The Impact of the Development of Stereoscopic Paper Arts in Animation Films

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Abstract: **Art appeared from the very beginnings of the existence of man on earth, where his tendency to express himself appeared through a number of drawings and statues, some of which were found, so these drawings had many connotations as a kind of appeal, or distress, or his need for immortality. Various civilizations have worked to develop and improve paper to serve different writing purposes, and the role of paper was not limited to notation and printing, but rather in some industries, and extended to many areas where it was used as a technology in animation Paper was invented around 105 AD in China. The Japanese first used paper during the sixth century, but the Japanese were the first to discover the possibilities associated with the use of paper as a medium of art. The modern use of the word "origami" is as an umbrella term for all folding practices, regardless of their culture. The original goal is to convert a flat sheet into the final solid shape through carving and folding techniques. Contemporary origami masters appeared in the twentieth and twenty-first centuries. I am considered the Grand Master of Origami, Akira Yoshizaw.**

Keywords: **(Stereoscopic paper, origami, folding paper, forming paper, moving stereoscopic, moving paper, kirigami).**

1. INTRODUCTION

With the passage of time, man has his own ways of expressing the phenomena surrounding him and his interaction with them, and as soon as man begins to control these phenomena, he can judge his ability through the experience through which he passed through drawings and lines; "He can impose more control over nature through that complex dialogue between himself and the components of nature The invention of paper was one of the most important achievements of mankind for the spread of science and the arts [1] ."

"Paper has been on top of writing tools for a very long time and has become the most important writing material for its ease of production, the multiplicity of its raw materials and its cheapness, and it is still so far even though humans have entered the era of digitalization.

And extended to many areas where it was used as a technique in animation, the concept of animation has changed throughout history as it is a process of creating the illusion of movement by quickly displaying a series of images that differ greatly from each other. We find that the changes in the artistic and technical form that took place through the production of types of modern animation [2].

The art of modern animation has witnessed multiple trends that included many experiences with the aim of expanding the scope of art to include all aspects of life and to transcend the boundaries between the different artistic fields, and the animation film became a field of experimentation and research, as the artist became more aware of contemporary cultural changes, and there is no doubt that scientific development Who meets the needs of the artist in the current era must influence the need of this artist to search for new methods in the field of animation.

Research problem:

The scarcity of paper craft animation films and how it was developed in the Arab 3D animation movie.

Research objectives:

- Study the origins and emergence of Paper Craft films, and their most important pioneers.

- Study the aesthetic values of Paper Craft (Paper Craft) films.

- Knowing the techniques and methods of implementing Paper Craft films.

- A different artistic study for some variable Paper Craft films from different studios.

- Making use of the study of paper holographic technique in the experimental film.

Hypotheses:

- To what extent did the material contribute to the realization of the idea of the three-dimensional paper arts movie?

- Do paper designs affect the aesthetics of the stereoscopic paper arts film?

- Is there an effect of modern technologies on the production of 3D paper arts films?

The importance of research: The importance of research lies in the study of:

- The scarcity of studying this topic through previous research may benefit researchers.

- The introduction of Arabic stereoscopic paper cartoons.

- Enriching the plastic and technical side of Paper Craft films.

Search limits:

- Temporal boundaries: from 1955 to the present day

- Spatial boundaries: East Asian countries, European countries, America.

2. RESEARCH METHODOLOGY

In this study, the researcher follows the historical and analytical method.

• The use of paper in plastic art:

Plastic art was known in the past as visual art, and it is one of the types of art that branches off into other artistic types, and this type focuses on perceived visual taste regardless of the different media used in the production process. Plastic art seeks a set of expressive goals, and gives the intellectual space to everyone who watches it In the twentieth century, an art appeared that played a prominent role in plastic art as a kind of abstract art, which is collage.

It is an art distinct from other arts as it depends on cutting and pasting several different materials together in one painting, and this art dates back to the country of China.

Collage, or the art of sticking scrapbooks, originated in China when paper was invented in about the second century B.C. However, the use of collage remained limited until the tenth century CE, when calligraphers in Japan began using a set of scraps of paper to write on the surface of lines of poetry. The birth and development of the modern art of collage was linked to the birth of a new wave in the arts called modernity [4].

In Europe, collage appeared in the Middle Ages during the thirteenth century AD, when Gothic cathedrals began using panels made of gilded tree leaves. And precious stones and some precious metals in religious paintings. In the nineteenth century AD, collage methods were also used among souvenir crafts enthusiasts.

The concept of collage is derived from the word collar, which was invented by Georges Braque and Pablo Picasso at the beginning of the twentieth century AD when collage became an important part of modern art [5].

The artist Pablo Picasso (Cubism) was the first to use the technique of collage in oil paintings, where he affixed a piece of tarpaulin with a chair on a piece of canvas for the painting "Arlkan" or "the still life" 1912, and the painting of a fruit plate with a violin 1912 [6] [Figure 1].

(Figure 1) Pablo Picasso, Fruit Plate with Violin, Collage, 49.5 x 64 cm 1912

• **Paper arts, their development and use in animation films:**

*Shadow play***:** Known as Shaykh al-Khayyal, Shadow of Imagination, Spectrum of Imagination, Khayal Al-Sattar and Al-Fiction, it is a popular art that moved to the Islamic world from China or India via Persia and was famous for the Mamluk era in particular.

This art is based on dolls of dried leather of contrasting colors and develops using paper, whose lengths range from thirty to fifty centimeters, and they are moved with a stick behind a curtain of white cloth highlighted by the light, which makes its shadow that stands out to the viewers, and it was the puppet engine, a professional artist, Known as (Mikhael) or (Character Engine), the puppet engine can make characters appear to walk, dance, fight, and jump [Figure 2].

Shadow fiction was one of the most important folk arts and a preferred method of entertainment. His dramas express social, economic, political and historical conditions in a simple comic manner. "[7] Shadow imagination has gained popularity in various cultures among children and adults in many countries around the world. More than 20 countries are known to have shadow fantasy show teams. It is considered an ancient tradition with a long history in Southeast Asia, especially in Indonesia, Malaysia, Thailand and Cambodia. This ancient art had folk traditions in China, India and Nepal.

(Figure 2) Shadow Performer, Yogyakarta, Indonesia, by Ki Mantip Sudharson Puppet Engine

Cutout animation **:** It is a form of stop-motion animation using flat figures, props, and backgrounds cut out of materials such as paper, card, hardwood, or even photographs. The props will be cut out and used as toys to stop the movement.

"The earliest known animated films in the world were a cut out animation, produced in Argentina by" Quirino Cristiani "and he is the first person to create cartoons using only scraps of cardboard. He obtained a patent for these cut out paper characters in 1916 to achieve His films, as well as the oldest surviving feature of animation in the world [8] [Figure 3].

(Figure 3) his satirical character El Peludo, by Christiani-1956

Lotte Reiniger is a German artist, director and animated filmmaker who inspired Europeans' interest in the traditional Asian art of shadow fiction.

Director Lott Reuniger continued to use her beautiful style in the 1960s to show some of her fictional films. Her works contained well-known titles such as (Sleeping Beauty), (Puss in Boots), (The Frog Prince) and (The Magic Horse) [9]

Her only feature fictional work (The Adventures of Prince Ahmed) took three years to complete and was released in 1926 and is often considered the first feature-length animated film in cinematic history. This film features using Reiniger's shadow animation technique, in which the cutouts are manipulated Made of cardboard and thin sheets of lead that are placed under the camera. " This technique is somewhat similar to shadow puppets, although its technique included moving the frames one by one and not manipulating the movement [10] [Figure 4].


(Figure 4) The Adventures of Prince Ahmed - Lotte Reiniger-1926

Origami (the art of folding paper): Since paper degrades with age, it is difficult to come up with a specific timeline for inventing origami. That paper was invented around 105 AD in China. The Japanese used paper for the first time during the sixth century. , But the Japanese were the first to discover the possibilities associated with the use of paper as a medium of art. As there are other cultures engaging in different forms of paper folding, so Japanese paper makers have improved the quality of paper further, and their paper quality is adequate for folding.

The word "paper" began as a term derived from papyrus, a name from the ancient materials made from reeds in ancient Egypt and dates back to the third millennium B.C. Where the earliest known example of "paper folding" was an ancient Egyptian map, drawn on papyrus and folded in Rectangular shapes such as the modern roadmap [Figure 5].

The map * was considered the first known example of folding. According to origami historian David Lester, the map was mentioned by Professors Koryo Miur and Masamori Sakamaki, from the University of Tokyo, at a meeting of the International Cartography Association in 1980 as an example of an early folding map. "[11]
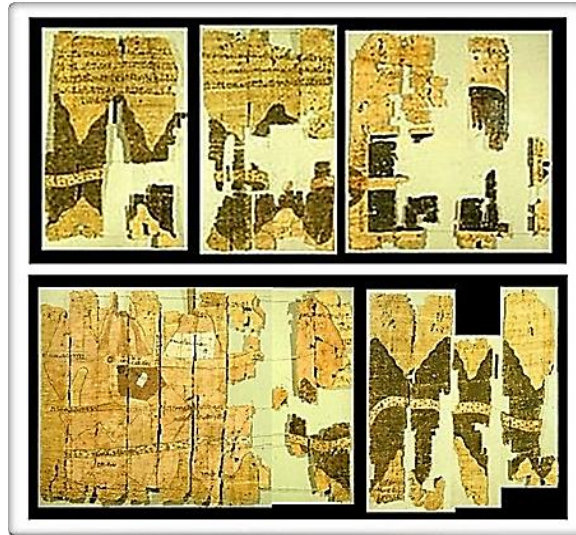
(Figure 5) The first ancient Egyptian map.”The Turin Papyrus Map, Deir al-Madina, Thebes

As this art originated in Japan in the seventeenth century AD, and the goal of this art is to convert flat paper through folding techniques into three-dimensional bodies that have a specific shape that usually resembles an object or a solid, as the things produced from paper folding in this era were Hats, boats, roses and butterflies that were used at Japanese weddings.

"So origami is the art of folding paper, and it is also called origami. It consists of (Ori), meaning (folding), and (Gami-kami) meaning paper, is an art closely related to Japanese culture. The modern use of the word" origami "is as a comprehensive term For all folding practices, regardless of its culture, the original goal is to convert a flat sheet into the final solid shape through carving and folding techniques. Origami practitioners do not encourage the use of cutting and pasting or making any marks on paper in general. Origami designers often use the Japanese word kirigami. To denote a design that uses shearing, although shearing is a feature of Chinese paper industries.

A small number of basic origami folds can be combined in different ways to create intricate designs. The crane is one of the most popular forms of Japanese paper-folding (see Figure 6).

In general, these forms begin with a square paper, whose sides can be of different colors, shapes, and patterns. Japanese origami, which has been practiced since the Edo period (1603-1867), is considered less strict in these laws, sometimes using cutting paper or beginning with paper that is not square. [12].

(Figure 6) Crane

- **The modern era of origami :**

“The art of origami has changed and evolved over the centuries, and it has spent a period of time as a novelty with some different elements that were popular.” There is another type of early origami called (Kusadama) and this is an introduction to standard origami in the modern era. And a modern version of art is "mathematical origami". Origami has expanded to

include advanced mathematical theories, so pioneers of origami mathematics such as "John Maikawa" and "Peter Engel" designed complex homogeneous patterns with a foldable mathematical basis, which emphasized the puzzles aspect of origami.

Two men are credited with bringing origami into the modern era and transforming it from a simple fad into an art form with many variations. It greatly increased in a group of folds and possibilities, these two men are "Miguel Onamono" from Spain and "Akira Yoshizawa" from Japan "[13].

Akira Yoshizawa is considered one of the founders of modern origami in the 1930s, he developed a system of folding patterns using a combination of symbols, arrows, and diagrams.By the 1950s, these patterns were widely published and available, which contributed to the diffusion and standardization of origami. Worldwide "[14].

"Yoshizawa published books with completely new models starting from the early 1950s and new techniques and ideas, combining the mechanics of the paper-folding craft with the artistic beauty of sculpture, as he was able to create more than 50 thousand new art forms. See [Figure 7]. Samuel Randlett of America developed the standard set of symbols for paper shapes that are still used today, thanks to which anyone can know how to read the instructions for folding any origami form regardless of its language "[15].

(Figure 7) Some examples of Akira Yoshizawa's work

- **Enter origami animation :**

The visual image has always had a lot of influence on the audience, and with the development of technology and the addition of new tools to this field, many types of animation have appeared, as it depends on a consecutive display of two or three-dimensional images at a certain speed, and by the introduction of many new technologies, methods and different graphics, origami entered With 3D paper figures to the world of animation ... and this is an example from the works .

Mixing the Colors film , produced in 2011, 4: 5 minutes, directed by Michael Knight), produced by Opaque Nature.

It is a musical animation movie that tells the story of a messy, multi-colored man and a group of his animal friends of varying height and construction. The forest begins to collapse and they move into the valley [Figure 8].

(Figure 8): Mixing the Colors, Michael Knight, 2011

3. RESULTS

1- The study demonstrated the importance of using new techniques in stereoscopic animation to gain Skills for animation department students.

2- It should be noted that there are no paper model films produced in the Arab world.

3- Paper stereoscopic films require specific paper that is characterized by flexibility and is not available in Egypt.

4- Knowledge of new technologies is an incentive for the artist to create and present new, non-repetitive works to the viewer.

❖ **Recommendations: In light of previous findings, the researcher recommends:**

1- Interest in modern paper technologies in stereoscopic animation films.

2- Inserting paper engineering into animation courses.

3- Conducting workshops and training programs for animation students to benefit from character design techniques Origami.

4- Encouraging intellectual and technical creativity through experimenting with modern technological media and integrating them with original technologies.

5- Working to increase artistic awareness and aesthetic appreciation, by teaching aesthetics in Arab educational institutions in their educational stages.

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