UNIVERSITY OF THE AEGEAN

FACULTY OF HUMANITIES

Department of Sciences of Pre-School Education and Educational Design

3rd Workshop on Educational Engineering

MEd. "MODELS OF EDUCATIONAL PLANNING AND DEVELOPMENT"

In cooperation with

MEd. "DIDACTICS OF MATHEMATICS, SCIENCE AND INFORMATION AND COMMUNICATION TECHNOLOGIES IN EDUCATION: AN INTERDISCIPLINARY APPROACH"

Subject: "The impact of artificial intelligence in education & its contribution to the design & development of educational units"

Rhodes, 22 June 2024

Announcement

All major social changes are associated with major communication upheavals and vice versa. The digital revolution has created a new communicative reality that is leading society along unprecedented paths on its way to full diversification. Its functions tend to disconnect from hitherto differentiating/distinctive jurisdictions as properties of persons or structures within a network of social meaning and to be linked or attributed to artificial properties of hybrid social entities beyond the control of the functionally differentiated society.

In Nicholas Luman's theory and, in systems theory in general, another reality beyond the horizon of events is implied as strongly contingent. A society *after* the functionally differentiated society, in the sense that the product can manage and redesign its production process, thus functionally integrating into the differentiated society as a hybrid social entity. A complex society of information and its complex machines.

The digital integration of communication has largely reduced the complexity of society to the cast of describable and calculable syllogisms, while at the same time transferring the referential future contingency to a representationally experienced dimension of the sample temporal space. Thus empowering the resilience of society and leading it to marginal expressions and practices through a gradual transition to a state of expanded boundaries. Where more and more diverse communication and more and more diverse society is produced. With amazing tools that combine human with social and artificial reflective function at multiple levels. From observable, to heterobservable and ultimately self

observing systems.

There is no more striking evidence for the social engineering value of systems theory than the rapid growth of the field of artificial intelligence (AI) as a new cognitive adventure. Systems theory as a communicative view of the world, with its inescapable need to select information, message and understanding proposes models that represent it informationally by reducing its complexity and making it manageable. The social engineering of systems theory is nowhere better captured than in the field of AI as a projection of intelligent behaviours onto social or informational and ultimately communicative entities, with the aim of functionally adequate management of their systemic and environmental complexity.

The term 'Artificial Intelligence' was proposed in 1955 when John McCarthy, Marvin L. Minsky, Nathaniel Rochester and Claude E. Shannon proposed 'Artificial Intelligence' as the topic of a summer study program at Dartmouth College in Hanover, New Hampshire. The definition of AI has evolved over time and today refers to the branch of computer science that deals with software and mechanisms that simulate some of the functional processes of human intelligence, such as sensory perception, learning, formal reasoning, general problem solving, speech, etc. John McCarthy briefly defined this area of computer science as "*science and methodology of creating intelligent machines*".

It is an interdisciplinary discipline, linking computer science, philosophy, mathematics, neuroscience, linguistics, psychology, and cybernetics, with the aim of emulating complex programming with the complexity of human intelligence and developing systems with intelligence or with intelligent behaviour with elements of reasoning, learning, perception and adaptation to the environment. It is divided into symbolic AI, which attempts to approximate human intelligence as a system for processing discrete symbols with high-level logical rules, and sub-symbolic or connectionist AI intelligence, which attempts to replicate with sophisticated models the complexity of human intelligence using interconnected *elementary numerical models* and statistical techniques that synthesise inductively intelligent *behaviours*.

The AI went through a period of hibernation with research funding restricted to a minimum from 1973 until about the early 1990s, because its results were not being applied in practice to a satisfactory degree. With the increase in the available computing power and speed of computers, the advent of the internet and the ability to almost simultaneously extract and process big data, AI regained popularity with large-scale applications and automatic adaptation of content to user profiles. A recent, historical milestone in AI popularity is the availability of Big Language Model applications with the historical benchmark being OpenAI's ChatGPT 3.5 on the 30th of November, 2022. This system gained 1 million users in the first

five days of its release and within a month had surpassed 180 million users. Large language models and generative AI applications, which do not just locate information sources such as search engines but compose texts, poems, images, speeches, videos and even scientific essays to such an extent that even experts find it difficult to distinguish whether they are the product of a computer or a human being, have been a source of concern for society in general and have sparked unprecedented debate at all levels about their future implications.

In conclusion, AI today is much more than the prevailing common perception. It is the expression of a new communicative capacity of societies and their members in an environment of such cognitive complexity that traditional roles and existing structures could never manage. The subsequent imprint of society. Thus AI, like any communication revolution, evokes feelings of euphoria but also fear of an impending further alienation.

By defining, impersonally and outside the context of roles, communication, AI has penetrated self-referential and self-referencing into all hitherto functionally and communicatively differentiated systems. From art and intimate relationships to science, politics and economics. Surprising societies of procedural fixation and sloth. Highlighting their structural functions as outdated social entities that are slowly but surely becoming alienated from their members.

For the education system, this development is of particular transformative importance. Apart from the fact that education contributes to socialisation, it is also undeniable that it promotes and defends the model of a different society. On the one hand, it dehumanises the human subject, as it reduces part of his cognitive capacity to a utilitarian skill, while, thanks to the cognitive content of this collectively controlled utilitarian skill, it enriches, on the other hand, his subjective learning capacity and socialises his cognitive responsibility. It therefore contributes to the change and transformation of societies, through the transition of the subject as a social entity to desired levels of development. To this end, the systems approach to education exploits the predominantly intelligent personal and social capacities and processes that AI now seems to be appropriating, entering into an informal but highly consequential competition with it as an invisible invader.

Undoubtedly, however, the new forms of social development and the consequent social challenges require, in order to manage and address them, equally new forms of processes of organisation, operation, cooperation, work and support. It is in this context that AI must be seen as a response to the challenges of the times. As a recognition of the power of man to recognise his weaknesses and through this self-awareness to improve his position in the world through science and to participate substantially in the production and emergence of

his future.

The disgusting communication about the "AI threat" as a reflexive reaction to the aggression of a market of impersonal educational packages that in the name of AI promise an individualized learning outcome without a learning process, in coherently differentiated pedagogical environments, is added to a long list of paradoxical choices in the management of yet another achievement of the functionally differentiated, complex and structurally permanently exhausted modern society. Concerns of the press: "what are the implications of the use of AI in education" raise complex, often relentless questions about the real intentions of education and its real potential to intervene in the development of people and society. But these are questions that, if asked without the systemic understanding of intelligence and intelligence, risk leading to new dead-end versions of organisational and personal defence routines. In this debate, different perceptions of society, its organisation and functioning are again confronted, while the absence of a culture of reflection further reinforces underlying negative stereotypes and defensive reflexes.

This year's Workshop on Educational Engineering aims at a first acquaintance with this new communicative, informational and cognitive reality in the field of education and attempts to define possibilities, procedures, control tools and support programs for the development of school units, through artificial intelligence, as autonomies, from the perspective of systems theory and complexity theories.

Schedule:

Saturday 22 June 2024

Hall: Auditorium of "John Dewey" , 1st floor, Kleovoulos building, 1 Dimokratias Street, Rhodes University of the Aegean/live streaming

16:00 - 16:30

Reception, introduction to the problematic of the laboratory

- Kontakos, Associate Professor of T.E.P.A.E.S., Aegean University
- Kalavasis, Fr. Professor of T.E.P.A.E.S., University of the Aegean
- Fesakis G. Professor T.E.P.A.E.S., Aegean University

16:30 - 17.30

- Keynote Speaker, Petas I. Professor, Dept. "Artificial Intelligence and Education.

17:30 - 18:15

- Engineering Laboratory Activity from the Educational Field Fesakis G. Professor T.E.P.A.E.S., Aegean University

18:15 - 19:30

- Round Table with the participation of lecturers of the MSc and speakers from the wider network of educational and non-educational, public and private organisations.

19:30

- Closing of the Workshop