

THE EFFECTIVENESS OF ARTIFICIAL INTELLIGENCE APPLICATIONS IN TEACHING ARABIC

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Abstract: Artificial Intelligence (AI) has recently gained significant prominence. It is a field dedicated to developing computer systems capable of operating with high efficiency comparable to that of humans, as machine operations simulate various human cognitive processes. Consequently, it has become an essential discipline across all fields of knowledge, with its applications and programs influencing numerous sectors—most notably education, and specifically the teaching of Arabic. In light of this, the present study—titled "The Effectiveness of Artificial Intelligence Applications in the Electronic Teaching of Arabic"—aims to examine key AI programs and their educational applications. It explores their impact on the educational process, as well as their contribution and effectiveness in teaching Arabic within the framework of digital and electronic education.

Keywords: Artificial Intelligence, Computer, Teaching, Arabic Language

Introduction:

Artificial Intelligence (AI) is considered one of the modern sciences that has recently become widespread and highly popular, thanks to the modern technologies it has introduced—technologies that have significantly impacted all scientific disciplines and fields. It represents one of the most important outcomes of the Fourth Industrial Revolution due to its diverse applications in military, industrial, and economic sectors (Majid, 2018, p. 3). Consequently, AI theory, technology, and its applications in medicine, education, and services have proliferated, making a major impact on various studies and research. It is a cognitive science that seeks to develop complex computer programs capable of performing difficult cognitive tasks (Ibn Dahman, 2015, p. 33)—tasks executed by machines and computing systems. Thus, the emergence of AI in the twentieth century marked a qualitative leap, enabling the creation of successful technological methods that have transformed our way of life (Whitby, 2008, p. 9).

The Concept of Artificial Intelligence

It is appropriate to address the concept and nature of Artificial Intelligence. It is a science concerned with simulating human intelligence and understanding its nature by creating computer programs capable of mimicking intelligent human behavior (Majid, 2018, p. 6). It is also defined as a science concerned with creating machines that perform actions perceived by humans as intelligent (Ibn Abd al-Nur, 2005, p. 7). It is an empirical, procedural science grounded in the use of computers—specifically digital systems with high computational capabilities and general-purpose utility—to execute various algorithms. These systems possess the ability to accept digital data as input for processing and to output digital data resulting from that processing (Mohamed Al-Arabi Ahmed, 2019, p. 25). Among the definitions proposed for this field are the following (Athamnia, 2019, p. 12):

- The automation of activities associated with human thinking, such as decision-making, problem-solving, and learning (Bellman, 1978).
- The art of creating machines capable of performing tasks that require human intelligence (Charniak and McDermott, 1985).
- The study of computational systems that enable processes such as perception, reasoning, and action (Winston, 1992).
- The study of how to enable computers to perform tasks currently done by humans—and to do them better (Rich and Knight, 1991).
- A branch of computer science concerned with the automation of human behavior (Luger and Stubblefield, 1993).

These definitions and concepts reveal that, while there are numerous definitions of artificial intelligence, they all converge on a single core essence: the automation of human behavior and enabling machines to perform tasks that humans do (thinking, remembering, knowing, storing, retrieving, etc.). As a comprehensive and concrete definition, we can state that artificial intelligence is a branch of computer science dedicated to creating and designing computer programs that simulate innate human intelligence, enabling them to... ..whereby the computer performs tasks—such as hearing, speaking, and movement—that would otherwise require

human thought and comprehension (Al-Sharqawi, 1996, p. 23).

Fields of application for artificial intelligence

The fields of this science are diverse; broadly, they include (Afifi, 2015, p. 25):

- Expert systems.
- Automated theorem proving.
- Natural language understanding.

- Robotics.
- Automated knowledge representation.
- Computer-based education and learning.
- Multimedia.

Defining the scope of this science is not simple; it has expanded to become a cognitive science influencing all disciplines—from the exact sciences to the humanities. This evolution, characterized by "artificial intelligence," has led to the emergence of two distinct theoretical approaches (Afifi, 2015, p. 24):

- A metaphorical/analogical approach: This focuses on the nature of human intelligence, attempting to model the machine after the human—or even to match or surpass human capabilities.
- A procedural/applied approach: This focuses on building expert systems that exhibit intelligent machine behavior, regardless of whether it resembles human intelligence.

Consequently, the concepts and trends within artificial intelligence theory have influenced numerous fields, including computer science, biology, psychology, mathematics, engineering, and linguistics. The following diagram illustrates this influence (Mousa & Bilal, 2019, p. 181):

- Computer Science
- Psychology
- Philosophy Sociology
- Neurobiology
- Artificial Intelligence
- Biology
- Linguistics
- Mathematics

Applications of Artificial Intelligence

The fields and applications of artificial intelligence are numerous; among them are (Khazaaleh, n.d.):

- It is applied to various devices and machines, enabling planning and problem analysis using logic.

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- Utilizing artificial intelligence in the industrial sector through robots capable of performing tasks typically carried out by humans.

- Developing software and computer technologies across various fields, such as engineering, education, commerce, medicine, and diverse investment sectors. Artificial intelligence has made significant inroads and is now utilized in the development of the following (Damrawi, n.d.):

- Computer applications for medical diagnosis in hospitals.
- Mechanisms for scientific research via the Internet.
- Mechanisms for stock trading systems.
- Intelligent-capable systems, such as driverless vehicles and drones.
- The development of software and computer technologies across various fields, including engineering, education, commerce, medicine, and diverse investment sectors.

Artificial Intelligence and its effectiveness in teaching Arabic (digital e-learning):

Scholars largely agree that the future of Arabic language instruction depends on keeping pace with modern challenges. These challenges are rooted in mastering the "power of knowledge"—understood in a modern sense and underpinned primarily by modern technologies, the information and electronics revolution, and telecommunications. There is a reciprocal relationship between language and computer engineering; computers are used to construct linguistic models and analyze their various branches. Numerous applications exist within Arabic language teaching software, such as computational morphology, computational syntax, and computational semantics. The importance of computers is also evident in the creation of educational dictionaries through:

- Automated character and word recognition.
- Storing content and organizing it according to the required system.
- Retrieving content (or parts thereof), modifying data, deleting unnecessary elements, and extracting specific segments from the material (Abu Haif, 2004, p. 93).

We can summarize the importance of computers in the successful teaching of Arabic as follows: The following points:

1 Ease and Convenience:

The computer serves as a fundamental tool and pillar for the Arabic language teacher to convey the subject matter quickly and easily. This fosters a genuine desire in the learner to engage with the language and encourages them to apply what they have acquired to their actual linguistic environment.

2 Effectiveness:

Effectiveness is realized through the core components of the educational process—the teacher, the learner, and the educational material—whether inside the classroom or outside it via this technological medium. It transforms the teacher's role from a mere lecturer into a facilitator and guide who manages the educational process through language. By utilizing the computer, the teacher guides learners, provides feedback on their acquisition of Arabic content, assesses their progress, and helps them overcome learning obstacles. This dynamic fosters competition and interaction among Arabic language learners.

3 Achieving Educational Objectives:

Since their introduction into the fields of education and Arabic language instruction, modern technologies have contributed significantly to achieving the educational objectives set by curriculum designers. These technologies enable learners to communicate in sound Arabic across various real-life situations, effectively applying the skills they have acquired in speaking, reading, and writing.

4 Speed of Execution:

This is a defining characteristic of our contemporary world—an attempt to leap across time and stay ahead of it through the constant speed necessitated by competition and the race toward development. Rapid education is, in itself, a manifestation of this prevailing pace. ...globally, given the capabilities technology offers to drastically reduce the time required to achieve ultimate learning objectives.

Thus, the computer holds immense importance in Arabic language pedagogy—extending well beyond the points already mentioned to offer further opportunities, such as exposure to the experiences and cultures of others.

Conclusion:

Based on the preceding discussion, this study concludes with a set of recommendations and proposals regarding Arabic language pedagogy in the context of artificial intelligence and technological/electronic advancements. Key among these are:

- The necessity of organizing training courses for teachers on the use of electronic software within the educational process.
- The need to integrate modern technologies—such as computers and electronic devices—into all educational institutions, keeping pace with curriculum evolution, particularly in Arabic language instruction.
- The need to conduct research into the difficulties and obstacles teachers face when utilizing technology in Arabic language pedagogy.

- The need to prioritize the practical application of multimedia and electronic tools—via computers—to develop Arabic language curricula and teaching methods across all educational levels.
- For technology to succeed as a fundamental tool in the educational process, it must be effectively mastered and optimally utilized.
- The need to focus on Arabic digital content and to establish specialized committees dedicated to enriching and validating such content for the e-learning sector.

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