

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

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Abstract: We present a pioneering tool in the field of cognitive and mental health promotion that can be integrated with IoT devices to address the need for an adaptable and immersive training experience in formal and informal learning environments, such as large-scale organizations and businesses, schools and universities. It is based on the dialogic form in acquiring knowledge, introduced by Socrates as a training and teaching methodology. The current tool is the product of a transdisciplinary research in the field of ICTs as reflected on Cognitive Science, Neuroscience, Education and the Business Sector. It is also part of an innovative model of personal and professional development, called the 9-Layered Model of Giftedness, which originates mainly in Plato's prompt to discover the nature of excellence and the ability to teach excellence through self-reflection and self-awareness.
Keywords: healthy aging, intelligent tutoring systems, chatbots, cognitive skills

1 Introduction

This app aims at providing a digital tool towards training and assessment of higher cognitive and metacognitive skills to the benefit of a person's personal and professional development. The architecture of this tool is based on the 9 Layered Model of Giftedness, which is an integrated theory of human wellness and societal prosperity [1]. In addition, the architecture of the tool provides a tailor-made user experience as it is structured on a voluminous menu, encapsulating the 21st Century Skills of the European Skills Agenda [2] in combination with the Sustainable Development Goals of the United Nations by 2030 [3]. More specifically, the app offers users the capability to take a test that makes an assessment on their cognitive and metacognitive skills in order to give recommendations on their training needs. Therefore, the app gives users feedback as a navigation route, following a string of replies.

The original conception of the app was founded on the Ancient Greek Philosopher, Socrates and his

method of teaching and thinking [4]. Socrates made questions and sought the answers from his students in an attempt to let them discover what is the truth. For that purpose, Socrates made inquiring and critical thinking questions. Our app induces a holistic perspective in human evolution as we encourage users to embrace a new model of intelligence that encompasses a person's capacities, abilities and skills in combination with certain values and self-beliefs. As a result, our app aims to introduce our theoretical model to a broader audience as well as to emphasize on personal development as a means of social evolution [5]. In addition, our model addresses personal and professional development as an individualized goal for any person that has the will and the perseverance to learn and improve oneself. Thus, if this applies wider, our society stands a better chance to thrive in the future.

2 Context

The app has six pillars: human resources management, 9-Layered Model of Giftedness, mental health training, ICTs & the society, brain training & brain health assessment scales. Each pillar includes a comprehensive amount of knowledge originating from published research with emphasis on cognitive and metacognitive skills, 21st Century Skills as well as the skills related to the Sustainable Development Goals of the United Nations Agenda by 2030.

This tool is in line with the European Skills Agenda of the EU, EU priorities and the Sustainable Development Goals by 2030, such as lifelong learning, healthy aging and social equity [2, 3]. Also, it embraces the standards of the World Health Organization for health promotion [6]. The skills of the European Agenda that are also included in the app are: problem solving and decision making, creative and critical thinking, collaboration, communication and negotiation, intellectual curiosity as well as the ability to find, select, structure and evaluate information. In addition, another critical skill that the European Union and our app embraces is to make citizens independent citizens, who are responsible, persevering, self-regulating, reflective, self-evaluating and self-corrective. All the skills mentioned are inherent to the lifelong learning skills that make citizens flexible, adaptable and resilient individuals.

The first pillar “human resources management” comprises self-leadership skills as well as incentives that motivate employees, especially in large organizations. By the term “self-leadership skills”, we entail lifelong learning skills oriented towards one’s healthy living and healthy aging in combination with the 21st Century Abilities that form the identity of the citizen of the 21st Century, in Europe and worldwide. In our model, citizens of the 21st Century are initiated into the skills and values that can make them active, creative and innovative both for themselves and the society, in general. Moreover, employee engagement is a very important factor, affecting a person’s professional and personal life in addition to the systemic effects taking place in that person’s environment. More specifically, we embrace the Theory of Existence, Relatedness and Growth (ERG Theory) by Clayton Alderfer [7] as well as Herzberg’s Theory of Motivation [8] to describe how employees working in large organizations can work more effectively in groups and how to improve their working environment through healthy working relations and fruitful cooperations.

The second pillar “9-Layered Model of Giftedness” explains how the model connects to several aspects of cognition, emotion and human behavior, in general. As the app aims at affecting human behavior through developing a person’s skills and values, this pillar presents in detail, a set of higher cognitive and metacognitive skills, values and self-beliefs that can affect all aspects of human life, through combining several scientific fields, such as Brain Sciences, Economics, Human Resources

Management, Education Studies and Psychology. Therefore, the current pillar has an interdisciplinary view on how to succeed in a person's personal and professional development. In addition, our model places certain values and self-beliefs in top priority to the benefit of the person, itself, as well as to the benefit of the entire society as a whole. Moreover, this app introduces our theory and launches an alternative construct of intelligence, more dynamic, trainable and oriented towards a behavior-centered approach [9].

The third pillar "Mental Health Training" emphasizes on the neurophysiological function of the brain, brain health prevention in combination with a person's social and emotional health. More specifically, our theory looks into our mental health both as an innate and a social construct. Therefore, our app embraces three theories that focus on the intrinsic and extrinsic factors that relate to how we build our emotional and social self and how to be happy with it. The theories are: Bandura's Social Cognitive Learning Theory [10], Vygotsky's Theory of Social Constructivism [11] and Sternberg's Successful Intelligence [12]. Moreover, this pillar focuses on cognitive skills training and assessment, methodologies and tests, in combination with informing users of the neurodegenerative diseases that cause severe dysfunction in our basic cognitive function, our memory, such as Alzheimer's Disease and dementia.

The fourth pillar "ICTs & the Society" introduces the role that ICTs can have on the evolution of human intelligence and more specifically, it shows how ICTs train our cognitive and metacognitive skills in addition to promoting the values that serve the needs of the citizens of the 21st Century, such as inclusiveness, resilience, adaptability and social responsibility [13].

The fifth pillar "Brain Training" suggests three principal components in brain training techniques. These include physical training, mental imagery/visualization and mindfulness meditation [14, 15]. The sixth pillar "Brain Health Assessment Scales" presents published assessment scales revealing a full scope of our brain health comprising our healthy living, our brain function, our brain plasticity and the degree of our self-knowledge.

3 Training & learning Methodology

Furthermore, all the aforementioned pillars form a holistic construct, depicting that our skills, our values and self-beliefs are reciprocally related and they all affect the physiological and psychological health of the brain as it reflects on our behavior.

In addition, its dialogic system uses the potential of natural language understanding as a means for physiological and psychological training in combination with the promotion of values/self-beliefs that enhance their cognitive and mental health. It also offers a tailor-made experience to the user through giving them the opportunity to use the Cognitive & Metacognitive Skills Self-Assessment Tool. Finally, the app can offer further support to the users in need of further clarifications and specifications, by the creator of the application.

4 Benefits

The current tool is founded on the 9-Layered Model of Giftedness, an innovative theory about intelligence and consciousness. It can assist in training human cognition and emotion, which involves the acquisition of a set of cognitive and metacognitive skills in combination with the enhancement of other personal characteristics, such as volition, perseverance, wisdom and prudence. It also explains the role of self-consciousness by presenting a holistic model of self-improvement and intensifying the role of knowing ourselves in order to understand other people and capture the meaning of things around us. The tool is characterized by its emphasis on humans' ability to learn from each other, improve each other as well as it promotes the idea that humanism is the ultimate value. More

specifically, its rationale is to encourage sharing knowledge, skills and personal virtues with others in order to live better now and in the future. According to our model, the final goal of reaching our highest potential is to share our skills and knowledge with other people around us and reach universal consciousness. In sum, the current tool provides a tailor-made learning experience with the aim to endorse self-improvement and lifelong learning skills, while preserving public health and transforming future societies.

Furthermore, the originality of the tool stems from the fact that it is a digital, cognitive and mental health promotion tool with a holistic and a broad scope of human behavior as well as a social empowerment tool. It represents a well-illustrated, interdisciplinary overview on cognitive improvement and brain health as it integrates Neurosciences, Philosophy, Economics, Education Studies and ICTs. It initiates a new meaning in the terms “intelligence” and “consciousness” and it can promote lifelong learning among interested stakeholders in the field of public health, politics and education. Moreover, it is a digital library with cutting-edge research in the field of Cognitive Science, Neuroscience as well as Democratic Society.

Furthermore, the tool introduces the 9-Layered Model of Giftedness to the entire world and specifically, aims to make people realize the importance of cognitive skills in combination with personal values in order to form a citizen of the world that respects human rights, acts in respect of equity, peace and considers the protection of the environment and the world, in general, a personal matter. Therefore, this citizen of the world believes in diversity and social sustainability as a means to combat racism, discrimination and violence.

Current circumstances, such as in the case of the pandemic of Covid-19, make resilience and social responsibility vital skills for the survival of humankind. Moreover, resilience and adaptability are irreplaceable skills for any person. Furthermore, applied skills, such as critical thinking, problem solving, communication, teamwork/collaboration, information technology, leadership, creativity/innovation, lifelong learning/self-direction, professionalism/work ethic, ethics, social responsibility, diversity, are not officially taught in greek schools, although they are necessary in any working environment and in any society, worldwide [16]. Therefore, we argue that the current application was designed to have a strong impact on society. The next step of our research is to test it on large companies or organizations with multiple employees/students. We also suggest that school curricula and educational systems worldwide should embrace a holistic education approach [17].

5 Target group

The target group of the app is broad as its potential users are adults, but especially seniors, employees and managers in the labor market, educators, researchers, scientists and everybody in search of healthy aging as well as in need of personal and professional development. Also, managers and stakeholders in the field of human resources can use the app and its theoretical background to invest in human capital and reach their goals for successful management and effective policies. Furthermore, our app should be used by stakeholders in the field of education who have a key role in human evolution because they are responsible for making future citizens set out for a dynamic society. By dynamic society, we mean a society that is founded on a framework of skills, values and self-beliefs that can bring about health and individual success for citizens [18].

6 Use Case Scenarios

Both our theory and our application aspire to launch an integrated model of cognitive and mental health promotion based on our higher cognitive and metacognitive skills training, throughout our lives.

At this point, we present a use case scenario embracing our model.

6.1 Scenario 1: "Transform a business organization"

As cognitive skills and personal strengths are interrelated and both depend on our effort to improve ourselves, self-improvement becomes a top priority for the state and the business sector as well as a personal goal for all people. Large organizations, with numerous staff, develop a very complex and dynamic scenery of relations that demands the presence of a clear cut set of values and skills that all employees need to acquire. The skills that employees of every large organization need to master are: creativity (originality, ingenuity), curiosity (interest, novelty-seeking, openness to experience), judgment (critical thinking), love of learning as well as perspective (wisdom) [19, 20].

Moreover, with self-transcendence as a top level metacognitive skill, employees would be able to share their knowledge and capabilities with their fellow employees, creating a domino effect of change in large organizations. What is more, in order to set an example to others, we need to master our own behavior and the corresponding cognitive status. Self-transcendent employees have reached their top potential as individuals and have the desire to share their knowledge and capabilities with their fellow employees. Furthermore, the 9-Layered Model of Giftedness conceives giftedness as the set of abilities that give a person the potential and the need to share knowledge and skills as a mechanism of intrinsic motivation.

Herzberg's theory and 9-Layered Model of Giftedness have found common ground in the significance they place on human motivation and especially, on our intrinsic motivation. Intrinsic motivation is related to intrapersonal skills as our inner speech forms our self-beliefs, thus intrapersonal skills are the foundation of our motivation. Intrinsic motivation also lies in strengthening our own skills and knowledge in order to be able to promote other people's skills or knowledge to the benefit of the community. According to Herzberg's Theory, employees' free expression of ideas enhances their intrinsic motivation that elevates their job satisfaction and performance levels, thus growing the overall effectiveness of an organization [8]. Therefore, 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.

7 Conclusions

The human mind is a complicated mechanism of physiological and psychological processes that originate from innate as well as environmental factors. By environmental factors, it is suggested that our brain function as well as our mental health can be affected by our everyday routines and habits. More specifically, a healthier lifestyle, including physical activity, healthy eating as well as sustainable consumption and production patterns harnesses both physiological and psychological benefits related to human health, either physical, mental or cognitive [6].

Moreover, this model is harmonized with the goals set by international organizations, such as the World Health Organization [6], the European Commission [2] and the United Nations [3], foreseeing the future of humanity in strengthening the individual mind towards building cooperations among stakeholders and organizations on the grounds of transgenerational values, such as humanity and compasssion. The aforementioned values as well as the terms common good and communal and natural harmony have been introduced to humanity by Plato [21].

Finally, the current app is a prototype with three basic goals that can be used for further research and deployment: first, our theoretic model can be applied to respective scientific fields, second, it can be used to build a machine-learning model

predicting user's training needs based on the data extracted from the Cognitive and Metacognitive Self-assessment Tool and third, it can be integrated in an intelligent tutoring system supported by IoT devices.

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