

«Διημερίδα Υποψηφίων Διδασκτόρων Τμήματος Μηχανικών  
Πληροφοριακών και Επικοινωνιακών Συστημάτων»

4-6-2022

## “A Conversational Agent as a personal and professional development tool for healthy aging and sustainable living”

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# Why a conversational agent?



The tutorial methodology of structuring an active dialogue and, in particular, in the manner of asking questions and eliciting answers related to a subject material, dates back to the Socratic dialogues and Plato's academy (Stanford University).

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# Aims

It is an interactive, digital tool introducing a framework of personal & professional development on the basis of cognitive science, & natural language understanding.



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# Architecture

- Εργαλείο Ανίχνευσης Γνωστικών & Μεταγνωστικών Ικανοτήτων and Cognitive & Metacognitive Skills Self-Assessment Tool with a predefined clustering of users based on their quantifiable results.
- Six pillars: human resources management, 9-Layered Model of Giftedness, mental health training, ICTs & the society, brain training & brain health assessment scales.
- In the long run, the data captured by the tool can be used to model the users' demographics and skills in order to enhance its automation.



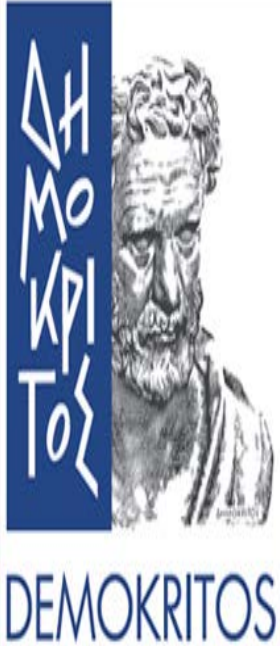
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# Functionality

- ❑ Prototype Project
- ❑ Backend: Dialogflow, Google Cloud Platform (Google Sheets API & Google Drive API)
- ❑ Frontend: Integration with Google Assistant, Botcopy, Messenger or other platform



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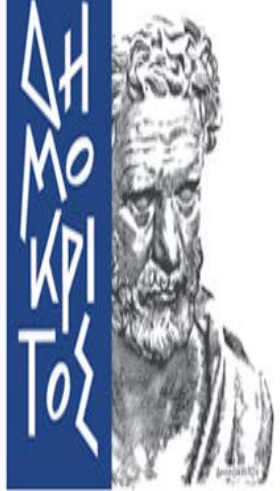


# Originality

- ❑ Self-regulated and flexible learning with conversational guidance.
- ❑ Free inclusive features given by Google Assistant eg. multiple languages, Text to Speech Voice Reader.
- ❑ User-friendly interface design.
- ❑ Personal and professional development: lifelong learning opportunities, Sustainable Development Goals (United Nations).
- ❑ Theoretical framework: success is a dynamic construct inherent to reciprocal assistance, reciprocity (Hauser, 2003) and thus, to social evolution (Boyd & Richerson 1996; Clutton-Brock 2002).



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# Context



Six pillars: human resources management, 9-Layered Model of Giftedness (Bandura's Social Cognitive Learning Theory, Vygotsky's Theory of Social Constructivism and Sternberg's Successful Intelligence), mental health training, ICTs & the society, brain training & brain health assessment scales.

The structure of the prototype is based on interdisciplinary research on the physiological and psychological processes as well as ethical issues that promote cognitive functions and applied skills.

We embrace EU regulations about making citizens independent self-starters, who are responsible, persevering, self-regulating, reflective, self-evaluating and self-corrective (European Commission).

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# Target Group

Seniors, employees and managers in the labour market, educators, researchers, scientists and everybody in search of healthy aging as well as in need of personal and professional development.



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# Use Case Scenarios: “Transform a school”



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We point to the role of educators and teachers as constant inspiration for their trainees and students in a dynamic, reciprocal interaction that forms the latests' personality and learning capacity.

Neurocognitive changes can occur structured on biological evolution and training in self-regulation processes as a result of education .



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# Use Case Scenarios: “Transform an organization”



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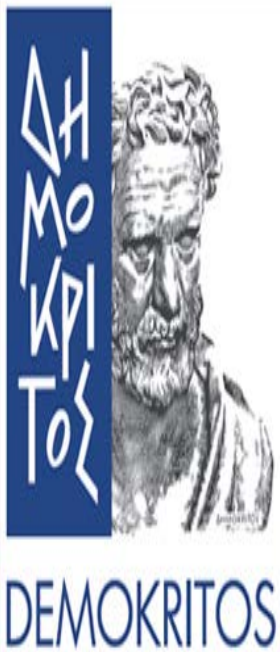
Herzberg's theory & 9-Layered Model of Giftedness: the set of abilities that give a person the potential and the need to share knowledge and skills as a mechanism of intrinsic motivation.

Managers can do more than diagnose the motivation problems of employees. They can help their employees to identify exactly why the task seems insurmountable so that they can move past such difficulties (M. M. Siruri and S. Cheche, 2021).



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# Use Case Scenarios: “Transform the society”



Our model emphasizes on lifelong learning skills and the way they can be integrated in the promotion of our cognitive and mental health.

Lifelong learning is especially tied to cognitive flexibility and self-regulation skills (executive functions).

Cognitive flexibility refers to the ability to shift between response sets, learn from mistakes, devise alternative strategies, divide attention and process multiple sources of information, concurrently (A. Drigas, M. Karyotaki, 2019).

Furthermore, cognitive training can lead to the synergistic development of individuals' cognitive and emotional components in terms of promoting our emotional and social well-being (A. Drigas, M. Karyotaki and C. Skianis, 2018).



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# Conclusions

Our main field of research stands in the intersection of Cognitive Science & ICTs with special emphasis on self-consciousness and self-improvement.

Healthy individuals that become successful professionals, carrying more positive feelings than negative feelings play an eminent role in the economic development of all countries and communities.

The tool complies with EU values: inclusiveness, resilience, adaptability and social responsibility



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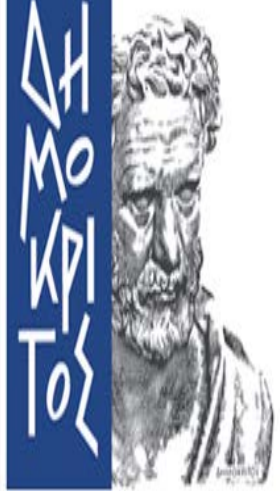
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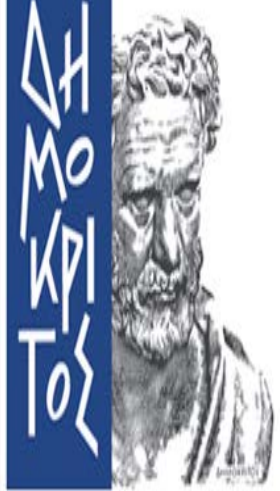
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# Biographies



Maria Karyotaki was born in Greece. She has studied Economics and Sustainable Development and she holds a Master's degree in Educational Psychology at Harokopio University, Athens, Greece. Maria's major field of study is Brain Sciences, Education & ICTs.

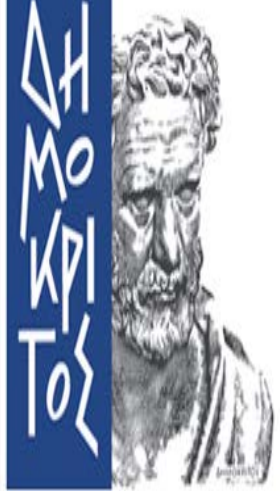
She is a PhD Candidate in the Department of Information and Communication Systems Engineering (ICSE) at the University of the Aegean, Karlovassi, Greece in collaboration with N.C.S.R. "Demokritos", Institute of Informatics and Telecommunications, Telecoms Lab - Net Media Lab & Brain-Mind R&D, Athens, Greece. Three of her most recent published articles are: M. Karyotaki, "Consciousness through the scope of the 9-Layered Model of Giftedness", in Society Consciousness Computers, vol. 7, pp. 90, 2021, ISSN 2359-7321. M. Karyotaki, "Cognitive skills' contribution to Citizenship Education", in e-Conference Proceedings Promoting EU values in a time of social distancing, Erasmus+ KA3 Teachers4Europe: Setting an Agora for Democratic Culture (2018-2021), pp. 73-80, May 2021, ISBN: 978-960-6897-12-2. A. Drigas, M. Karyotaki and C. Skianis, "Success: A 9 Layered-based Model of Giftedness", iJES, vol. 5, no. 4, pp. 41-50, 2017, <https://doi.org/10.3991/ijes.v5i4.7725>. Her current research interests are chatbots, cognitive computing systems, lifelong learning skills and healthy a



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# Biographies



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Dr. Athanasios Drigas is a Research Director at IIT-N.C.S.R. Demokritos. He is the Coordinator and founder of Net Media Lab Mind-Brain R&D. He was the Operational manager of the Greek Academic network Ariadne. He has been the Coordinator of Several International Projects, in the fields of ICTs, and eservices (e-learning, e-psychology, e-government, e-inclusion, e-culture etc). He has published more than 300 articles, 7 books, 25 educational CD-ROMs and several patents. He has been a member of several international committees for the design and coordination of Network and ICT activities and of international conferences and journals. Also, he has accepted several distinctions for his work (articles, projects, patents).



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# Biographies



Prof. Charalabos Skianis (Senior Member IEEE) (m) is currently Professor, Vice-Rector at the University of the Aegean in Samos, Greece. He holds a PhD degree in Computer Science, University of Bradford, United Kingdom and a BSc in Physics, Department of Physics, University of Patras, Greece. His work is published in journals, conference proceedings and as book chapters and has also been presented in numerous conferences and workshops. He acts within Technical Program and Organizing Committees for numerous conferences and workshops (e.g., IFIP Networking 2006, IEEE Globecom 2006, IEEE ICC 2006) and as a Guest Editor for scientific journals (e.g., IEEE Networks magazine). He is at the editorial board of journals (e.g., IEEE Wireless Communications), a member of pronounced professional societies (senior member of IEEE) and an active reviewer for several scientific journals. He is an active member of several Technical Committees within the IEEE ComSoc (e.g., TC CSIM-chair).

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Σας ευχαριστούμε,

