The Effectiveness of using Artificial Intelligence Applications on Art Teaching

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Abstract

Artificial intelligence is part of the environmental communication system of digital technology, the development of information technologies and the transition to digital technology and communications have become among the reasons that led to the creation of an ecosystem consisting of digital technologies where digital transformation affects all fields of the arts, hence the problem of research in the use of artificial intelligence applications on the teaching of arts. Through these entrances, the concept of artificial intelligence and the various plastic capabilities of this modern technology were clarified and to identify the applications of artificial intelligence and its importance in the field of art in general and the field of art teaching in particular.

- Artificial intelligence applications help in the development of teaching methods and technical educational activities.
- Many recent studies have contributed to the enhancement of technological techniques used in the plastic arts.
- Through artificial intelligence applications, electronic technical platforms can be activated to enhance artistic creativity.
- It helped the techniques and applications of artificial intelligence in the creation of different styles of art.

Keywords: Artificial intelligence, teaching, digital technology.

1. Introduction

The use of artificial intelligence techniques in education in general and art education in particular is classified as the idea of purposeful artistic experimentation and the development of new standards for artistic design, and artificial intelligence applications allow the artistic and creative breakthrough of the learner

Artificial intelligence is one of the important fields that have attracted the attention of many scientists and researchers, as this field has witnessed continuous developments that have achieved important effects in the future of humanity, which has brought about transformations in daily life, including high-speed computers that can help in many fields and provide cognitive educational systems.

(Hoda Ibrahim, 2022, 147)

Artificial intelligence has also revolutionized education because of its ability to increase the efficiency of art teachers if used in a proper way because it has the ability to better understand information (Shaltout, 2023, 277).

It is the responsibility of researchers in the fields of arts to keep pace with technical development and research into the possibility of adopting artificial intelligence techniques for their multiple characteristics in machine learning based on data, artificial memory, logical deduction and the ability to deal with data very quickly.

The research discusses the diverse intellectual opinions on the use of artificial intelligence in art teaching for the possibility of producing art pieces by improving and developing the technologies used, providing new solutions, opening different horizons and ideas with the least effort and time, high quality and high accuracy.

Artificial intelligence is a real leap that a number of countries seek to achieve the highest breakthrough towards a better future in education and other fields, which contributed to the dissemination of artificial intelligence applications in various fields, as many international organizations such as UNESCO and UNICEF support the use of artificial intelligence in education

Search problem:

From the above, the research problem is clear in the following question:

How can artificial intelligence applications be used in art teaching?

Force Search:

The research assumes that:

Innovative artworks can be created based on the use of artificial intelligence applications

Research Objectives:

- Identify applications of artificial intelligence in the field of teaching fine arts

· Highlighting the role of artificial intelligence applications in developing contemporary trends in art teaching

· Producing innovative artworks through artificial intelligence applications

The importance of research:

The importance of the research can be summarized as follows:

· Directing the attention of those interested in plastic arts to the role of artificial intelligence applications in developing art teaching

· Finding new methods and methods in teaching that keep pace with the current era

· Seeking to create works of art in a new way that enriches outstanding creative performance

· Shedding light on the possibility of drawing, coloring and dealing with different materials through simple and three-dimensional programs

Search limits:

The search is limited to the following limits:

· **Objective limits:**

Artificial intelligence in terms of origin, concept, levels, applications

Works by artists who used artificial intelligence

The role of artificial intelligence applications in teaching arts

· Time limits: 2024 AD

2. Research Methodology:

· The research depends on the descriptive and analytical approach to the dimensions of the problem and its axes

Search terms:

· **Applications:**

Applications: (name)

Applications: Application collection

Apply, Apply, Apply, Dish Source

Application: A word whose origin is the noun (application) in the form of the feminine plural of Salem, its root (dish), its trunk (application) and its analysis (application + at) (Al-Hafiz Abi Al-Fayd, 2014)

Artificial Intelligence:

The ability of a machine or device to perform certain activities that require intelligence such as actual reasoning and self-repair

Intelligence: a word whose origin is the name (intelligence) in the form of a masculine singular and its root (intelligence) and its trunk (intelligence)

(Al-Hafiz Abu Bakr Al-Isfahani, 2003)

Artificial intelligence is a name given to a set of new methods and methods in computer programming that can be used to develop systems that simulate some elements of human intelligence and allow it to deductive operations that are represented in computer memory (Irene Attia, 2020, 604).

Teaching Art:

Teaching: (name)

Lesson Source

Lesson: (Verb)

He studied taught, taught, he is a teacher, and the effect is a teacher

He studied the book and the like: he taught it, read it and understood it to students and the like (Al-Hafiz Abi Al-Fayd, 2014)

Arts : (name)

Collecting art

Fine arts: all artistic creations that rise to perfection and beauty, and elevate imagination to creation and creativity such as poetry, music, painting, sculpture, decoration and construction

Art: Art collection

Plural: Afanin, Afnan and Arts

Art: The set of means used by man to arouse feelings and emotions, especially the emotion of beauty, such as photography, music and poetry

Art: A skill governed by taste, talent and combination: Arts

Expressive art: it is the one that depends on subjective impressions,

Art for art: a principle that the value of art is in itself,

Abstract art: which relies on abstract forms (Al-Hafiz Abu Bakr Al-Isfahani, 2003)

Teaching Art:

Art teaching is defined as all educational programs and curricula based on tangible or visual arts, and is taught by specialized teachers following a sequential approach based on certain standards, and the arts include several types and fields, as follows:

1. Visual arts: such as: painting, sculpture, pottery, and design work, which includes interior design, jewelry design, and clothing.

2. Performing arts: such as: dance, music, theater, etc.

3. Computer-based arts: photography, video, film, design and artificial intelligence (Art education, 2021))

Search Steps:

Theoretical Framework:

- The emergence of artificial intelligence
- The concept of artificial intelligence
- Levels of artificial intelligence
- Artificial Intelligence Applications
- The role of artificial intelligence in the development of art teaching
- Advantages and characteristics of artificial intelligence
- Analysis of a collection of paintings by artists using AI applications

The emergence of artificial intelligence:

Since the emergence of the industrial revolution in the 18th century, the world's attention began to turn to technology, to search for effective and easy means to help it enjoy life, and with the advent of the middle of the twentieth century, the world witnessed a fourth industrial revolution and the beginning of the emergence of artificial intelligence and its integration with the robot, which is increasingly accelerating, it has become an essential part of everything that is used in daily life and has a clear impact on the surrounding reality and on lifestyle and economic growth in all fields

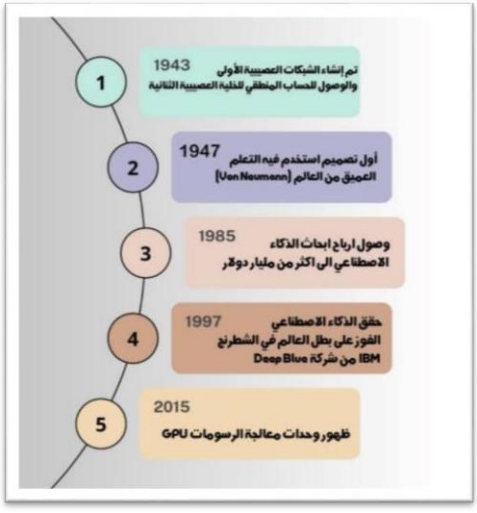
Over time and the development of techniques and methods of algorithms that have reached the improvement and interaction of many components until the neural network became inspired by the neural network model of the human mind, and the main goal of the developments of artificial intelligence technology was to work to enhance the mental performance of the human to the highest level of service that is in the interest of humans, and it is a watershed in human history, and the idea of artificial intelligence revolves around the integration of a third of the basic sciences of arithmetic, logic, and neuropsychology, and the main idea was In how to implement

Logical actions by simple components and neural networks

Artificial intelligence is based on computer science and advanced programming languages that work for the ability of the machine to learn, which simulate the ways the human mind works and

its mental abilities in making the right decisions through conclusion, thinking and prediction, and with the growth and development of artificial intelligence technology, it has become one of the most important technologies that overlap in many sectors and fields that help perform various tasks, and the most prominent areas are: Expert systems, letter recognition, games, robotics in its various tasks, data analysis and stock exchange, and then it is one of the most important technology that sweeps everything that surrounds us, and represents the reality that inevitably comes and artificial intelligence will be everywhere from driving a car, agriculture, industry, engineering, music, space, writing, composing, and drawing and will lead to a new phase of the technological process that will affect the lifestyle and social structure and build a sustainable future

(Abdullah Mousa, 2019)



The evolution of the emergence of artificial intelligence

The concept of artificial intelligence:

It is the science of making machines make things that require human intelligence in order to do them, and it is a branch of the computer concerned with the study and manufacture of computer systems that can accomplish work that requires human intelligence, as these systems are characterized by learning new concepts and tasks and can think and draw useful conclusions about the world in which we live.

It is defined as a machine or computer program that uses human intelligence to complete a task through planning, teaching, understanding, justification, problem solving and forecasting (Southgate,2019,17).)

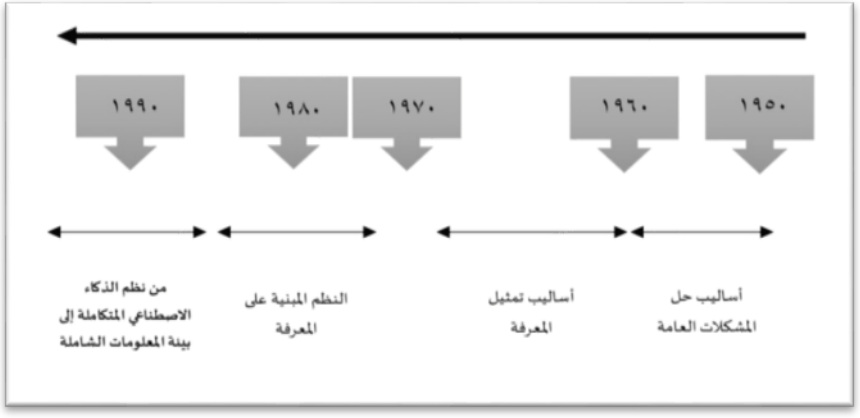
The term artificial intelligence consists of two words: the first artificial refers to something manufactured or unnatural, the second Intelligencemeans the ability to think or understand, then

artificial intelligence means the cognitive ability to learn and deal with the problem, that is, it takes from the human mind and how to learn humans as a basis for developing software and smart systems

The term artificial intelligence was coined by Stanford University Professor Emeritus John McCarthy in 1955 and defined by him as "the science and engineering of making intelligent machines." Much research works on programming machines to act in a clever way to mimic the human mind, such as playing chess, and nowadays machines are produced that can learn, at least like humans do. 2020)

Marvin Lee Minsky defined it as creating computer programs that engage in tasks that humans satisfactorily accomplish, requiring high mental processes such as memory regulation, cognitive learning, and critical thinking.

It is defined as a machine or computer program that uses human intelligence to complete a task through planning, learning, understanding, justifying, solving problems and anticipation (Southgate etal, 2019).)

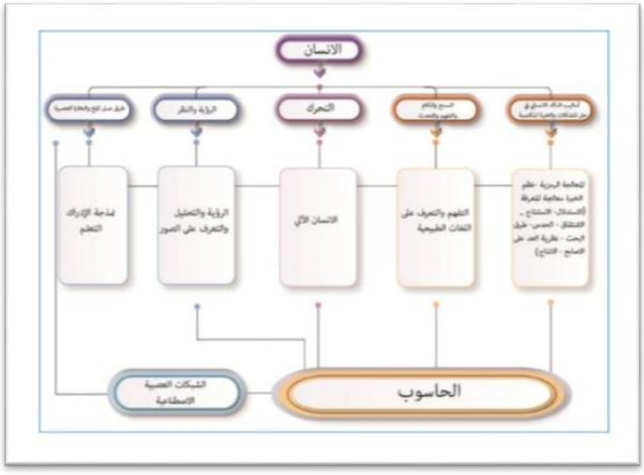


Stages of development of the concept of artificial intelligence

Human Intelligence:

It is one of the most important processes or activities carried out by the human mind is the ability and skill to find solutions to problems using various research methods to extract new information and knowledge that leads to the development of the level of intelligence

(Zainab Mohammed, 2023, 53)



The relationship between human intelligence and artificial intelligence

Levels of artificial intelligence:

Dr. Stefania Giannini, 2021 illustrates the levels of artificial intelligence in the following figure:

(Stefania Giannini, 2021)

Levels of artificial intelligence

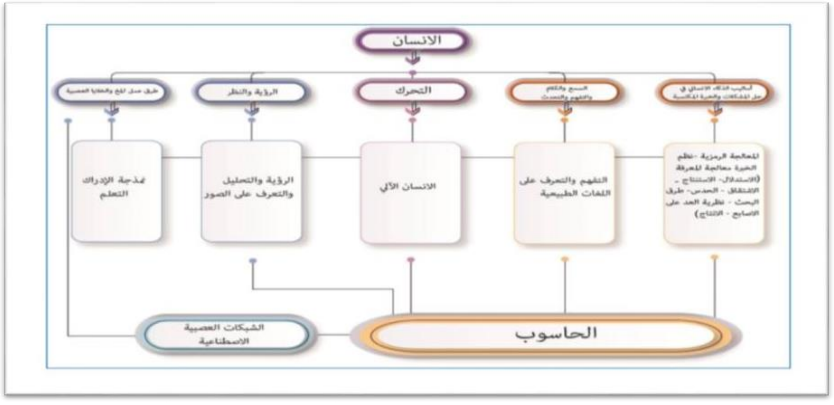
There are three basic components of artificial intelligence:

1. Knowledge base, which is a self-service electronic library that contains information required to perform tasks dedicated to the system and may include evidence of troubleshooting and other information that enables the system to interact with user inputs

2. Programmed procedures, which consist of deduction, extrapolation and deduction processes to simulate human intelligence and perform the required tasks

3. The user interface is to interact with the system (The effectiveness of digitization, 2023)

Artificial Intelligence Applications:



Artificial Intelligence Applications

The researchers found that there are a number of important and most common applications in **artificial intelligence:**

These include intelligent agent, chatbots, planning, human performance formulation, machine learning, vision applications, augmented reality, image recognition applications, learning systems, systems applications, game applications

Artificial Intelligence Applications

With the great interest in artificial intelligence, many different applications have emerged that do a high-speed technical treatment for a huge amount of data for a set of words and images that

describe what is going on in the artist's imagination, after which it provides a number of high-quality designs and technical proposals according to what has been entered by the user, so it is a revolution in the world of design and artistic creativity (Mohamed Abdel Hamid, 2023, 277)

Artificial intelligence applications that contribute to the teaching of arts:

Automatic Machine Learning :

It is one of the branches of artificial intelligence that is concerned with designing and developing technologies that allow computers to obtain the advantage of learning, and software applications become more accurate in predicting results without the need to program them explicitly. The art education teacher can feed the computer with inputs and data for lesson information, and the computer begins to predict the results and outputs and the teacher discusses them with the students.

Deep Learning:

It is a form of artificial intelligence and depends on a set of technologies such as: artificial neural networks that simulate neurons in the human body and artificial neural networks are inspired by the way the human brain works, and consist of several artificial neurons linked to each other, and the more they are, the deeper the network Deep learning relies on simulating neural networks in the human brain in order to understand different patterns and behaviors and information related to the lesson to be communicated to students

Generative Conflict Networks :

It is a technique of artificial intelligence techniques that are used in drawing paintings and can be used with students, as it is based on the use of a set of networks entered on the computer that depend on a matrix of random numbers and these generative networks in the creation of new images that are used in the composition of a painting and this technique was used by the artist Edmond de Bellamy.

Painting by Edmond de Bellamy, Artificial Intelligence

Generative Conflictive Networking Technology, 2018

There are many applications of artificial intelligence that contribute to the development and enhancement of art teaching, such as an application that transforms the imagination of human words into a work of art (Marwa El-Shorbagy, 2022) Midjourny

Through this application, it is possible to create groups of paintings that express the artist's imagination, and this application depends on converting text into a digital image, which is one of the deep construction models and will become prevalent in the future (Jonas oppenlaender, 2022 near)

There is also an application

Which enables the creation of everything that the artist imagines, and can create a three-dimensional image in a realistic way, illustration or cartoon, allowing artists to discover new ideas in a few seconds (Arts and Architecture, 2023, 65)

Through these applications, large collections of innovative paintings can be produced, which contributes to the effective teaching of art and the increase of artistic production.

The role of artificial intelligence in the development of art teaching:

Many studies have shown the importance of employing artificial intelligence applications in teaching arts and their effective role in creating new works of art in several ways:

1. Promoting innovation and creativity: Artificial intelligence can help students develop critical thinking, problem-solving and creativity skills by providing new tools and techniques that contribute to the implementation of new art forms.

2. Improving teaching efficiency: Artificial intelligence can help analyze student data and identify its strengths and weaknesses, which gives better results

3. Make art available to all: AI can share art through software and applications without the need for expensive art equipment (Irene Attia, 2020, 604)

Artificial intelligence applications can be used in art teaching through:

1. The use of three-dimensional drawing and design programs supported by artificial intelligence, where the student can create realistic and interactive artworks

2. Using virtual reality and augmented reality applications, where the student can practice art experience in new and interactive ways

3. There are many of the most common applications of artificial intelligence that can be used in the fields of arts, namely:

- Game Apps
- Expert Systems Applications
- Applications of vision by machine
- Voice recognition apps

- Human Performance Applications
- Augmented Reality Applications
- Smart Agent Applications
- Applications of Smart Learning Systems (Irene Attieh, 2020, 616)

Studies have proven that artificial intelligence applications have an effective role in the development of arts productivity through:

- Search
- Design
- Creating artistic educational content
- Writing articles and technical research
- Create technical tests
- Create technical presentations (Mohamed Shaltout, 2023)

There are many studies that have clarified the importance and role of artificial intelligence in the field of arts, including the study that indicated that the use of artificial intelligence in the design of cartoon characters provided designers with a style of presentation and the creation of complex good designs with accurate details and saves time, effort and modification and allows the designer to be creative and helps him to find solutions and provides them with advanced algorithms that help create multiple designs (Faten Farouk, 2022)

Some studies also indicated the possibility of connecting machines and producing programs for millions of works of art in one minute and dealt with digital technology systems and the extent of their reflection, different types of arts, and how to benefit from three-dimensional technologies, virtual reality, robotics and augmented reality in creating works of art characterized by imagination and innovation.(Ebtisam Saud, 2020)

Artificial intelligence has developed many techniques that contribute to the development of the arts through techniques that allow the transfer of the artist's style pattern to images that depend on taking advantage of the ability of neural networks to understand content and style and convert them into artistic images (Chengsi yaol, 2019).)

Advantages and characteristics of artificial intelligence:

Advantages of artificial intelligence: Researchers illustrate the advantages of artificial intelligence in the following figure

Advantages of Artificial Intelligence

1. The possibility of representing knowledge: It contains a set to represent the cognitive structures to form a knowledge base that contains as much information as possible about the problem to be found solutions

2. Using the experimental method: that is, its programming does not use a solution method for sequential steps, but chooses a good solution method while retaining it and the possibility of changing it

3. The ability to deal with missing information: You can program it with solutions even if the entire information is not available

4. Ability to learn: It is related to programming to generalize information and deduce similar and selective cases of information

5. Inference: Its programming is related to deriving solutions to a problem through its previous experiences in addition to the use of the laws of inference and logic (Abu Bakr Khawald, 2019)

Characteristics of artificial intelligence:

- Use intelligence to solve problems presented in the absence of complete information
- Ability to think and perceive
- Ability to acquire and apply knowledge
- Ability to learn and understand through computer experiments
- Ability to use old experiences and employ them in new situations
- Ability to use trial and error to explore different things
- Ability to respond quickly to situations

· Dealing with difficult and complex situations

· Ability to deal with ambiguous situations in the absence of information

· The ability to visualize, create, understand and perceive visual matters (Ahmed Habib, 2019)

Analysis of a group of paintings by artists who used artificial intelligence applications:

Artist Harold Cohen:

He is a British artist who designed a computer application called "Aaron" that can produce art forms independently of any human intervention and then developed the program with the aim of extracting symbols and abstract art forms and indeed the artist succeeded in creating black and white drawings and then produced colorful paintings after using brushes and dyes chosen by the program itself without the intervention of the artist But it was very primitive for Cohen and he later painted it with his own hand, and it was exhibited in international museums, including Tat in London.

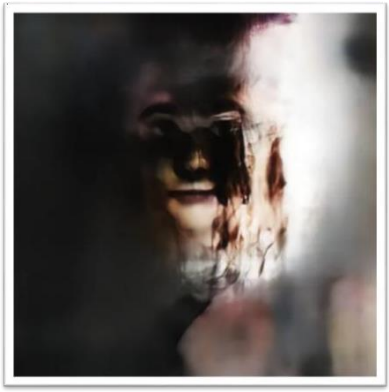
Sample paintings by Harold Cohen

Artist Mario Klingman :

He is a German artist famous for making paintings based on the use of neural networks and codes, where he produced a collection of paintings in 2016 and is considered a pioneer in the use of artificial intelligence techniques in learning the arts Mario Klingmann, a German computer scientist, created an artificial intelligence piece made entirely by computer. Amazing art depicts a series of distorted faces that form images on two separate screens, as a result of a computer algorithm. There is a lot of controversy about whether this piece can really be considered a product created by artificial intelligence 100 percent, as Klingman had to build the device himself and actually produced the palette of memories of passers-by

Neurological dysfunction of Mario Klingman:

In 2018, artist Mario Klingman began exploring a new technique called "neurological glitch" by manipulating GAN networks The artist is able to exchange, change or delete trained weights, managing the creation of a piece with semantic and histological glitches What's most interesting about this technique is that there are no photographs that are filtered or processed, so the entire collection of works is created from the ground up.



Neurological dysfunction painting by Mario Klingman

Memories of Passers-by by Mario Klingman

Artist Jesion Allen :

In the art competition in Colorado, United States in August 2022, artist Jesion Allen used a program based on artificial intelligence techniques to make his painting, which he called (Space Opera Theater), which won first place for digital art.

Allen believes that artificial intelligence, like the brush, is the creation of hundreds of paintings with artificial intelligence and chose this painting to participate in the art competition and joined the Department of Digital Art and Photography, and although the painting is like imagination mixed with reality with high accuracy, it was between supporters and opponents of the art of

artificial intelligence and this problem will be present on the ground, but the ever-evolving artificial intelligence techniques and its amazing techniques will be taken advantage of because they impose themselves strongly in the field of art (Al art is everywhere)

Space Opera Theatre painting by Jession Allen

From the above, it can be said that science and art are two types of production of human thought, they include a set of elements that can be achieved by a number of different intellectual processes and linked, they complement each other and do not divide from each other, art is the scientific application of scientific theories and may participate with science in expressing different facts, and science has affected its theories and development in art as it also benefited from trends and art schools, and notes in the modern era how art benefited From science such as: optics, lenses, and the study of molecules, and arts such as computer art, robot art, digital arts, nanotechnology and augmented reality have emerged (happy holiday, 2025)

Through this research, it is clear to us the important and effective role of artificial intelligence techniques in the development of art teaching and the modernization of artistic productivity with new and innovative works that simulate the technological development of the current era, which enriches the plastic arts and emphasizes the integration between science and art.

3. Results:

From the above we can conclude:

· The importance of artificial intelligence applications in the development of arts teaching, which leads to the quality of education

· Artificial intelligence contributes to creativity and innovation in the field of plastic arts

· Artificial intelligence applications help develop teaching methods and technical educational activities

· Many recent studies have contributed to the promotion of technological techniques used in plastic arts.

· Through artificial intelligence applications, electronic technical platforms can be activated to enhance artistic creativity

· It has helped artificial intelligence techniques and applications in the creation of different styles of art

· It allows the user experience of artificial intelligence applications the ability to spread and reach a large number of users

· A number of artificial intelligence applications have contributed to accelerating the pace of artistic production and the speed of the spread of high-quality artworks

4. Research Recommendations:

The researcher recommends the following:

· Holding specialized training courses in the applications of artificial intelligence in the fields of plastic arts

· Inclusion of artificial intelligence skills, concepts, programs and tools in art teaching courses

· Directing the attention of researchers to pay attention to research and in-depth in the fields of artificial intelligence

· Issuing periodicals that include new fields and applications that serve art teaching

· Using modern strategies based on artificial intelligence applications in the field of arts

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