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Scientific Development and Leadership in Science

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Abstract

Scientific leadership involves pioneering and leading a specific scientific field, as well as creatively guiding policies and managing scientific institutions. This article examines the relationship between leadership in science, in this two complementary concepts and scientific development within our country.

Keywords: Scientific leadership, scientific development, economic development

Recration of Everything: Is Biology the Futurity Power of the World?

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Abstract

This article explores the transformative potential of biology in shaping the future and its impact on various aspects of human life. It primarily focuses on the shift from oil-based industries to a sustainable, circular economy known as bioeconomy. The research examines the interrelationship between biophilosophy, bioart, and bioeconomy through Neri Oxman's Krebs Cycle of Creativity model, which highlights the interplay among life sciences, engineering, digital sciences, and art. This model emphasizes the significance of cultural attitudes towards nature as a crucial factor in future innovations, influencing substantial changes in the global economy. Ultimately, the article posits that bioeconomy represents a new economic paradigm for the third millennium, grounded in philosophical and artistic perspectives in biology, serving as a foundation for sustainable development aligned with nature

Educational and Research Blindness: Part 2) A Stubborn-as-a-mule Bug in the Body of Education and Educational Policy

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Abstract

The idea of the university emerged from Christian colleges or Christian scholar Faculties in Europe. In contrast, the concept of University in Iran, hasn›t set foot on the same way. In Europe, Universities and industries grew side by side, but in Iran, there was a lack of idea and philosophy behind the concept of University, which has been ignored by the founders of Universities in Iran. The primary goal of establishing universities in Iran was to train bureaucrats and technocrats to respond to the severe vacancies in governmental departments across the country, as the first priority in the modernization (and not modernity) process in Iran.

Three periods of inflation in higher education in Iran can be identified: the period from 1953 to 1979, the period from 1986 to 1996, and the period from 1996 to the present. The inflationary effects in terms of graduate unemployment were not easily noticeable during the first period because a %10 economic growth, which began in the 1960s and continued until 1978, along with the expansion of the government sector, led to the absorption of almost all graduates into the workforce. As a result, the lack of a clear idea or philosophy behind the university was not particularly evident.

After the implementation of economic adjustment policies, government hiring suddenly stopped, leading to a separation between the fields of education and employment. Graduate inflation then became a social problem. On one hand, the general education system had given up the goal of nurturing citizens and preparing them for employment in favor of focusing on university entrance exam preparation. On the other

hand, in the absence of a clear idea of the university and a suitable industrial and social context, Universities began to excessively expand masters and doctoral programs. The result is that a significant portion of unemployment is now seen among university graduates.
This article emphasizes the importance of the idea and philosophy of the university from the perspective of education tailored to societal needs and the employability of graduates. Instead of focusing on what should be taught, attention should be given to how educational programs should be structured to ensure professional success and to meet the needs of society.
The strategy of educational programs should be based on fostering the following competencies:
1. Broad-based education;
2. Critical thinking skills;
3. A desire for lifelong learning;
4. Professional competency and proficiency.
The content of courses should be organized around these strategies, aligning with societal needs, rather than relying on stressful, workaholic, and purely scientific curricula. Instead, agile curricula equipped with modern software tools (including artificial intelligence) and focused on professional skills should be designed.
Keywords: Idea and philosophy of the university, inflation in higher education, inclusive education, critical thinking skills, desire for lifelong learning, professional competence and proficiency, curriculum and educational programs.

Gravity, Life and Evolution

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Abstract

In this article, we explore the effects of gravity on the origin of the universe, the formation of the primary cosmic structures, the formation of the Milky Way galaxy and the solar system, the formation of the planet Earth, the origin of life on Earth, the evolution of living organisms and the evolution of complex human organs on the planet Earth.

Rethinking the Factors of Success in Mathematics: Misconceptions and Effective Strategies

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Abstract

Given the broad scope of mathematics education goals, improving students› academic performance and mathematical achievements at different levels is a serious concern.
Misleading and harmful beliefs in this regard, especially those related to the connections between intelligence and success in mathematics, create a significant educational barrier. Recognizing the various factors of success and applying appropriate educational strategies can help prevent this.
In this paper, while reviewing different theories that predict the factors of success in mathematics, we also

address suitable educational strategies to reduce the impact of misconceptions.

Keywords: Mathematics Education, Academic Success, Educational Misconceptions, Intelligence, Affective-Motivational Factors

Biosemiotics: A New Science in Biology?

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Abstract

Biosemiotics is a growing field that investigates semiotic processes in the living realm, addressing meaning, signification, communication, and habit formation in living systems, and the physicochemical conditions for sign action and interpretation. Scientific fields such as molecular biology, cognitive ethology, cognitive science, robotics, and neurobiology deal with information processes at various levels and, thus, provide knowledge about biosemiosis (sign action in living systems). Biosemiotics attempts to integrate these findings, so as tobuild a semiotic foundation for biology. In the development of biosemiotics as a research field, it is particularly important to build specific models of life processes, emphasizing their signifying nature, and, thus, helping to enrich and complement the biological sciences as standardly understood.

Keywords: Biosemiotics, Biology, Semiotics, Sign

Mathematics and Artificial Intelligence: A Symbiosis for a Smarter Future

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Abstract

Mathematics and artificial intelligence (AI) have forged a symbiotic relationship, driving some of the most groundbreaking advancements of our time. Mathematics provides the theoretical foundation for AI, equipping it with essential tools such as linear algebra, probability, and optimization to build complex algorithms. In turn, AI is transforming mathematics by addressing intricate problems that were once beyond human capabilities. AI-powered theorem proving, pattern recognition, and data analysis are revealing new insights and uncovering previously unknown mathematical structures. This mutual reinforcement has led to breakthroughs in fields like geometry, number theory, and combinatorics. Together, mathematics and AI are shaping a future defined by unprecedented innovation and intelligent technologies. This paper will explore how these two disciplines fuel each other›s growth, from AI›s reliance on mathematical models to its role in advancing mathematical discovery. As this collaboration deepens, mathematics and AI continue to push the boundaries of what is possible, driving a smarter and more innovative future.

Mathematical Modeling, a Bridge to the Digital Ecosystem & the World of Artificial Intelligence

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Abstract

In this paper, after a brief overview of diverse scientific advancements in the field of artificial intelligence (AI), the role of mathematical sciences in this domain is examined. Following a concise discussion of the contribution of mathematics to AI, the focus shifts to introducing the most fundamental aspect of this field. Mathematical modeling is presented as the gateway to the world of AI, accompanied by a few illustrative examples. These examples showcase specific challenges within the AI domain that are translated into the mathematical realm through modeling, solved, and then reintegrated into the AI ecosystem along with their solutions. The aim is to present examples that are tangible, innovative, and scientifically grounded. These examples are predominantly centered on robotics and geometry.

Citizen Science: An «Unidentified Name» for Iran's Scientific Community

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Abstract

Citizen science has been recognized in prestigious international scientific communities for many years, and various citizen science projects are being implemented in collaboration with the best and most well-known universities and citizen science associations. It has been ten years since the definition of Citizen Science was added to the Oxford English Dictionary. Now, citizen science has a place beyond scientific associations and conferences, and it gains its importance by finding its way into the curricula of students. Citizen science is the active cooperation and accompaniment of the general public with professional scientists in carrying out scientific research tasks and producing new knowledge. Thanks to advanced information and communication technologies, interested individuals, wherever there is an Internet connection, can collaborate in citizen science research from biological and medical sciences to social and human sciences, politics, and education. The participation of the general public – experts/non-experts – in citizen science can be categorized into four groups: 1) data collection projects, 2) data processing projects (categorization, transcription, interpretation), 3) curriculum-based projects, and 4) social science projects. The aim of this article is to introduce this Unidentified Name to the Iranian educated scientific and managing community.

Keywords: Citizen Science, learning, educational productivity, artificial intelligence, ethics

A Review of the Life and Works of Muhammad ibn Zakariyya al-Razi (865–925)
The Glory of Integrity, Elegance, and Sophistication
In Science, Medicine, and Medical Ethics

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Abstract

George Sarton, an incomparable historian of the history of science, called the second half of the third era of Razi, and he also says that Razi was the greatest physician of Iran and the Islamic world during the middle ages. Neuburger, in his work History of Medicine, writes that Razi was undoubtedly the greatest physician among the few physicians of the Islamic period who followed the path of Hippocrates and created impartial and unparalleled clinical assessments. According to Parviz Azkaei (in his valuable work entitled Hakim Razi), the era of Razi is the period of return or rebirth of ancient Iranian culture. This period, coinciding with the third and fourth centuries AH, was accompanied by the decline of the Abbasid Caliphate and the establishment of the Samanid and Daylami states and other dynasties, which itself paved the way for the growth and flourishing of science and knowledge in the period known as the Golden Age of Islamic civilization. Razi, like Abu Rayhan and Ibn Sina, played an unparalleled role in the flourishing of this era during this period under the protection of the new rulers. Razi›s precise medical insights and special treatment methods made his works a world-renowned medical authority for more than five centuries. Razi was the first to distinguish smallpox from measles; with this observation and research, one of Razi›s correct and fundamental diagnoses, in his treatise on smallpox and measles, he also discussed valuable measures to prevent the complications of these two diseases. In this category, he is known as an excellent observer and at the same time a critical collector of pioneering Greek, Syriac, and Arabic medical knowledge. In this article, we review the prolific life of Zakaria Razi, an unparalleled Iranian physician, philosopher, and chemist, and his very valuable works.

The Moral Philosophy of Abu Bakr Razi as a Life Guide for the Modern Individual

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Persian Translation by Ali Farazmand

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Abstract

Abu Bakr Muhammad ibn Zakariyya al-Razi, a prominent Iranian physician, philosopher, and chemist, had some original ideas about health psychology that can still be relied upon. In particular, in his philosophical treatises on ethics, he states that there is a close connection between mental

health and human moral competence. According to him, a person's physical and mental health depends on avoiding a life centered on pleasure, rational control of emotions and thoughts, the ability to critically examine oneself, and active struggle with deficiencies that distance him from a virtuous life. In fact, if a person allows his desires and instincts to dominate his mind instead of rational control, he will ultimately be unable to prevent the recurrence of mental illnesses within himself. This is where Razi's ideas about healing the soul and developing moral character can be put into practice as a kind of moral prescription for achieving a virtuous and happy life. According to Razi, who emphasizes the value of reason in all his thoughts on ethics, man can, by combining the power of reason with the power of will that God has given him, have a true understanding of meaning and purpose and can attain the basic principles of how to continue his worldly life. This knowledge can help him cope with the problems of life, overcome his fears/anxiety about his own death, and fight his fundamental weaknesses such as selfishness, stinginess, and greed, and thus achieve happiness in both worldly and hereafter. Although it is thought that the human weaknesses that Razi discusses may be limited to the conditions of his era, in fact, the weaknesses he discusses, because they are related to man›s material existence, cannot be confined to a specific time and place. Therefore, Razi›s treatises on the elevation of morality contain ideas that can guide modern man who is in the midst of his own sorrow and grief and show him how to correct his mistakes and find meaning in his life. In an effort to free oneself from desires and passions and to treat pains such as narcissism, self-harm, alienation from death, dissatisfaction, consumerism, aimlessness, alienation from one›s own existence and fellow human beings, loneliness, and the belief that everything can be controlled, Razi›s ideas in psychology seem to be very effective. This article examines Razi›s ideas on how to heal people materially and spiritually, and points out various topics such as liberation from sorrow, abandoning mistakes, coping with human weaknesses, not marginalizing death, approaching existence from the perspective of surrender, and thus achieving spiritual healing for humans, which can be the key to the vital struggles of the individual in the modern era. The main purpose of the article is to examine the potential contribution of the approach to issues that govern the pattern of human life today and how, from the perspective of Razi›s ideas, it can be beneficial in promoting morality and its possible benefits for modern life. Our conclusion is that resorting to Razi›s moral thoughts can be found effective in the following cases: (1) understanding the value of existence and guiding of others; (2) coping with anxiety/fear of death; (3) adopting protective measures against mental disorders that are themselves considered symptoms of modernity; (4) providing alternative solutions to find lost peace of mind and liberation from the sad view of life; (5) liberation from pain and sorrow, which are essential aspects of worldly life; (6) being under control of one›s own desires and passions; and (7) trusting and surrendering to God Almighty in times of despair.