αιώνα

Exhibit 1: Students require 16 skills for the 21st century



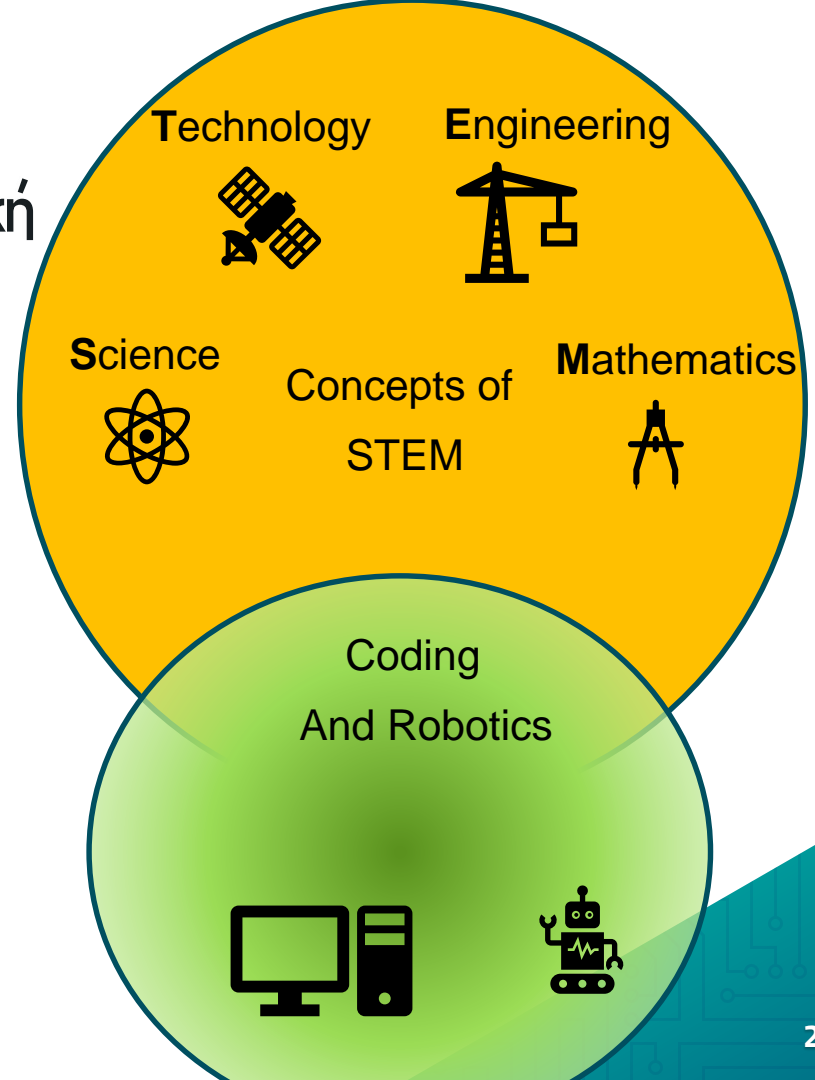
Note: ICT stands for information and communications technology.

S.T.E.M. και Εκπαιδευτική Ρομποτική

Διαθεματική προσέγγιση στη διδασκαλία

- Φυσικές Επιστήμες (Science).
- Τεχνολογία (Technology).
- Μηχανική (Engineering)
- Μαθηματικά (Mathematics)

Η Εκπαιδευτική Ρομποτική περιλαμβάνει όλους τους τομείς STEM



4

S.T.E.M. & Ειδική Αγωγή

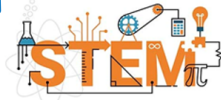
Γνωστικές Μεταγνωστικές δεξιότητες και S.T.E.M.

- Περισσότερο ανεπτυγμένες τις μεταγνωστικές δεξιότητες τους τείνουν να αποδίδουν καλύτερα στις φυσικές επιστήμες σε σχέση με μαθητές που τις έχουν λιγότερο ανεπτυγμένες.
- Όταν εκπαιδεύουμε τους μαθητές σε μεταγνωστικές δεξιότητες βελτιώνεται και η απόδοση τους στις Φ.Ε και αντίστροφα.
- Ωφελούμενοι περισσότερο από την διαδικασία είναι η μαθητές με την χαμηλότερη απόδοση οι οποίοι βοηθούνται να βελτιώσουν τον τρόπο σκέψης τους.

**Γνωστικές και
Μεταγνωστικές
Δεξιότητες**



**Μαθησιακές
Δυσκολίες**



Γνωστικές Μεταγνωστικές δεξιότητες και S.T.E.M.

Το να εκπαιδεύεται κανείς στις Φ.Ε. απαιτεί αλλά και εκπαιδεύει ένα πλήθος Γνωστικών / Μεταγνωστικών Δεξιοτήτων (Raghavan, & Zeitz, 1992)

- Ανάγνωση και Φ.Ε.
 - Γλώσσα (language)
 - Συσχέτιση ιδεών (association)
- Ικανότητες Επίλυσης Προβλημάτων
 - Επίλυση προβλημάτων (problem solving)
 - Αντίληψη (perception)
 - Μνήμη (memory)
 - Οπτική και χωρική επεξεργασία (mental imagery)
- Ανακαλυπτική και διερευνητική μάθηση
 - Σχηματισμοί των εννοιών (concept formation)
 - Αναγνώριση Προτύπων (pattern recognition)
 - Δράση (action)
- Επαγωγική σκέψη και εννοιολογική αλλαγή
 - Προσοχή (attention)



Μαθησιακές Δυσκολίες & S.T.E.M.

Υποστήριξη των Μαθητών με Μ.Δ

Ενσωμάτωση Διερευνητικών δραστηριοτήτων



Οφέλη

- ✓ Παρέχει πολυαισθητηριακά δεδομένα
- ✓ Ενθαρρύνει την ενεργή μάθηση
- ✓ Παρέχει κίνητρα στους μαθητές
- ✓ Περιορίζει σε μεγάλο βαθμό την ανάγκη για διάβασμα από το εγχειρίδιο
- ✓ Συμβάλει στην κοινωνική ενσωμάτωση



Προϋποθέσεις επιτυχίας

- ✓ σαφή στοχοθέτηση
- ✓ χρήση χρονοδιαγράμματος
- ✓ εμπλουτισμό με την χρήση οπτικών αναπαραστάσεων
- ✓ έμφαση σε λίγες και σημαντικές έννοιες χρήση εποπτικού υλικού
- ✓ προσαρμογές στο ρυθμό διδασκαλίας

(Dalton, Morocco, Tivnan, & Rawson Mead, 1997; Palincsar et al., 2001)

Social Robot & Ειδική Αγωγή

Τα ρομπότ μπορούν να παίξουν ρόλο εμπνευστική και ενισχυτή για την ανάπτυξη κοινωνικών δεξιοτήτων. Οι βασικές κατηγορίες «Κοινωνικών Ρομπότ» είναι :

- 🕒 Βοηθητικά ρομπότ (Assistive robots, AR):
- 🕒 Κοινωνικά διαδραστικά ρομπότ (Socially interactive robotics, SIR)
- 🕒 SAR (Social Assistive Robots)
- 🕒 Ρομπότ Γνωστικοί σύντροφοι (Cognitive robot companions)

(Pennazio, 2017)



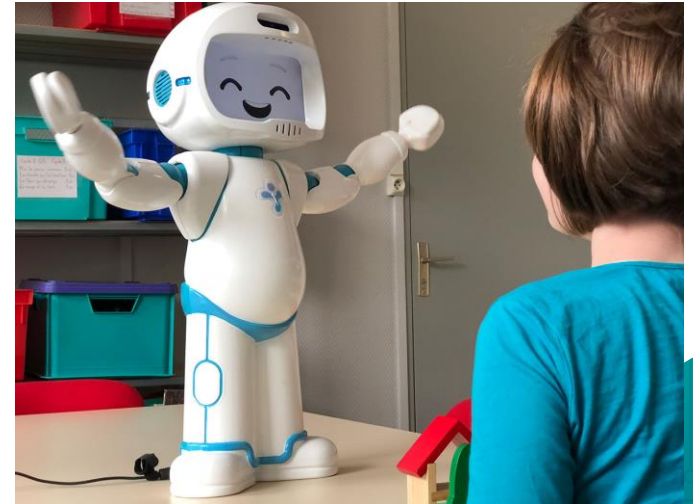
Social Robot & Ειδική Αγωγή

🕒 Διαταραχή Αυτιστικού Φάσματος

- Διαγνωστικό Ρόλο
- Βοηθός Παιχνιδιού
- Ενισχυτής και παραγωγός Συμπεριφορών (μίμηση, βλεματική επαφή)
- Κοινωνικός διαμεσολαβητής
- Κοινωνικός Βοηθός
- Προσωπικός Βοηθός

🕒 Συμπεριφορές που προκαλούν

- Μίμηση
- Εστιασμένη Προσοχή
- Έναρξη Κοινωνικής Αλληλεπίδρασης
- Κοινωνική Αλληλεπίδραση



(Mitsea, Lytra, Akrivopoulou, & Drigas, 2020 – Pennazio, 2017)

Social Robot & Ειδική Αγωγή



Νοητική Αναπηρία

- Κινητικές Δεξιότητες
- Γνωστικές Δεξιότητες
- Κοινωνικές Δεξιότητες



Διαταραχή Ελλειμματικής Προσοχής Υπερκινητικότητας προσοχή φαίνεται να παίζει κεντρικό ρόλο στα παιδιά με ΔΕΠΥ.

- Εκφράζει αλλά και να αντιλαμβάνεται αισθήματα
- Να επικοινωνεί με διαδραστικό τρόπο
- Να χρησιμοποιεί μη λεκτικούς τρόπους επικοινωνίας
- Να επιδεικνύει στοιχεία ύπαρξης προσωπικότητας.
- Επιπλέον περιελάβανε μηχανισμούς εντοπισμού διάσπασης της προσοχής του παιδιού μέσω αισθητήρων

- θεωρούν το ρομπότ ένα παιχνίδι ή και έναν φίλο και μπορούν να αναπτύξουν μια σχέση με αυτό



(Van Den Heuvel, Lexis, & De Witte, 2017 – Vélez & Ferreiro, 2014)



Publications

https://www.researchgate.net/profile/Athanasios_Drigas/research

MORE THAN 390 PUBLICATIONS

- ✓ S.T.E.M.: Inquiry-Based Learning and **Gifted Education**
- ✓ Stress, Anxiety & Mental Health Problems in **Gifted Adolescents**
- ✓ ICTs, Mindfulness and **Emotional Intelligence** in Inter-National Educational Policies
- ✓ The 8 Pillars of **Metacognition**
- ✓ Mobile Applications, An Emerging Powerful Tool for **Dyslexia** Screening and Intervention: A Systematic Literature Review
- ✓ The Need for **Emotional Intelligence** Training Education in Critical and Stressful Situations: The Case of Covid-19
- ✓ The Role of **Sleep** and Impact on **Brain** and Learning
- ✓ **Brain computer interface** based applications for training and rehabilitation of students with **neurodevelopmental disorders**. A literature review
- ✓ **Mobile** and other applications for **mental imagery** to improve learning disabilities and mental health
- ✓ **Parents'** Involvement in the Education of their **Children with Autism**: Related Research and its Results

Ευχαριστώ

Ερωτήσεις?

Μπορείτε να με βρείτε:

📧 dr@iit.demokritos.gr