Effectiveness of the Use (3D) Animation Programs to Development the Skills of Architectural Students in Designing; The Architectural Departments - College of Engineering- Baghdad University Model

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Abstract
During the 1990s, anime appeared as one of Japan's cartoon Art , Anime is derived from the English term "animation". This type of animation is characterized by high quality in drawing pictures. As the first anime film appeared in Japan in 1955, this time came the appearance of the legendary cartoon "Osamu Tezuke" Who founded the rules of the Japanese animation world. The aim of the research is to develop the skills of the students of the first grade - architecture in the use of (3D) three-dimensional programs, dedicated to the production of motion graphics educational films for the design of buildings, which helps students to attract the recipient through the investment of all elements (size of the shot, movement of the camera and changing the angles of vision) Integrated for construction entrepreneurs. The researchers seeks to explain the stages of planning in the production of animated drawings, including the preparation of the idea, the scenario, the preparatory drawings of the buildings and backgrounds and the type and size of furniture according to the size of the rooms according to the variety of standards and requirements for the production of design and within the required specifications.

Keywords: Education, animation, architecture students, integrated for construction, production planning, buildings, standards and requirements, animated drawings, Students skills.

Introduction:

In traditional teaching process, teachers often using texts, simple graphs, slides and material objects as teaching aid means to enhance teaching effect. But, complex things, substances, principles, concepts and conceptions can only be taught in the form of text and imagination and finally form very abstract concepts. Comprehension requires rich spatial imagination ability. Thus, it is especially difficult to impart such knowledge. Because of rapid development of multimedia technology, the "researchers" tried to use technical methods to transfer pictures from its stability to more active projection by using (3D) animation to enhance teaching effect.

Anime is one of the types of animation produced by Japan, and the anime is derived from the English word "animation". Manga: The term used by Japanese for storytelling, used outside of Japan to denote comic books produced in Japan, or comic books drawn in a style similar to Japanese. This term may be used to refer to the industry related to this art as well as to the media through which it spreads (journals, magazines, etc.). Manga is a social phenomenon in Japan, which deals with almost all subjects (romance, adventure, science fiction) and goes to all segments of society as a whole. And is one of the most successful experiences in the field of comics globally. Japan's weekly Manga revenue is equivalent to the annual revenue of the American comics industry.

In the early years of 1914, talent in the world of animation began in Japan at the hands of amateur painters. The manifestations of these beginnings were markedly influenced by American and European graphic artists

Definition of Animation:

The word ‘Animation’ is derived from the Latin word ‘Anima’, which means soul. It breathes life into imaginary characters. It is gaining popularity in the world of entertainment & multimedia. Apart from being a source of entertainment animation is also an educational tool. It is a form of art that is celebrated in the world wide film festivals.

The "researchers" definition for Animation can be defined: as an illusion of motion. It is the process of creating the illusion of moving images & model by displaying sequential images in rapid succession.

Definition of Multimedia:

Vaughan and Judith agreed that "Multimedia is a combination of written texts, drawings, linear configurations, sound, music, animations, static and animated images provided through a computer. These are multimedia elements, and at least three elements are used in the program. The multimedia system relies on a computer or system And an interactive prerequisite for this system. "(Judith and Vigan,1995)[(1)].

[1] . Judith Jeffcoate . Multimedia in Practice technology and application. New Yourk. The RAISE language group. 1995. P7-8.

According to Reves, multimedia is a computer database that allows the user to access information in various forms, including written text, graphics, video and audio, and calls the learner the information he needs according to his needs and interests. The word Multi-Media is composed of two "Multi" "Means any means or means that means the use of a range of communication media such as audio, video or image in a combined and integrated in order to achieve effectiveness in the process of teaching and education, that is a mixture of elements placed in a general format, consisting of a variety of different means of communication . (Thomas C. Reves 1993)[(2)].

Digital animations that can be produced by a computer are classified into two types:-

2D animation:

Where the item is placed at a certain point so that the computer calculates one of its dimensions to be the starting point, and then placed at another point after that to form the end point and the computer calculate coordinates as well. The computer then calculates the coordinates of all the points on the linear path between the two points that have been identified as the starting and ending points.

The computer then starts to place the element at each point of the path it selects after clearing the item from the previous point, so the element appears to be moving from one point to another, and with certain speeds displayed, the element appears to flow in a smooth flow from the starting point to the end point Then produce some animated graphics.

3D animation:

The process of designing a three-dimensional moving element through the creation of a hometown, the creation of a profile, the creation of a horizontal projection, and the introduction of these three projections into three-dimensional animation design programs are integrated into a basic form of the element.

When this model is complete, it is safe to add the effect of light and shadows to this display. The effect of shadow and light changes when the element moves, giving more realism and motion to this model.

Through the" researcher's" analysis of many studies and sources similar that dealt with the use of computers in the production of animation films found that the programs used in production are divided into two types:-

1. Multimedia programs:

Multimedia programs such as Flash and Directors, which are programs used specifically for the production of educational program, but the ability to download graphics, sound and video and included the tools of animation and drawing tools and audio tools, enabling it to produce a film animation two-dimensional small size can Upload it easily on the Internet.

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[2] . Thomas C. Reves. Evaluating Interactive Multimedia, Educational Technology . May, 1993, P. 47.

2. Specialized animation production programs:

It is a software specially designed to produce motion graphics movies, divided into two-dimensional programs that tend to focus on hand-processed images, and three-dimensional programs that usually rely on the construction of virtual worlds where moving objects.(3D) animation can create images that look real to the viewer.

The "researchers" start to adopt the use of programs that produce (3)Dimensions require a long period of training to produce an educational film drawings with all the elements of production and the "researchers" confined to in the list of skills to produce animated graphics animation skills of production of (3D) animation.

Pre- studies:

1. Qiong Wang.(2017). Design of 3D Animation Special Effects in Animation (3D) Modeling Teaching Based on QFD Theory.

A multimedia teaching device based on synchronous text teaching content display was designed by utilizing multimedia and animation technology. The device can make relevant text appear synchronously while the teaching video is played. It can achieve perfect combination of video and text, reduce learning load and improve learning efficiency. To estimate this new teaching device, we chose the students as the objects of study before and after using the device, and combined QFD theory for quantitative evaluation. Finally, such conclusion was drawn that this teaching device indeed has an ideal teaching effect. [(3)]

2. Denis Dedov, Mikhail Krasnyanskiy. Design and Development of Adaptive Simulators Using 3D Modeling.

The analysis of the effectiveness of adaptive training systems for training personnel to work in regular and emergency situations at the enterprises of chemical-technological profile was performed. It is concluded that for the chemical industry the simulators based on interactive 3D models of production facility are the most effective. The analysis of the main causes of emergency in the chemical industries allows developing a structure of the automated information system, which is a major component of the training complex. The classification of all basic objects of the virtual space was performed to formalize approaches to create simulators based on interactive 3D models of production facilities. The combination of these sets of the main objects of virtual space together with many auxiliary facilities (light sources, animations, etc.) allowed to produce a formalized model of the virtual space of production facility. The proposed theoretical approaches were implemented in the development of adaptive training complex for training personnel of chemical enterprises in the Tambov region, the Russian Federation.

[3] Qiong Wang (2017). Design of 3D Animation Special Effects in Animation 3D Modeling Teaching Based on QFD Theory. China .University of Science and Technology Liaoning, Anshan. iJET – Vol. 12, No. 7, 2017.pge:(90-100).see. https://doi.org/10.3991/ijet.v12i07.7218

The developed adaptive training complex is focused on the use of 3D models of virtual reality. It also provides the possibility of training on the real object with the use of augmented reality technology. [4]

3. Ahmed Talaat study (2009)

The aim of the study was to design an animation-based educational program to provide English language skills to students of basic education in order to achieve the following objectives by: (1) defining the English language skills required for the development of basic education students through animation programs; To measure the effectiveness of the proposed program in the achievement of English reading and writing skills among students in basic education.

The importance of the study lies in the need to use animation-based computer programs in the educational process and to contribute to the development of educational software production using animation programs to provide English language reading skills to primary school students. The study sample consisted of (15) students of the fourth grade in the school of nuns in Damietta city. The limits of the study included 1. Human limits: a sample of 15 students of the fourth grade in the school of nuns in the city of Damietta. 2. The temporal boundary: the second semester of the academic year 2008, 2009. The researcher followed two approaches: analytical descriptive approach . Results showed statistically significant differences in favor of animation-based software.[5].

The Benefits of the pre-studies:

The "researcher" benefited from previous studies:

1. To define the basic technical of design for animated educational drawings.
2. Determining the components of the technical design and its standards.
3. Familiarity with international technical schools of 3Danimations such as "Disney School" and "East European School" and the extent to which these technical schools differ in the films they produce.
4. To recognize the different methods of producing animated drawings, where the technical studies were characterized by deep and professional in this area, so that the methods of producing animated drawings.

In this study the "researchers" exceeded the (20) methods and tried to inventory and provide the most common methods used for student at the architectural departments-College of Engineering.

[4].Denis Dedov, Mikhail Krasnyanskiy , Artyom Obukhov and Alexey Arkhipov. Design and Development of Adaptive Simulators Using 3D Modeling. International Journal of Applied Engineering Research ISSN 0973-4562 Volume 12, Number 20 (2017) pp. 10415-10422 © Research India Publications. http://www.ripublication.com.

[5]. Ahmed Talaat Mohamed Sahloul.(2009) The effectiveness of using animation software to improve English language skills in the basic education stage. Msc.unpublished. Egypt. Mansoura University, Damietta Branch. College education quality . Computer Teacher Preparation Section. 216 pge.

The "researchers" extracted the main points of the educational and cognitive content to be taught to the architectural students so that they can produce motion picture animation films:-

1. Introduction to the theory in the production of 3D instructional graphics films
2. Design (3D) animation Scripts.
3. Design cartoon characters and prepare them to work within the animation program.
4. Prepare audio elements.
5. Design animation scenes cartoon characters.
6. The Ultimate Film Editor.

Steps to Design 3D Using a Computer:

1. First Step: Scenario Preparation: the Scenario which contains a general description of what will be done with the computer, including description of places, lighting, events and dialogue. The film scenario is divided into two main elements:-
a. **The written script**: script which includes all the details that will be performed in the film, including how to move from scene to scene, the dialogue that will record the film, character description, background, nature of the music and description of the characters' voices.
b. **The Drawing Scenario**: it is the guide to tracking the events of the movement in the story of the film, where the scenes are cut and identify the required footage, and personal planning and dialogue appropriate, and is clear relationship to the background and description of the event, taking into account the nature of cameras and lighting and perspective when designed.

2. Second Step: design characters and backgrounds:

This will includes:

a. **Design of cartoon characters**: Drawings that show the cartoon characters that will appear in the film and include size, clothing, emotional characteristics and relationships with other characters.
The characters can be drawn manually and then inserted into the computer by the scanner or drawn directly using graphics design software available specifically for this purpose, whether characters that will be designed two-dimensional or three-dimensional.
b. **Background design**: means by the places where the story of the film is going. They are used to confirm the type of climate in which they live and confirm their dramatic psychological atmosphere.

3. Third Step: Audio recording:

One of the most influential factors in the success and effectiveness of motion graphics is the use of sounds, sound effects and stylized music that are of their own character, aiming to create value, increase interaction, attract attention and stimulate the mind. A sound factor is one of the most important elements that helps the success or failure of designing a movie animation.

4. Fourth Step: Animation:

The movement plays an important role in the effect of motion graphics. It is the boundary between the drawing and the motion. When drawing frames, the frame of the first frame and frame is called motion. These frames are called the main movement keys. The frame Interchangeable Keys.(Mohammed Dhahi .2014)([6])

5. Fifth Step: The editing

At this step, video editing software is used, where all the production elements produced in the previous stages are assembled. The footage that is taken individually is assembled into a scene-sized snapshot with the numbering of each scene. At this step, which then took place in the previous stages and then treated or re-produced again, and then all the elements of the sound are assembled from music, dialogue and effects and linked to the image so that each audio element is associated with its own scene. In the final step all the scenes are included in a single film file.(Wong.2013)**([7])**.

Case Study:

The "researchers" seeks to adopt a program prepared for Architectural students in designing extends to (3) months/student of the 1st year. ., The experimental treatment material, of animation-based program, was designed to provide students with the basic skills of producing animated educational drawings by training them to study the modules in a sequential sequence. In accordance with a training program that continues according to a timetable that lasted for (6 units/3 months).

The program starts from teaching the elements of the animation drawings and ends with the production of the films, which is the project of each student after the completion of the training period. In order to ensure the production of educational drawings in accordance with logical sequence steps arranged. At the end of (6units/3 months) each student will subject to the final evaluation through the submission of the final project. See table (1:2) show aspect of (3D) Animation programs prepare for the experimental group of Students, and students (3D) educational animation movie.

[6] Mohammed Dhahi Mohammed Tony Abbas. The use of integrated learning in the acquisition of students of the Department of Technology Education some of the skills of the production of educational cartoons and the development of their attitudes towards them .Ph.D. thesis. Cairo University . Institute of Educational Studies and Research. Department of Education Technology. 2014. Pge. (67-70)

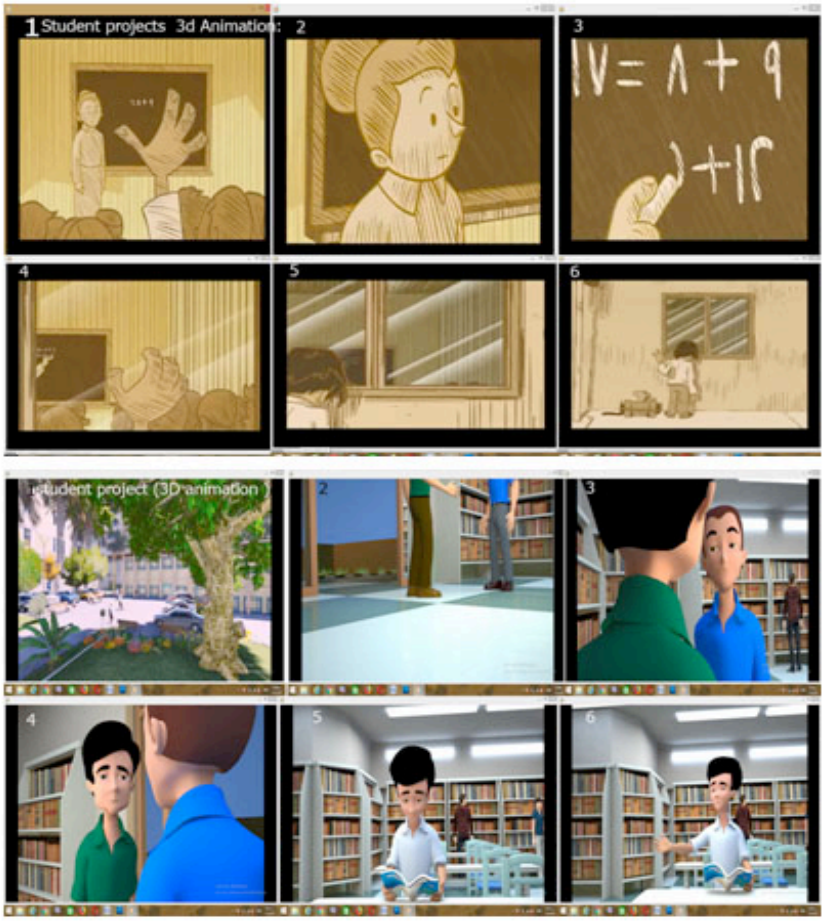
[7] *Yue-Ling Wong,* Digital Media Primer: Digital Audio, Video, Imaging and Multimedia Programming*, 2nd ed., Upper Saddle River, NJ: Prentice Hall, 2013. (ISBN-10: 0132923874. http://users.wfu.edu/ylwong/publication/index.html*

	Table (1). Presentation of the educational program.			
Seq	Units	Subjects	Method of implementation	Duration
1	Presentation of the educational program	1.Clarification of the general objective. 2. Explanation of sub-goals. 3. Presentation of models of educational films. 4. Explanation of how to use in the e-learning site. 5. Explain how to implement cooperative education. 6. Explain the Assessment. 7. Distribution training schedule. Teaching the animation elements.	Traditional lecture Send a summary of the lecture via e-mail to students Distribute lecture content	1 month

	Table (2). Presentation of the educational program.			
Seq	Units	Subjects	Method of implementation	Duration
1	Practical training on the performance and the students skills	Preparing reports on the most important differences between (3D) animation movies	Evaluation of student activity	1 month
		Download a collection of educational (3D) animation films and write a paper about elements shared between each educational animation films	Evaluation of student activity	

	Ttable (3). Presentation of the educational program.			
Seq	Units	Subjects	Method of implementation	Duration
1	Practical training on the performance and the students skills	1. Write the movie title 2. Formulation of the general idea 3. Compiling a synopsis for the film 4. Writing a script for the film 5.Choose a program to execute the movie	Practical model:	1 month

See : Student projects models (3D) animation educational films



Conclusion:

The training program has contributed positively and effectively to the theoretical knowledge of the skills of producing 3D animation films among the students of architecture at the University of Baghdad, the researchers recorded some points during the program

1. This study was characterized by the superiority of the students of the (experimental group) who were joined and subjected to the (3D) animation program, and students of the (control group) that studied using traditional education. The first group acquired the skill of education and the profession of producing animation films which opens up the horizons of work within the labor market and the production of educational films
2. The impact of producing (3D) animation of educational film is different among the students compared to the students' projects. That can be related due to individual differences in the acceptance of the program and acquiring the student's skills at the same level.(excellent for best (3D) movie /accepted for pass) project at the end of the course.
3. The training program actively and positively contributed to the skills of producing (3D) animation films for architectural students at the University of

Baghdad, and its impact was much stronger than the traditional way of developing this aspect.

4. The "researchers" recommended to add a complete course for the production of (3D) animation films for the student list for the Department of Architecture for undergraduate and postgraduate stages.

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7. Yue-Ling Wong, *Digital Media Primer: Digital Audio, Video, Imaging and Multimedia Programming*, 2nd ed., Upper Saddle River, NJ: Prentice Hall, 2013. (ISBN-10: 0132923874).see. http://users.wfu.edu/ylwong/publication/index.html

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