Pakistan Journal of Life and Social Sciences

www.pjlss.edu.pk

RESEARCH ARTICLE

Infographic Design Skills among Students of the Institute of Fine Arts

Dhuha Taha Baqi Al-Assadi[1*], Assistant Professor Doctor Zahoor Jabbar Al-Atwani[2]

[1, 2] Faculty of Basic Education, Mustansiriya University, Baghdad, Iraq

ARTICLE INFO	ABSTRACT
	The current research aims to identifyInfographic design skills among students of the Institute of Fine ArtsWhere the research problem lies in confrontingStudents of the Institute of Fine Arts face multiple challenges in acquiring and refining these skills, including a lack of targeted and appropriate training, and a lack of specialized educational resourcesWhile highlighting the importance of research inImproving the quality of education and enhancing students' competence in this vital fieldAndThis research helps identify gaps in current educational curricula and provides recommendations for developing them in line with the requirements of the digital age and the modern labor marketThe researcher also reached a set of the following conclusions and recommendations: 1.Infographic design skills for the benefit of the experimental group and can be used as an effective tool in learning and teaching to help the learner improve and develop skill performance. 2. There is a tracetoInfographic design skills for the benefit of the experimental group. 3. Including topics and skills related to modern technologies that prepare students for the labor market and their practice by students within the skills of infographic design. 4. Infographic design skills in developing marketing skills for students of the Institute of Fine Arts in the subject of advertising art.

INTRODUCTION

Research problem

Infographic design skills are considered essential skills in the digital information age, as they have become the primary tool for communicating information in attractive and effective visual ways. However, students at the Institute of Fine Arts face multiple challenges in acquiring and refining these skills, including a lack of targeted and appropriate training, a lack of specialized educational resources, in addition to constant changes in design techniques and tools.

From here emerges the research problem in trying to answer the following questions:

1. What are the basic infographic design skills that students of the Institute of Fine Arts should possess?

2. How does the current educational curriculum affect the development of these skills in students?

3. What challenges do students face in learning and designing infographics?

4. To what extent are the acquired skills compatible with the requirements of the modern labor market in the fields of design and digital media?

5. What are the educational strategies and methods that can improve the level of students' infographic design skills?

Research importance

The importance of research on "Infographic design skills among students at the Institute of Fine Arts" is evident in improving the quality of education and enhancing students' competence in this vital field. This research helps identify gaps in current educational curricula and provides recommendations for developing them in line with the requirements of the digital age and the modern labor market. It also contributes to raising the level of students' practical skills, which increases their readiness and competitiveness in the labor market. In addition, research provides effective teaching strategies and tools that can improve the quality of education and increase student engagement and academic outcomes. Through this research, the opportunities of graduates of the Institute of Fine Arts to obtain prestigious jobs in the fields of design and media can be enhanced, which contributes to achieving their professional and social excellence.

Research objective

The current research aims to identifyInfographic design skills among students of the Institute of Fine Arts.

Research limits

The current research is limited by the following limits:

1. Objectivity border: Infographic design skills among students of the Institute of Fine Arts
2. Time limits: The current study is scheduled for the 2023-2024 academic year
3. Spatial boundaries: Institute of Fine Arts / Baghdad Education Directorate / Al-KarThe third one/ Iraq.
4. Human Limits: Students of the Institute of Fine Arts / Fourth Stage - Department of Print Design / Morning Study.

Define terms

He knew her: (2012Mark miciklsa)

It is the visualization of data or ideas to convey complex information to the audience in a way that can be received faster and easier to understand. (3, 2012Mark miciklsa)

While he knew her: (2013,Krum):

"The greater graphic design that combines data displays, illustrations, text, and images into a single format that tells a complete story,"p34, 2013, Krum)

While Al-Omari (2015) defined it:

They are visual representations to present data, information, or knowledge, and aim to present complex information in a clear manner, and have the ability to improve perception by employing graphics to enhance the ability of the individual's visual system to recognize patterns and trends (Al-Omari, 2015).

As defined by (Hussein Abdel Basset, 2015):

It is visual representations for presenting data, information, or knowledge. It aims to present complex information in a quick and clear manner, and has the ability to improve perception by employing

graphics to enhance the ability of the individual's visual system to recognize patterns and trends. (Hussein Abdel Basset, 2015)

Define it (Shaltout 2016):

It is a term given to the art of transforming complex data, information, and concepts into interesting and enjoyable visual elements that are clearly easy to understand and assimilate (Shaltout, 2019, 3).

A THEORETICAL FRAMEWORK AND PREVIOUS STUDIES

The first axis: A theoretical framework

Skills

In the arena of educational scientific research, developments in skills are a fundamental focus worthy of attention and reflection, as the focus is on enhancing and developing a variety of abilities and skills. We find that the current era is witnessing a surge in creativity and intelligence, and therefore those who have the necessary skills and abilities are considered the ideal candidate to excel and compete in the future. Since modern technologies require new skills, we must continue to develop ourselves and constantly update our skills to keep pace with this constant development.

Skills vary between individuals based on several factors, including age and experience, with young children having different skills than adults. Methods of acquiring skills also vary between different levels of education, as the skills of primary school students differ from those of university students. In addition, the acquisition of skills does not depend on a specific certificate or educational level, which highlights the importance of providing a comprehensive and personalized education that meets the individual's needs and aspirations. Skills are characterized by the fact that they require continuous effort and continuous training to develop, and they include personal, social, mental and physical abilities, which contributes to the development of an educated society qualified to meet the challenges of the times efficiently and effectively.

In recent years, studies have increased on the importance of learning and developing skills in all fields, as they play a decisive role in achieving learning goals. Al-Marei and Al-Hila (2009) point out that the increasing importance of skills has been observed in most areas of knowledge, as these skills enable us to achieve effective learning through the use of information collection and analysis skills. They also emphasize that a prominent example of the importance of skills is that they remain with us for a long time, while information and knowledge may be forgotten. As scientific knowledge continues to increase in complexity and development, focusing on skills development has become more necessary than ever (Marai and Al-Hila, 2009, p. 215; Rashid et al., 2023)

Skill performance

Skilled performance expresses an individual's ability to carry out tasks and functions efficiently and accurately. This performance requires a comprehensive set of knowledge and skills based on basic concepts and principles. The skill includes several aspects, including the mental aspect, which involves understanding the subject or situation deeply, the sensory aspect, which involves the individual focusing and absorbing information accurately, and the emotional aspect, which expresses the individual's enthusiasm and enthusiasm while performing the task. These emotional factors, such as enthusiasm, are considered an essential component of the quality of skill performance. (Matlas, 1997, p. 31)

Skilled performance represents the ability to carry out tasks accurately and effectively, and includes a group of concepts such as innovation, mastery, ingenuity, mastery, and experience. These skills constitute behaviors that must be built gradually to achieve excellent performance. Performance is

considered a fundamental pillar in the embodiment of skill, as it is understood as the active completion of tasks that can be monitored and measured. The level of performance depends on the individual's mastery of the skill, so successful performance requires good knowledge and understanding, along with the correct attitudes that guide his behavior. This strong performance embodies a basic condition for achieving the skill efficiently and accurately, as (Al-Titi, 2001, p. 165) points out.

Ahmed (2002) highlights the importance of skills:
- Making the learner active in the learning process, indicating that performing the skill contributes to collecting data, revealing relationships, forming concepts, and solving problems.
- Practical skills are suitable for all learners, whether slow or gifted, as each individual progresses at their own pace, boosting their self-esteem.
- Skills make learners feel fun in the educational process and eliminate the boring spirit that may accompany theoretical learning.
- It contributes to the development of desirable skills, such as teamwork skills, organization, and cooperation with others, which leads to the acquisition of greater deductive abilities. (Ahmed, 2002, p. 618)

Skills characteristics
- It is diverse, and includes all physical aspects, such as performance skills, and non-physical aspects, such as interaction skills in life situations.
- It differs from one society to another, depending on the differences in societies and needs.
- It depends on the nature of the reciprocal relationship between the individual and society, and the degree of influence of each on the other.
- It targets the individual's mature interaction with life, and the development of ways of living life.
- It is a development that combines knowledge and action as much as efficiency.
- You need repeated training, until it becomes closer to the habit.
- Acquiring it at an early age is better; Because this helps the learner master the skill.
- They differ depending on the age of the learner, as the skills of a young person differ from an adult's, and teaching the skill to primary age is not the same methods that university students are trained to use..
- Its acquisition is not linked to a specific certificate or specific educational level.

From these characteristics, it is noted that skills are a broad and comprehensive field that can target all age groups and educational stages. They are also absolute in scope and level and are not specific to a specific educational level or specific field of skills.(USF, Iman Ahmed. 11 am, 2020)

Design skills

It is an essential part of artistic work, and design skills are represented in several aspects, based on Morsi's study (2015). These skills include:

- Determine the design goal.
- Define the design problem.
- Collect and define design elements and vocabulary.
- Taking into account artistic and design values.
- Final output.

Forms of skill performance

Abu Al-Rub (1990) classified the types of skill performance, which are::

- Discernment: refers to the ability to recognize something in action, and understand it well.
- Recall: Expresses the ability to recall what needs to be done and correctly understand why.
- Expression: relates to the ability to describe work clearly and in detail.
- Problem Solving: Refers to the ability to determine how to carry out the required work in an efficient and timely manner.
- Manual operation or processing: expresses the ability to perform work practically and using appropriate tools (Abu Al-Rub, 1990, p. 75)

Students acquire technical skills through several axes:

- Gradual improvement in design processes, as students advance from the stage of imitation and simulation to the stage of artistic creativity.
- Accuracy in work and final output, which is evident in the level of their technical performance and their ability to directly reach the idea and purpose of the design without random confusion..
- Economy in time, as the time required for the design process increases with lack of experience and decreases with experience (Suleiman, 2014, p. 255).

Therefore, technical design skills represent a methodology for applying creative thinking and solving complex problems, and students must understand design vocabulary and principles and apply them practically. To ensure this, the researcher took into account, during the application of the study, all aspects of learning the performance skills of design, including the sensory and functional skills of infographic designs. .

There are several important aspects of skill in general. Some prevailing beliefs focus only on practical performance, without considering other aspects that affect the quality of that skill. These aspects include:

- The cognitive aspect: It lies in the ability to acquire the knowledge and information necessary to implement the skill efficiently. This aspect requires attention to theoretical learning and the knowledge necessary to understand the basics of the skill to be acquired.
- The communication aspect: which determines the extent to which a person is able to communicate with the skill and direct it effectively. This aspect includes the ability to identify a genuine interest and desire to develop the skill along with the ability to communicate the skill effectively.Smith.p67 (2018).)

Factors affecting design

 Several studies, including the study of Ali (2009), the study of Sharab (2010), and the study of Hegazy (2015), indicated that artistic design and its production are affected by the following factors::

1. Materials and performance skills related to design: These studies indicate that the quality of materials used in design, in addition to the technical skills and abilities of the designer, play an important role in the success of the design process..
2. The function of the artwork produced by the designer: This means that the nature and purpose of the artwork produced by the designer greatly affects the design process and how it is produced..
3. Design theme: It indicates that the nature and subject of the design plays a fundamental role in directing and influencing the design process, as the designer must understand well the topic he is working on and the message he wants to convey through the design..

Infographic

For an infographic it is considered An important tool to clarify concepts and information in a simplified and easy-to-understand manner, and allows learners to better understand complex topics. Infographics contribute to enhancing the learning process and stimulating critical thinking, as they can shed light on the relationships and trends between ideas in a visual and attractive way. Through this innovative method, learners can acquire new skills and move to the stage of analysis and creative thinking.

Through infographics, they have an enjoyable learning experience where they can explore the information in more detailIn addition, infographics contribute to attracting students' attention and motivating them to participate in the educational process And understand them more easily, which is important to enhance students' interaction with academic materials and enhance their level of interest and participation in the classroom.

It can be said that infographics are not just a means of clarifying information, but rather a powerful educational tool that enhances critical thinking and contributes to enhancing the learning experience for students. (Abdul Latif, 2016, p. 45)

The effective design of the educational message based on infographics contributes to attracting learners' attention to the main points of the topic. This involves using audio, written or pictorial cues to focus attention on important aspects. The design is based on appropriate visual displays to enhance understanding of the topic and make it more illustrative and attractive to students (Khamis, 2003, 15).

Shaltout stated that infographics is a term used to describe the art of transforming complex data, information and concepts into interesting and enjoyable visual elements. This art allows information to be clearly understood and assimilated, as visual displays are based on clear objectives. This method is characterized by presenting complex information smoothly, easily and clearly. The word "infographic" is an abbreviation of the term "pictorial information", and refers to a type of image that combines data and graphic design. Visual teaching and information (Shaltut, 2016: 107).

The origins and history of infographics:

Infographic technology may seem like a modern phenomenon, but the truth is that man has used graphic information for thousands of years, and that it has achieved increasing growth in conjunction with the growth of the Internet and the spread of its use. Graphic design is as old as man, and we can realize this through the drawings and sculptures that have reached us that date back to The prehistoric period, where its artistic beginning was based only on a spontaneous conflict, and the ancient Egyptians used these diagrams to tell stories of work, life, religion and history on the walls in hieroglyphics about 7,500 years BC.Dr,Most often, their motive is the result of the ambiguity that haunts human thinking in that period regarding the phenomena of nature, so it is as if they were religious rituals, magical signs, and statues in the form of symbols or gods to sanctify and worship them, and to protect them from the evils that surround them from natural phenomena and predatory animals, and the greatest evidence is However, the design is as old as man, as are the archaeological discoveries of the Lascaux Caves*[1](Al-Arabi, 2008,7).

In 1626 AD, Christoph Schenz published a book entitled,Rosa ursine sive sol" in which he reveals his research related to the sun's cycle. The infographic appeared in this book through illustrations that illustrate the patterns of the sun's rotation.. (Christoph,(Scheiner, 1626

The origins of the infographic come from the pioneers of visual data visualization, including the Scottish engineer William Playfair. He was the first to develop and publish several different types of graphs, most notably the line graph and the bar graph. The publication of these graphs dates back to

---

.* Located in the southwest of France, it is a complex series of caves that contain many drawings of animals on their walls. These drawings are estimated to be 16,000 years old.

the year 1786 AD in his book The Atlas of Commerce and Politics, which included: More than 40 diagrams displaying many economic and political issues that occurred during the eighteenth century.(2005 lan spence)

Despite William Playfair's many activities, the achievement for which he is best known is his innovation in displaying quantitative data via graphs. He believed that drawing could simplify numbers and present them more easily For understanding, which enables the reader to compare numbers to each other and understand their different dimensions. He is credited with introducing the pie chart of the scene, having been introduced in his book Statistical Prayers, published in London in 1801. Despite the passage

The evolution of infographics from the Stone Age to the end of the second millennium in the following points:

- The first examples of infographics date back to the Stone Age 30,000 BC, when humans began drawing pictures of animals and writing inscriptions on the walls of caves in southern France.
- Clear examples of infographics appear in hieroglyphic writing from 3000 BC, where graphic symbols (icons) were used to denote objects in ancient hieroglyphic writing..
- The emergence of writing in Mesopotamia on clay tablets (cuneiform language), where it was engraved on the clay with a thin pen, then dried with fire or the sun..
- From the beginning of the eighth century AD to the thirteenth century, Muslims invented the use of drawings to illustrate their inventions and theories.
- Medieval philosopher Nicolle d'Orsemme (1350 AD) invented one of the first charts to explain how to measure a moving object.
- In 1510 AD, Leonardo da Vinci combined instructions with illustrations to create a comprehensive guide to human anatomy.

DavidHe has written a series of books on visualization, quantitative data visualization, and infographics. He began his journey with information graphics in 1975 at the University of Preston, where he studied statistical graphics with John Tukey. He also organized workshops on the subject of graphs and charts from 1993 until 2012. Edward has a unique perspective on data visualization, striving to represent data accurately and with ease of understanding, making him a tremendous contributor to the field of information graphics.

Philosophical and theoretical foundationsFor infoKRavik

Info art can be highlightedKRAVIK is a tool used in the educational field based on the philosophical foundations on which it can be basedSuch asInfo relationshipKLearn about the physiology of the human brain. Research on vision and the ways in which the eye is used to process information have provided compelling justifications for the use of infoKRavik in intersecting daily communications. Scientists at the Massachusetts Institute of Technology discovered that vision is the largest part of brain physiology, with about 50% of brain power directed directly or indirectly towards visual function. These results confirm the feeling that the brain's processing of pictorial information (infographics) is less complex than its processing of raw texts, to the point that the brain deals with images at once with text in a linear, sequential manner..(Abdel Basset, 2015, 65)

One of the main reasons for speeding up the processing of image information in the brain compared to textual data is that different parts of the brain are stimulated simultaneously, which facilitates the process of assimilation and memory.,Many studies show that learners remember and deal with information better, and retain it for a longer period, if the texts are accompanied by drawings or illustrative pictures.H .(Evas, Fiore, & Oser, 2002, 456)(Shaltut,2016,28)

See the current studyThe way infographics are presented visually to display information has a significant and effective impact on the ability to retain and understand that information for a long

time, in addition to the speed of its absorption and understanding by the mind.The following figure illustrates these philosophical foundations

The theoretical foundations of infoKRavik

There are two types of infoKFixed and mobile Ravik supported by behavioral theories and approaches thatIts principles indicate that content should be divided into a successive series of topics, sequences, or... Educational units, then dividing each sequence or unit into a small educational step within it, which is represented in the display of main and sub-headings, texts explaining the information, as well as pictures, drawings, and both fixed or animated arrows in both static and animated infographic styles.. (Thursday, 2013, 13)

According to cognitive load theory CLT cognitive load theory: This phenomenon occurs because using graphics with text reduces cognitive load, which is the mental effort that the learner expends in the learning process and thus learners can focus more on the content rather than trying to understand the way the content is presented (Sweller, 1994). ,301) A positive approach that reduces load is to design activities and educational materials that match visual information, such as pictures and graphics, with textual content in order to reduce the effort that learners expend in comprehending the material..(Quiroga, 2004,3)

Information processing theory divides content into small steps, such as images or text, to facilitate understanding, while cognitive load theory emphasizes dividing information into small units called "cans," which can be numbers, words, or pictures. Short-term memory can only hold 5 to 9 units..(Khamis, 2013, p. 14).

Visual information is considered more effective in communication, as infographics use the sense of sight to understand the content, which makes learning meaningful. Studies show that vision consumes half of the brain's resources, and text messages with images improve information retention by 65% compared to 10% when reading text alone. Visual imaging increases humans' ability to quickly perceive and understand patterns (Krum, 2013, p. 12). Fathi (2016) believes that infographics improve perception and retention of information in long-term memory (Fathi, 2016, p. 227).

2/binary coding theory,Dual code theory

Which he developedAllan Paivio in 1971, suggests that information is stored in long-term memory in two simultaneous forms: visual and verbal. According to this theory, both visual and verbal modes have an independent cognitive subsystem in the brain, with its own functions in encoding and retrieving information. The theory is based on the assumption that these two systems work in sync, allowing information to be quickly converted between images and words and vice versa.(Khamis, 16, 2015)

3/AFor constructivism theoryconstructivist theory

In learning, it focuses on presenting educational content to learners in the form of small, simplified units, where learners organize these units and discover the relationships between them. According to Jerome Bruner (2001), learning occurs when these units are presented, and learners interact with them to build their own knowledge. Through this theory, preference is given to using infographics as one of the learning tools, as it can help present information in a simple, simplified and visual manner that facilitates the process of understanding and organizing it by learners.

4/Pre-attentional processing theorypre-Attentive processing theory Ly

It suggests that our visual system is capable of absorbing and analyzing the distinct characteristics of information with high speed and accuracy before we are explicitly aware of it. Visual characteristics

such as colours, shapes, movement and texture are part of this system. When we encounter a set of symbols or visual elements, the visual system analyzes these elements at low levels of perception without the need for focused attention.

For example, when looking at an image containing a group of blue circles with a red circle in the center, the red color of the central circle is quickly and easily perceived without much mental effort. Infographics rely on this theory in order to design and encode data in a way that makes it easy to understand and quickly absorbed by recipients.. This theory gives great importance to the use of distinctive visual characteristics in infographic design and data presentation, because it facilitates the process of understanding the information and reduces the effort required for that.(2008.7,Fekete)

Areas of use of infographics

Infographics have become the focus of increasing interest in the recent period, as they are used in several areas of daily life. Some areas of its use

- Adapting infographics to be part of websites, including journalistic websites, such as "Arabic Infographics" (Hassan, 2019).
- Infographics and data journalismThe use of infographics in electronic journalism, citizen journalism, and in social media platforms such as Facebook and Twitter to disseminate news leads to attracting a new generation of readers (Belaid, 2020).
- Infographics and educationProviding infographics as an effective tool in education. Based on the VARK model of learning styles, infographics can be designed to meet the needs of different learning styles (Davidson), 2014, p. 36.).
- Visual style(Visual): Designing infographics in an attractive visual way that includes graphs and pictures to illustrate concepts.
- auditory style(Auditory): Using audio recordings or video clips with text in infographics to clarify information.
- Reading/writing style(Read/Write): Include written texts and information in a simple and clear manner in the infographics.
- Motor style(Kinesthetic): Using interactive activities or explanatory videos in infographics to experience concepts practically (Davidson, 2014, p. 36).
- Infographics and e-marketingIn the era of intense competition and increased volume of information, e-marketing uses infographics as an attractive tool to attract attention and communicate the product message effectively. Infographics facilitate information analysis and decision-making for consumers, and enhance their understanding of the benefits and advantages quickly and easily.,I used a companyNintendo used infographics in marketing its products, such as the Switch device (Hassan, 2019, pp. 2-3).
- Infographics and health:Infographics play an important role in promoting health awareness through the use of awareness cards and illustrative images to guide patients with medical instructions in an easy and effective manner. This approach makes information easier for people with limited reading abilities to understand and promotes awareness of health concepts through illustrations and pictures.
- Infographics and geography:Infographics are an influential tool in the field of geography to simplify information and make it clearer and more understandable. Infographics use pictures and graphs to display geographical data in an innovative and attractive way, and show complex geographical phenomena such as population dispersal in a simplified and clear manner, climate change, longitudes and latitudes. It is also used to explain basic concepts and dangerous phenomena such as natural disasters. In general, infographics contribute to increasing environmental and geographical awareness among the public (Hassan, Soha, 2019,p 61).

- Infographics in the field of engineering facilitate the clarification of geometric shapes and decorations in a simple and simplified manner, making them understandable and convenient for use. The visual display of shapes and designs allows individuals to easily choose the appropriate shapes according to their needs and preferences (Kanval et al., 2024; Kutz, p67, 2018).
- Infographics and advertising form a powerful combination in the world of modern marketing and communications, where infographics are used to simplify complex information and make it attractive in advertising. The goal is to attract the attention of the audience and convey the message quickly and effectively, by creating graphs and explanatory charts that express the information in an attractive visual way. Infographics help make the information more interactive and interesting, which increases the chances of the advertising campaign being successful and achieving marketing goals effectively (Smiciklas, 2012 Jarrah et al., 2022; Wardat et al., 2021).

The importance of infographic design

TIt lies in its ability to organize and present educational information effectively. Al-Hila (1998), Darwaza (2000), Al-Qadi (2005), and Azmi (2014) have pointed out the importance of organizing the presentation of educational information. These researchers were based on studies of students' memory and how they process information. Many educators, such as Oziel, Bruner, Gagné, and Norman, have built their organizational models based on these studies..

Infographics can contribute to the development of school educational materials and educational programs, as the designer and educational subject expert can prepare good textbooks and educational programs, allowing information to be expressed clearly, logically, and in a way capable of persuasiveness. Organizing the presentation of information helps reduce time, save effort, improve the quality of learning, and contribute to its continuity.

The main purpose of infographics is the visual representation of information, and they are used to tell stories, convey ideas, and explore issues. Infographics are widely used today because there is greater understanding of specific topics or issues when expressed through graphics and images.. Ferreira (2014:23)

Infographic design goals

In 1927, Fred Bernard stated that a picture is worth a thousand words. He was working in the field of advertising and wanted to promote this concept by replacing words in advertisements with pictures. Bernard published an advertisement saying, "A picture is worth ten thousand words," and explained that this concept goes back to an ancient Chinese wisdom, with the aim of making people take it seriously (Attiya, p. 31, 2008; Jam at el., 2018; Tashtoush et al., 2023).

Studies show that images remain in memory much longer than words, making them more effective in the learning and remembering process. When we remember a situation, we often remember the visual details more clearly than the verbal expressions used during that situation. Studies confirm that visual images with high appeal and astonishment remain in memory for long periods. It is possible for an individual to forget a book he read twenty years ago, but he will not forget a visual scene or an image that expresses a certain idea. These distinctive characteristics of images are considered one of the most important factors that contribute to the learning and remembering process (Abdel Majeed, p. 56, 2011 Gningue et al., 2022; Tashtoush et al., 2022).

The second axis: previous studies

The effect of using the infographic technique on the achievement of physics among fourth-year scientific students and developing their visual thinking	the address	T

Content	Field	No.
2023	Year of completion	
Nayef, Aina Hamza	researcherH	
Identifying the effect of using infographic technology on the achievement of physics among fourth-year scientific students	Research objective	
The research sample is (69) female students, (35) experimental female students and (34) control female students Fourth year scientific students Governmental schools/Karkh Secondary Education/Baghdad Governorate	Community and research sample	1
Achievement test	Search tool	
programspss for data processing and analysis.	Statistical methods	
There are no statistically significant differences at the level (0.05) between the average scores of the students in the experimental and control group	Most important results	
Using infographics in teaching a curriculum course according to the theory of cognitive load And its impact on developing the achievement of university students with hearing disabilities	the address	T
2021	Year of completion	
Rashwan, Fatima Al-Zahraa, Kamal Rashwan	researcherH	
Determine the appropriate educational design for static infographic technology according to cognitive load theory	Research objective	
Sample of (11) students with hearing disabilities in the third year / Department of Art Education College of Specific Education/South Valley University	Community and research sample	2
Achievement test	Search tool	
programspss V20) (For data processing and analysis.	Statistical methods	
There are statistically significant differences between the average scores of the research group in the two applications (pre-post) of the achievement test in favor of the post-test.	Most important results	
Levels of intensity of visual cues in static infographics across the web and their impact on developing some educational design skills among student teachers in the Kingdom of Saudi Arabia.	the address	
2018	Year of completion	
Allam, Islam Jaber Ahmed	researcher	3
Addressing the shortcomings in students' low level of educational design skills	Research objective	
College of Education, Al Baha University, Kingdom of Saudi Arabia Fifth level students, College of Education (22) students, two groups: control (10) and experimental (12) students	Community and research sample	
Achievement test	Search tool	
programspss11) (For data processing and analysis. One-way analysis of variance method	Statistical methods	
There are statistically significant differences between the average scores of students in the research groups in the achievement test for educational design skills	Most important results	

RESEARCH METHODOLOGY AND PROCEDURES

Research methodology

Since the current research aims to Recognition Infographic design skills among students of the Institute of Fine Arts. The researcher relied on the experimental approach in the current study because it suits the goal of the research and its hypotheses, as this approach is distinguished by its superiority over other approaches in the degree of confidence that can be available in interpreting the effect of relationships between variables, especially causal relationships that are difficult to study without Experimentation (Daoud and Abdel Rahman, 1990, p. 247).

Experimental design

Experimental design is the first step carried out by the researcher. It is an essential step in scientific research, as it helps ensure the accuracy and integrity of the results. The success of the experimental study depends on choosing the appropriate design that allows the data to be analyzed accurately and effectively. Therefore, choosing the experimental design requires careful study of the research requirements. The goals to be achieved, including potential variables and controls. This helps in determining causal relationships between variables and correctly directing conclusions (Odeh, 1998, p. 250).)

To achieve the goal of the research, the researcher adopted an experimental design with two control and experimental groups with pre- and post-tests. The reason for choosing this type of experimental design is to control the paths of the experiment, by adopting infographic design skills, as well as the control group and applying it to students of the Institute of Fine Arts/fourth stage. ,It is compatible with research procedures in achieving its goalsAs shown in Table (1).

The researcher used this type of experimental design for the following reasons:

aTo know the extent of development in infographic design skills in the post-test, which is measured by the skill performance evaluation form for students of the Institute of Arts.

The research community(Population of research)

Research community: The current research population includes students of the Institute of Fine ArtsMorning study in Iraq for the academic year (2023-2024). The number of students is (251) distributed among the Design Department, fourth stage, in all governorates of Iraq, with the exception of the Kurdistan region, as shown in Table No.1).

Table No. (1) shows the numbers of the research community.			
Design department fourth	Institute	Directorate General To raise	T
15	Boys arts	Baghdad Karkh first	1-
25	Boys arts	Baghdad, Karkh, third	2-
18	Boys arts	Najaf	3-
17	Boys arts	Al-Qadisiyah	4-
11	Boys arts	Basra	5-
14	Benin country arts	Salahaddin	6-
15	Boys Arts Fallujah	Anbar	7-
25	Boys arts	Wasit	8-
18	Boys arts	Diyala	9-
45	Boys arts	Nineveh	10-
30	Boys arts	Kirkuk	11-
18	Boys arts	Dhi Qar	12-
247 students		the total	

The research sample

1- The basic research sample

It is part of the community on which the study is conducted and which the researcher chooses to conduct his study on according to special rules in order to correctly represent the community (Daoud and Abdel Rahman, 1990, p. 67), and in order to choose the research sample based on the components of the experimental design that was chosen with the intention of providing internal safety. For this design, the researcher purposefully selected the 25 students from the Institute of Fine Arts, Baghdad, Al-Karkh III, Department of Design, in the subject of media art, as they gained cognitive skills through the courses they studied. The researcher followed the following:

The researcher intentionally chose the Institute of Fine Arts/Al-Karkh III (due to the precise specialization of the Design Department, which includes the subject of advertising art for the fourth grade) to conduct the experiment, and the experiment sample, 13 in number, was randomly selected by lottery, Classroom A, as the experimental group to study the skills of designing infographics and the hall. Study (B), which numbered 12, to be the control group and taught in the usual way. The researcher excluded the failing students from Group (A), so that their number became (11) students. As for Group (B), none of them were excluded because there was no failure, so that their total number became (23 students) for both. The two halls.

Schedule (2) Distribution of sample members

Number of sample members	Excluded students	Teaching style	the group	Total number of students	Division	grade design
11	2	Infographic design skills	Experimental	13	a	Fourth students, department
12	zero	The usual method (discussion and presentation)	Female officer	12	B	
23	2			25	the total	

2_ Exploratory sample

A- An exploratory sample to identify and identify the research problem

The researcher conducted an exploratory questionnaire to identify and identify the research problem. Her questionnaire targeted (10) professors of the Design Department at the Institute of Fine Arts. The results revealed a weakness in the traditional methods used in teaching, which calls for consideration of improving them and adopting more modern and effective methods. This indicates that This conclusion indicates the necessity of reconsidering the approved teaching strategies, and adopting an educational approach that focuses on interaction and innovation, and employs technology effectively to enhance the learning experience. This aims to enable students to develop their skills and achieve outstanding performance in the field of design, which enhances the status of the institute and qualifies graduates to keep pace with the aspirations of students. The changing labor market.

B- A sample of clarity of instructions

  ⁱ⁻ **Experiment with clarity of instructions and understanding of statements to test the cognitive skills of infographic design**

  For the purpose of identifying the clarity of the paragraphs of the cognitive test and the clarity of its instructions, which consists of (48) items, and for the purpose of identifying the average response time, the researcher applied the cognitive test to a sample of the exploratory

experiment of (100) students who were randomly selected from the research community. It was found that all individuals The sample clearly understands the cognitive test items and its instructions, and that the average time to answer it is ( ) minutes. The researcher calculated the average time through the following equation:

Average response time = $\dfrac{\text{Learner time 3 + Learner time 2 + Learner time 1}}{\text{Sample number}}$

B- Test the clarity of instructions and understand phrases to test the skills of infographic design

For the purpose of identifying the clarity of the paragraphs of the skill performance test, as well as for the purpose of identifying the clarity of its instructions among the members of the exploratory experiment, which consisted of (20) students. After completing the application of the tests, it became clear to the researcher that all the paragraphs of the skill tests and their instructions were clear to the entire sample of the exploratory experiment. The researcher calculated the average time of Through the above equation.

3- Statistical analysis sample: One of the requirements for experimental research is to have a statistical analysis sample that will help the researcher determine many of its requirements, including examining the research tools, (cognitive and skills testing). Therefore, a sample of (100) was approved.[*]A student and the research tools were applied to them in order to know the difficulty factors and distinguish incorrect paragraphs and alternatives

Search tools

First - Cognitive test: The researcher prepared an objective achievement test (multiple choice).

Because this type of test is considered the best type of objective test because it can be used to evaluate multiple types of skills and abilities (Al-Kubaisi and Al-Dahri, 2000, p. 176), the researcher has developed (30) multiple-choice items, as shown in Appendix (5):

To prepare the achievement test, the researcher adopted the following steps:

A- Determine the academic subject

It is the first step in constructing achievement tests and has been previously determined within the impact of experimental procedures.

An educational brochure was prepared as the content of the Advertising Art subject by the researcher, which included the most important vocabulary of the second semester, as approved by the sectoral committee, and by adopting these vocabulary, the researcher prepared the educational content, relying on the standards of building the content, hierarchical organization, grading from easy to difficult, and from simple to complex, and then the researcher presented Educational booklet for a number of experts and specialists (attached)number 7) to express their opinion in what they saw as appropriate and correct for teaching students, and some topics were deleted and modified according to their opinions, and thus the booklet gained the quality of apparent honesty.

B- Formulating educational objectives(FORMULATION OF EDUCATIONAL GOALS)

Educational objectives are considered the basic pillar that sheds light on students' performance and are formulated in the form of precise educational statements that can be observed and measured (Attiya, 2013, p. 53). Identifying these objectives is crucial in the course of current research, as they play a vital role in designing teaching plans directed towards developing and improving students'

---

[*]The students of the Design Department, fourth stage, approved the morning study for the statistical analysis sample (Nineveh, Wasit, Kirkuk)

performance in the field of art education. In setting these goals, the researcher relied on scientific methodologies approved by the Iraqi Ministry of Education, the Curriculum Directorate, the Art Education and Educational Arts Teacher's Guide, and previous studies, and reviewing the standards for formulating educational goals in accordance with the requirements of current research, which gave them the clarity and comprehensiveness required for all aspects of the educational process.

Below are the educational objectives formulated by the researcher for the teaching plansThe researcher formulated (6) clear and comprehensive general educational objectives for all aspects, as shown in the table (3).

Schedule (3)
Clarifies the educational objectives specified in the teaching plans

Educational goal	Teaching plans
Providing students with the concept of advertising, its objectives and its importance	The first lecturer
Introducing students to the most important principles of design and visual image	PainHSecond damage
Introducing students to the principles and foundations of infographic designs	The third lecture
Providing students with the principles of the logo and how to design it)	Fourth lecture
Providing students with the principles and foundations of commercial advertising	Fifth lecture
Providing students with folder design skills using infographics	Sixth lecture

The researcher also formulated behavioral objectives according to the above-mentioned educational objectives and educational material that were collected and presented to experts and specialists.

C-Formulating behavioral goals:

To achieve this step was formulatedThe researcher formulated 48 goals distributed according to the topics of the Advertising Art subject for students of the Institute of Fine Arts, as follows: 22 cognitive goals (basic knowledge - learning for the sake of learning), 20 skill goals (application - unification), and 6 emotional goals (human dimensions - care). (48) behavioral objectives were formulated

Determine the test items

The researcher determined the number of items for the post-achievement test at (30) items, and extracted the number of items for each level from the total test items in light of its percentage weight in the test map. The number of items was determined for each lecture and for the six levels (basic knowledge - application - unification - human dimensions - care). – Learning for the sake of learning)

Validity of the test

The test is valid when it is characterized by measuring the characteristic or phenomenon for which it was developed (Al-Dahri and Al-Kubaisi, 2000, p. 53). Two types of validity were used, which are:

A- Apparent honesty:-

The researcher presented the test items in their initial form to a number of arbitrators with experience and specialization in art education, methods of teaching art education, measurement and

evaluation, asking them to express their opinions regarding the validity of the items and their representation of each of the specific cognitive levels, thus achieving apparent validity, Appendix (5).

B-Content veracity

To achieve this type of honesty, the researcher developed the test items in a way that covers the content and according to the specific objectives. The researcher also verified this by, and the researcher presented the test items in their preliminary form to a number of experienced and specialized arbitrators, and obtained an agreement rate of 90%. In light of what The test has previously been considered faithful in its representation of the content and objectives that it measures. Thus, the validity of the content has been achieved and the test is ready to be applied to the exploratory sample to measure the reliability of the test, the difficulty factor of the items, and the power of their discrimination.

Test instructions: The researcher put the following instructions
   A. **Answer instructions:**

- Write your name and branch in the space provided on the answer sheet.

- You have a test that consists of a number of paragraphs, all of which you must answer without leaving any of them out.

   B. **Correction instructions:**

One point was assigned to the paragraph whose answer was correct, and zero to the paragraph whose answer was incorrect. A paragraph that was left out or had more than one answer was treated as an incorrect paragraph.

Applying the test to the exploratory sample

The test was applied to a sample size of (20) students who studied the subject, randomly selected from the research community and similar to the basic sample in the current research. The researcher aimed for this procedure to ensure the clarity of the test positions and paragraphs. After the test was distributed to the students of the exploratory sample, they were asked to express Their observations on any paragraph of the test showed that the test instructions and paragraphs were mostly clear and understood by all students. The time for the first student to finish answering was recorded and was (22) minutes and the time for the last student to finish was (34) minutes. After calculating the average time, it was found that The appropriate time to complete the test is (28) minutes. The purpose of this was to determine the time for applying the test

Analysis of test items

Finding the difficulty factor

The purpose of calculating paragraph difficulty is to select paragraphs with appropriate difficulty and delete paragraphs that are too easy and too difficult (Al-Zubaie et al., 1981, p. 77). The degree of difficulty is explained by the fact that the higher its percentage indicates the ease of the paragraph, and if it is low, it indicates its difficulty. The difficulty of the paragraph was found for each paragraph. The test items are based on the equation, which is close to (24% - 79%) (Appendix 5). This is a good indicator of the validity of the cognitive achievement test items, as Bloom confirms.(Bloom) "Tests are considered good if the difficulty levels of their items range between (20%-80%)" (Bloom, 1983, p. 107)

Finding the power of discrimination

The power of discrimination means the ability of the item to distinguish between students in the upper category and students in the lower category in the proportion measured by the test (Samara

et al., 1989, pp. 106-107). To find the power of discrimination, the papers were arranged after correcting them in descending order from the highest score to the lowest score, and the number of papers was (70). paper, and after that, the researcher took a percentage of (27%) from the upper and lower categories, which numbered (19) students for each upper and lower group, and the researcher took the criterion of (30%) or more as a criterion for distinguishing the paragraphs, and Ebel pointed out(Ebel) in this regard indicated that "test items are considered good if their discriminating power is 30% or more" (Ebel, 1972, p. 406) and the table (4) explains that.

schedule (4)

Difficulty coefficients and discriminatory powers of cognitive test items

Discriminatory power	Difficulty factor	Ease factor	Number of correct answers for both categories	Correct answers for the lower group	The correct answers for the upper group	Paragraph number
0.56	0.55	0,45	23	10	13	1
0.49	0.46	0,54	24	13	11	2
0.55	0.53	0,47	23	14	9	3
0.52	0.49	0,51	21	11	10	4
0.50	0.48	0,52	18	7	11	5
0.48	0.53	0,47	24	11	13	6
0.57	0.51	0,49	28	14	14	7
0.53	0.53	0,47	23	12	11	8
0.47	0.48	0,52	17	9	8	9
0.47	0.53	0,47	22	10	12	10
0.50	0.54	0,46	21	11	10	11
0.46	0.51	0,49	27	14	13	12
0.46	0.50	0,5	20	11	9	13
0.51	0.53	0,47	17	9	8	14
0.53	0.53	0,47	27	14	13	15
0.45	0.54	0,46	25	11	14	16
0.51	0.52	0,48	16	7	9	17
0.58	0.53	0,47	21	12	7	18
0.49	0.51	0,49	19	9	10	19
0.45	0.54	0,46	27	14	13	20
0.42	0.53	0,47	20	9	11	21
0.50	0.57	0,43	20	12	8	22
0.51	0.53	0,47	16	9	7	23

0.44	0.54	0,46	26	14	12	24
0.55	0.55	0,45	26	12	14	25
0.48	0.53	0,47	24	14	10	26
0.41	0.48	0,52	26	12	14	27
0.49	0.46	0,54	27	14	13	28
0.53	0.45	0,55	19	9	10	29
0.57	0.51	0,49	18	6	12	30

Effectiveness of wrong alternatives

When the test is of the multiple choice type, the wrong alternatives are supposed to be attractive to ensure that they fulfill the role assigned to them in distracting the attention of students who do not know the correct answer, and not relying on chance (Imtanios, 1997: 10). A good alternative is the one that attracts a number The number of students in the upper group is greater than the number of students in the lower group. Conversely, it is considered ineffective and should be deleted (Awda, 1993: 125). The alternative is more effective the more its value is negative.

After the researcher conducted the necessary statistical operations for this, it appeared to him that the incorrect alternatives to the items of the post-cognitive achievement test had attracted a larger number of students in the upper group than students in the lower group, so it was decided to keep them all without deleting or modifying and table (5) explains that.

Schedule (5)
The effectiveness of incorrect alternatives to cognitive test items

Effectiveness of alternatives				Alternatives				the group	Paragraph
Dr	C	B	a	Dr	C	B	a		
		√		13	0	1	2	Supreme	1.
				10	2	1	2	The world	
	√			3	0	11	1	Supreme	2.
				0	0	13	2	The world	
			√	9	3	1	2	Supreme	3.
				14	0	1	0	The world	
		√		10	2	1	2	Supreme	4.
				11	1	1	2	The world	
	√			11	2	1	1	Supreme	5.
				7	3	2	3	The world	
		√		13	1	0	1	Supreme	6.
				11	1	1	2	The world	
			√	14	0	0	1	Supreme	7
				14	0	1	0	The world	
			√	11	2	1	1	Supreme	7.
				12	1	1	1	The world	
	√			2	2	8	3	Supreme	8.
				3	2	9	1	The world	
		√		13	0	1	2	Supreme	9.
				10	2	1	2	The world	
			√	3	0	11	1	Supreme	10.
				0	0	13	2	The world	
√				9	3	1	2	Supreme	11.

								The world	
				14	0	1	0	The world	
	√			10	2	1	2	Supreme	12.
				11	1	1	2	The world	
√				11	2	1	1	Supreme	13.
				7	3	2	3	The world	
			√	13	1	0	1	Supreme	14.
				11	1	1	2	The world	
√				14	0	0	1	Supreme	15.
				14	0	1	0	The world	
	√			11	2	1	1	Supreme	16.
				12	1	1	1	The world	
			√	2	2	8	3	Supreme	17.
				3	2	9	1	The world	
	√			13	0	1	2	Supreme	18.
				10	2	1	2	The world	
		√		3	0	11	1	Supreme	19.
				0	0	13	2	The world	
			√	9	3	1	2	Supreme	20.
				14	0	1	0	The world	
√				10	2	1	2	Supreme	21.
				11	1	1	2	The world	
	√			11	2	1	1	Supreme	22.
				7	3	2	3	The world	
			√	13	1	0	1	Supreme	23.
				11	1	1	2	The world	
		√		14	0	0	1	Supreme	24.
				14	0	1	0	The world	
√				11	2	1	1	Supreme	25.
				12	1	1	1	The world	
	√			2	2	8	3	Supreme	26.
				3	2	9	1	The world	
√				14	0	1	0	Supreme	27.
				10	2	1	2	The world	
			√	11	1	1	2	Supreme	28.
				11	2	1	1	The world	
		√		14	0	1	0	Supreme	29.
				10	2	1	2	The world	
		√		2	2	8	3	Supreme	30
				3	2	9	1	The world	

Test stability

The researcher extracted the reliability of the cognitive achievement test for the subject of methods of teaching art education in two ways:

1- The Richard Richard method (20): The researcher applied this method to calculate the reliability of the cognitive achievement test on a random sample of (30) students who were randomly selected from the research community. After completing the application and using the above equation, it was found that the reliability coefficient was (90%) and when the coefficient was squared To find out the joint interpretation factor, it turned out to be (81%), which is greater than (50%), and thus this is considered a reliable reliability factor (Odeh, 1984, p. 54).

2- Test and retest method: The researcher applied the cognitive achievement test to the same reliability sample above, which was (30) students, and after a period of two weeks had passed, he reapplied the test again, and the scores for the two applications were calculated, and the reliability value was extracted using the Pearson correlation coefficient, as the value reached (84). %) When the reliability coefficient calculated in this way was squared, it turned out to be (70%), which is greater than the value (50%), and thus the reliability coefficient is considered reliable (Odeh, 1985, p. 54).

Second: Skills test

Since the current research revolves around developing infographic design skills, which consist of two aspects: the cognitive aspect, which was measured by the cognitive achievement test, and the other aspect is the skills, which requires sample members to implement lessons in these skills designed according to the infographic design skills, so a skills test was designed. It consists of (4) questions that cover all teaching plans, as the student implements the infographic design skills required of him, represented by (...............) according to the question format specified in the test, and this is measured. Through the skill performance evaluation form in implementing teaching requirements that was prepared to measure the student's performance of these various skills.

Validity of the performance evaluation form:

Honesty is one of the basic features of any measurement tool because it gives an indication of the validity of this tool in measuring the goals for which it was developed. In addition, the validity of the test gives confidence to the researcher in measuring the phenomenon that the tool was prepared to measure with as few errors as possible.

The researcher presented a first questionnaireYIt is open to identify the most prominent skills in infographic design. Then, the skills in this form were presented to a group of experts in the specializations of (art education, theatre, measurement, evaluation, and teaching methods). In light of their opinions, scientific observations, and suggestions for deleting or amending the form's paragraphs, this form was corrected and returned to them again. To determine the extent of its validity in measuring what it was designed to measure. The process of conducting face validity that the researcher followed in determining the validity of this tool for measurement is one of the positive indicators in determining the validity of the tool.

Statistical methods:-

The researcher used the statistical bagspss and adopted the following statistical methods:

1- Testtest.T for:-

 A- Testing the significance of the differences between the experimental and control groups for the purpose of equivalence.

 B- Testing the significance of the differences between the experimental and control groups for the purpose of achievement (post-test).

  n:(n1+1)

  J1 = N1×N2+ ------------ -Mg R1

  2

  Since:

  J = tabular score

  N = number of sample members

2- Pearson correlation coefficient to measure the stability of the research tool:-

Since:-
$$R= \frac{\Sigma X1 - X2 - n\,\overline{X1}\,\overline{X2}}{\sqrt{\Sigma X12 - nX12\ \Sigma X22\ nX22}}$$

R = correlation coefficient. , N = number of students, X1 = grades of the first application.

X2 = scores for the second application. ,Σ= The process of addition (Melhem, 2000, p. 263)

1- Coder-Richardson equation -20-Kuder – Richardson "20"

This is to verify the stability of the achievement test according to the following equation:

whereas :-
$$R11= \frac{N}{N-1}\left[1 - \frac{\Sigma pq}{\sigma 12}\right]$$

R11 = test reliability.

N = number of test items.

σ_{12}= the square of the standard deviation.

P = Percentage of students who passed each section.

q = percentage of students who made a mistake in each paragraph. (Melhem, 2000, p. 265)

2- Paragraph difficulty equation:

It was used to calculate the difficulty of each section of the achievement test:

$$\frac{\text{The number of correct answers in the upper group + the number of correct answers in the lower group}}{\text{Number of students in the two groups}}$$

(Odeh, 1999, pp. 289-290)

3- Paragraph recognition equation:

It was used to calculate the discrimination power for each item of the achievement test:

$$\text{Paragraph highlight} = \frac{\text{The number of correct answers in the upper group - the number of correct answers in the lower group}}{\text{The number of students in one of the two groups}}$$

(Odeh, 1999, p. 288)

4- Effectiveness of wrong alternatives

This method was used to find the effectiveness of incorrect alternatives to the first question items in the post-achievement test.

Effectiveness of the alternative =
$$\frac{\text{NAM - NDM}}{n}$$

It represents:

N M = number of students who chose the wrong alternative from the top group.

n a d = number of students who chose the wrong alternative from the lower group.

N = the number of members of one of the two groups. (Al-Zahir, 1999, p. 91)

Schedule (6)

Results of the Mann-Whitney test for two independent samples for the two research groups in the cognitive posttest

The significance at Level (0.05)	The value is man and me		Total ranks	Average Ranks	the number	the group
	Tabulation	Calculated				
Statistically significant in favor of the experiment	23	5.500	71.50	6.50	11	Experimental
			204.50	17.04	12	Female officer

To show the effect size (extent of effect) of the independent variable on the dependent variable: the researcher used the ITA square equation to extract the effect size (d) for the independent variable in the dependent variable, as shown in Table (6).

Schedule (7)
The effect size of the independent variable on the dependent variable

The amount of effect size	valued size	Effect	Subordinate	Independent variable
big	0,84		Students of the Institute of Fine Arts	Infographic design skills

By extracting the value (d) which reflects the size of the effect, which is (0.81), which is an appropriate value to interpret the size of the effect and a large amount for the variable of infographic design skills according to the gradient set by Cohen (1988, Cohen), as shown in the table (7)

CONCLUSION

1. Infographic design skills for the benefit of the experimental group and can be used as an effective tool in learning and teaching to help the learner improve and develop skill performance.

2. There is a tracetoInfographic design skills for the benefit of the experimental group

Recommendations

1. Including topics and skills related to modern technologies that prepare students for the labor market and their practice by students within the skills of infographic design.

2. The possibility of benefiting from the model to develop design skills for students of the Institute of Fine Arts in particular and the educational process in general.

Proposals

1. Infographic design skills in developing marketing skills for students of the Institute of Fine Arts in the subject of advertising art

2. Infographic design skills by experimenting with content designed for teaching in various specializations.

REFERENCES

Abdel Latif, Ashraf (2016). The interaction between the display style and timing of infographics and its impact on developing achievement and learning motivation among secondary school students. Journal of Scientific Education, (A) (28), pp. 42-121.

Abu Al-Rub, Ahmed. (1990AD). Foundations of Skills Education, Teacher's Message Journal, Jordan, 31(4), 53-71

Al-Arabi, Ramzi (2009): Graphic Design, 1st edition, Arab Society Library for Publishing and Distribution, Amman - Jordan

Al-Omari, Aisha bint Belhaish (2015)April 11, Infographic course (PowerPoint presentation)

Al-Omari, Khaled. (2010). "Communication technologies and civilizational transformations: a study of communication technology and its effects on culture and development." Horizons Publishing House.

Al-Titi, Muhammad Hamad: Developing Creative Thinking Abilities, 1st edition, Dar Al-Masirah for Publishing and Distribution, Jordan, 2001 AD.

Attia, Muhammad. (2008). "Advertising and the Art of Persuasion: An Introduction to the Science of Advertising and Marketing of Goods." Riyadh: British Council in Saudi Arabia

Belaid, M. (2020). "Data Journalism: An Analysis of the Future of Digital Journalism."

Christoph Scheiner (1626). Rosa Ursin. Retrieved on November 11, 2020 from Cifci, T. (2016). Effects of Info graphics on Students Achievement and Attitude toward Geography lessons Journal of Education and learning. Vol 5(1) P p 155

Davidson, R. (2014). Using Infographics in Classroom. Science Teacher. Vol.81(3), 34 39

evas HM .Fiore SM, & OSER, R, I. (2002). scaffolding cognitive and metacognitive processes in low verbal ability larnins, use of diagrams in computer-based training environments. Instructional science.Vol.30(6),433-464

Fathi, Akram (2016) Density levels of stimuli in interactive infographics via microblogging and their relationship to density of posts, development of visual thinking skills, and development of visual learning objects among students of the General Diploma in Education, Journal of the Egyptian Society for Educational Technology, vol. 3 (264), pp. 225-274

Ferreira, J. (2014, August 14). Infographics. An introduction. Technical Report.

Gningue, S. M., Peach, R., Jarrah, A. M., & Wardat, Y. (2022). The relationship between teacher leadership and school climate: Findings from a teacher-leadership project. Education Sciences, 12(11), 749. https://doi.org/10.3390/educsci12110749

Hassan, Soha. (2019). "The role of infographics in digital marketing: a case study of Nintendo."

Hussein Mohamed Ahmed Abdel Basit (2015): The basic foundations for activating infographics in the teaching and learning processes, E-Learning Magazine at Mansoura University, Issue (15), January 2015 Contemporary Curricula and Educational Technology

Jam, F. A., Singh, S. K. G., Ng, B., & Aziz, N. (2018). The interactive effect of uncertainty avoidance cultural values and leadership styles on open service innovation: A look at malaysian

healthcare sector. *International Journal of Business and Administrative Studies*, *4*(5), 208-223.

Jarrah, A. M., Almassri, H., Johnson, J. D., & Wardat, Y. (2022a). Assessing the impact of digital games-based learning on students' performance in learning fractions using (ABACUS) software application. *Eurasia Journal of Mathematics, Science and Technology Education, 18*(10), em2159. https://doi.org/10.29333/ejmste/12421

Kanval, N., Ihsan, H., Irum, S., & Ambreen, I. (2024). Human Capital Formation, Foreign Direct Investment Inflows, and Economic Growth: A Way Forward to Achieve Sustainable Development. *Journal of Management Practices, Humanities and Social Sciences*, *8*(3), 48-61.

Khamis, Muhammad Attia (2003) Educational Technology Operations (1st ed.). Cairo, Dar Al-Kalima Library.

Khamis, Muhammad Attia (2013). Educational theory and research in educational technology (1) Cairo: Dar Al-Sahab.

Krum, R. (2013). Cool infographics Effective communication with Data visualization and design. Canada: John Wiley & Sons

Krum. R. (2013). Cool infographics: Effective Communication with Data Visualization and Design. John Wiley & Sos. NJ.USA

Kutz, M. (Ed.). (2018). Mechanical Engineers' Handbook, Volume 1: Materials and Engineering Mechanics. Wiley

Lan spence, (2005, September5) Playfair's Commerciul and Political Atlas and Statistical Breviary. Cambridge University Press, (pp.1-35), Retrieved on November 11, 2020 from Playfair's commiereial and political atlas and statistical breviary Statistics and probability, general interest i Cambridge University Press

Mark Smiciklas(2012). The power of infographics.

Matlas, Abdul Muhammad: Curriculum Analysis, Manar Center, Sana'a, 1997 AD.

pastureTawfiq Ahmed and Al-Haila, Muhammad Mahmoud, (2009), General Teaching Methods, Dar Al-Masirah for Publishing and Distribution, Amman.

Quiroga, C. V. (2004). "Graphic Organizers: A Review of Scientifically Based Research". Monograph published by Mid-continent Research for Education and Learning, 1-36.

Rashid, A., Jehan, Z., & Kanval, N. (2023). External shocks, stock market volatility, and macroeconomic performance: An Empirical Evidence from Pakistan. *Journal of Economic Cooperation & Development*, *44*(2), 1-26.

Shaltout, Muhammad Shawq (2019) The developed educational infographic model, the Seventh - Fifth International Scientific Conference of the Egyptian Society for Educational Computers, July 17 - 19, 2019 - Port Said - Egypt, vol. 7 (AS) (1), p. 19

Shaltout, Muhammad Shawqi (2016). Infographics from planning to production (1st ed.). Riyadh, Kingdom of Saudi Arabia Cataloged by King Fahd National Library for Publishing

Smiciklas, M. (2012). "The Power of Infographics: Using Pictures to Communicate and Connect with Your Audiences.

Smith, J. (2018). Developing Skills and Capacities: A Practical Guide for Education and Training. McGraw-Hill Education Sons, Inc., New Jersey.

Suleiman, Tariq. (2014AD). The effectiveness of a computer program for developing artistic creativity skills among female students in the Department of Education Technical Colleges of Specific Education, Reading and Knowledge Magazine, Egypt, Issue (147), 233-279

Sweller, J. (1994). Cognitive load theory, learning difficulty, and instructional design. Learning and instruction, 4(4), 295-312.

Tashtoush, M. A., Wardat, Y., & Elsayed, A. M. (2023a). Mathematics distance learning and learning loss during COVID-19 pandemic: Teachers' perspectives. Journal of Higher Education Theory and Practice, 23(5). https://doi.org/10.33423/jhetp.v23i5.5933

Tashtoush, M. A., Wardat, Y., Aloufi, F., & Taani, O. (2022). The effect of a training program based on TIMSS to developing the levels of habits of mind and mathematical reasoning skills among pre-service mathematics teachers. Eurasia Journal of Mathematics, Science and Technology Education, 18(11), em2182. https://doi.org/10.29333/ejmste/12557

Wardat, Y., Jarrah, A. M., & Stoica, G. (2021). Understanding the meaning of the equal sign: A case study of middle school students in the United Arab Emirates. European Journal of Educational Research, 10(3), 1505-1514. https://doi.org/10.12973/eu-jer.10.3.1505

YSorry, Iman Ahmed. Skills and ways to develop them". IBN AL NAFEES Publishing, 2020.