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Place of flip book animation technique in communication design education

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Abstract

Due to the interdisciplinary nature of design education, it has a very broad spectrum ranging from motion picture to informative design methods. Animation techniques are also one of the important parts of this wide variety of work. Today, almost every institution is involved in animation techniques in design education. Animation with various application methods is the field where the most creative examples of motion pictures are revealed. The purpose of this research is to discuss the place of flip book animation in design education and to investigate its contributions to design education, which is one of the creative animation techniques.

It is considerably significant that students experience how the form of motion pictures is created through one of the methods at a beginning level and understand the nature of motion picture in design education process. Flip book animation, is a method by which students will be able to grasp the logic of creating motion pictures using static drawing or photography. Flip book animation is one of the first animation techniques to be achieved by combining successive still images processed with different surfaces. It may be considered as an old and outdated motion pictures technique for that reason, yet there are still flip book festivals and it is used as an effective method in teaching animation process.

Keywords: Flip Book Animation; Animation Production Techniques; Motion Pictures; Animation, Design Education.

1. Introduction

Design education is a process that designed for students to develop their knowledge and skills in a broad range of disciplines. Moreover, design education is a medium which allows the transition from the inexperienced beginner to the well-equipped graduate designer. Therefore, the complex set of concepts, various forms of knowledge, instrumental ability, judgmental skill and professional norms and applications that should be transferred in the educational environment is immerse (Oxman, 2001, 270).

Undoubtedly, motion pictures, animation and cartoon concepts are some form of design that will be linked to each other. It is impossible to think motion pictures separately from design. Just as it is in other design disciplines in motion pictures there is an intellectual process, designing process, drafting process and application process prior to product emergence. Teamwork and combination of people with different skillsets should come together for such different dimensions to be realized.

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As far as students are concerned, animation education is a very complex and challenging process that requires imagination and a high level of drawing ability, as well as the ability to have optimum knowledge in physics laws, mathematical calculations, general culture and pedagogical issues. A scene with a bowling ball falling down and jumping and a scene involving the falling and jumping of a soccer ball is a clear example of how the designer should have knowledge of the laws of physics, though it seems the same. Alternatively, it is a mathematical calculation to consider the difference between the step movements of a mother and her baby polar bear ascending from point A to point B, since there is a proportional difference between the mother and the baby polar bear. Finally, in a movie where the hero is a cute child, it can be quite uncomfortable for parents to have a scene that shows the child wiping her mouth after she has eaten yogurt. Because children learn life from cartoons and follow the heroes there. Taking this into account, it is necessary for a cartoon designer to have optimum pedagogical knowledge.

What might be the starting point for such a complex process that requires such a different dimension and a higher level of abilities? The design education process usually starts with pattern drawings and basic design principles from live and inanimate models. The drawing practice here is also the first stage of the motion picture creation process. Therefore, this first step in the animation education process should make them feel what the problems that students will face in future projects. In addition, the presence of a simple application that allows learning of entertaining, exciting, and movement and time events has an important place in the development process of the student.

2. Design Education in the New Era

The notion of design has a broad range of meanings, which may change in language. For instance, during the Renaissance period the word “disegno” was considered as “the basis of all visual arts”, using as “inventive and conceptual” in term of the making (usually referred to as drawing) of art such as paintings and sculptures (Walker, 1989, 4).

The origins of design education extend back to ancient times due to its relation to art. It would not be a wrong approach to reconcile designs at that time with engineering, but the industrial revolution that started in the 1900s led to the creation of an alternative discipline that carried the design concept to many different dimensions and responded to the different needs of human beings. In this context, Bauhaus undoubtedly is one of the first schools to consider in terms of the history of the design education. The artistic and pedagogical achievements of the Bauhaus School were revolutionary both in Germany and in Europe completely. Its objective to modernize art and architecture was in same direction with other efforts, from which it outlined countless theories for its own work. Still, the school's historical importance cannot be overestimated (Siebenbrodt & Schöbe, 2009, 8).

It is not wrong to say that Bauhaus School is the foundation of modern art discipline of any description, in which artist, and artists that provide artist education. In artistic aspects, Bauhaus may be considered as a symbol for revolt or riot against the traditional. Because, Bauhaus School is an institution that sheds light on the age with art, design, architecture and industrial design where alternative artistic methods have been taught and implemented against "traditional" and "dictation by force". In a nutshell, Bauhaus has shown the means to be creative beyond the age to the artists of the near history by leaving being creative traditionally behind (Bingöl, 2017, 70). The designers and artists received education in this period, played a significant role to develop new curricula. For instance, The Ulm (Hochschule für Gestaltung Ulm), was one of the most important institutes of the 1950s and 1960s, swiftly gained international recognition. New attitudes in design were examined and put into practice within the departments: Building, Information, Industrial Design, Visual Communication, and Film.

In today's world, communication design education has an interdisciplinary structure which consists of various disciplines from drawing to computer science. Students follow new technologies and try to keep pace with changing design needs. Especially 3D applications and motion pictures

have become indispensable parts of visual communication. Now, barely twenty years into the digital revolution, most of the methodologies, much of the media, and many of the standards have inexorably changed. Arguably, the digital revolution created an upheaval as significant to the big round world—no less the smaller, flat design world—as Gutenberg’s printing press was for centuries after it was invented (Heller and Womack, 2008, 11). Digital technologies have a huge impact on the way of designing, however, in order to exhibit a well-designed work, the designer still needs to have advanced talent and creativity.

The digital ethos and the any kind of gadgets have grown into an inseparable part of our daily lives that we take most of them advance for granted. To be an artist, it is necessary to be a technologist as well. Many young designers are more interested in the latter than the former and afterward fusing technology and art into design (Heller and Womack, 2008). Since, with the developments of the Internet and mobile technologies, interface designs and user experience have become a significant issue among designers and they need to work with the interdisciplinary approach. Besides, designers have generated solutions for digital platforms by using digital technologies. So, in order to fuse technology and art into the design, designers still take advantage of basic design principles. Also, there are still various techniques, which are invented more than a century ago, in order to develop creative ideas.

3. A Brief Overview of Animation Techniques

According to Sito (2015, 20) from Prehistoric times’ cave paintings with different animal drawings with multiple legs to sketchbooks of Leonardo DaVinci, people have tried to create images which have an impression of moving. To tell stories about great wars, epics or expeditions people designed, painted, carved images with figures and put in the order that spectators watched them. All these antique artifacts, along with a goblet of narrative and sequential pictures, dating back 5200 years from today to the archaeological excavations in the Burnt city of Iran, are the result of the efforts of mankind to obtain motion pictures. A deer figure on this goblet jumps over trees with successive movements. The famous examples like Standard of Ur (BBC, 2010), Assyrian palace reliefs (British Museum, 2017), Trajan’s Column (Gombrich, 2007) or Tapestry of Bayeux (Bridgeford, 2004) had a narrative form of expression, composing of sequential images which have several characteristics in common with the storyboard.

The word “animation” is rooted in the Latin verb “animare” that means “to give life to” stating that the illusion of movement (Selby, 2013, 9). We can also define the animation as “to make non-existent movements exist” or “to revive inanimate objects”. The artificial form of all these applications is called the “timeline”, and the eye that follows the movements following each other in an eclectic way depicts a form of motion that is not actually present in the brain.

The Scottish-born famous animator Norman McLaren asserted; “Animation is not the art of drawings which move, but rather the art of movements that are drawn.” (Selby, 2013, 9). This statement confirms the purpose of the existence of works containing images that are constructed in the ancient times and consist of successive images. Especially Trajan Column, in terms of the birth of the Roman Emperor, the whole life and the war campaign against Romania, motion pictures may be shown as one of the earliest examples of the concept. The story depicted with relief technique starts, develops and finishes, at the column of approximately 38 meters. Of course, it is not possible to say that this antique work still preserves its existence today is a conventional motion picture. However, it can be said that the creation logic, the design and the eclectic layout and the structural features, are the efforts to create a complete motion picture form.

In the simplest form, the animation may be any sort of moving image that produced by the means of film, video or computer which is able to visualize change over time, space or characteristics. Animations regularly operate multiple frames per second, and there is a significant difference between computer “slide shows”, which are a series of graphics presented simultaneously, and animation perception (Lobben, 2003, 318).

For creative people animation is the most dynamic and productive form of expression. Animation has an inter-disciplinary nature between art and craft, embracing drawing, model-making, sculpture, computer science, dance, performance, social science and much more. It has a unique language which empowers to create the art of impossible (Wells, 2006, 7).

Storyboards are the first point where the motion picture starts to form. After the script is created on the sketches, each movement is depicted in a format that will take 24 frames per second. The frequency of the speed, emotion and movements of the space that follows each other vary. The name of this application is "frame by frame" animation and can be applied both traditionally and digitally. The point to take into account by the designer is the relationship between frames. The designer should provide a continuous flow the audience. In producing animation, "key frames" are the most important frames, which are the fixed states that a guide designer creates. These key frames are the first and last frames to show the sequence of action (Lupton & Phillips, 2008, 222).

Despite all the possibilities of digital technology for artists and designers today, the ability to imagine and draw preserves its existence as one of the most influential factors in the formation of a motion picture form. Cartoon designers are still benefiting from sketch books and draft drawings. Because it is well known that all existing digital technologies cannot think, imagine, create anything, and only exist to facilitate the designers' work and to take it to a higher level. Even if computer technologies, tablets, software, or portable applications exist, today's two-dimensional animated films take their roots from philosophical toys of 1800 's created with extremely primitive methods. According to White (2012, 6) even the best animators in the Pixar studio still pretty well hold to the same production process which was used many years ago by legendary traditional 2D animators once at the great Disney studio.

4. Flip Book Animation Within Communication Design Education

Flip book has been importance in history of animation because it based on an essence of animation, key frames. Each page representing a frame and it may consist of photographs or drawings. All pages in sequential order which display series of movement. Flip books look like a stapled notebook or any other kind of bounded books. To get an idea of the motion, artists would use a flip book basically flipping rapidly through the pages of a book sequentially (Stam, 2016, 4). Flipping essentially is where an animator keeps a pile of animation drawings (highest at the top, and the lowest numbers at the bottom) and looks them when they flip quickly from bottom to top (White, 2012, 6). Moreover, this visual experience is directly related to "persistence of vision" as mentioned above.

As far as flipbook animation is concerned, people have tried to create some entertainment devices. These devices, which are based on different periods, such as the Renaissance and Reform movements in Europe and the Industrial Revolution, are defined as "Philosophical toys". It is worth mentioning at this point that throughout the history of mankind, efforts to create a motion picture or to record on a visual sensitive surface have never been made by artists or people interested in art. Experiences of these new and different devices have always emerged as a result of an accumulation of knowledge by chemists, inventors, doctors, and technicians who may be defined as engineers who relay information from one period to another.

Before the flip book as we know today has existed, we can say that they are technological and technical devices, considering the fact that such scientists and technicians invented such devices. Examples of these devices include zoetrope, phenakistoscope, kaleidoscope, stereoscope, pseudoscope, praxinoscope. All work manually in a completely mechanic system.

In its most basic form, a flipbook a physical book which contains various pages with static images. When the readers start to flip through all of the pages of book at an even pace, they can see a short animated movie (New York Film Academy, 2014). To get an idea of the motion, artists would use a flip book basically flipping rapidly through the pages of a book sequentially. However, in this case, each page has a hand-drawn picture on it created by the artist. By a process of trial and

error and intuition, a final fluid like animation is created. Like that. Some artists were amazing at doing this. (Stam, 2016, 4).

It has been estimated that the invention of flip book was long before the other mechanical motion picture devices. Although the Frenchman Pierre-Hubert Desvignes is broadly credited as the inventor of the flipbook, the first person to patent the invention was John Barnes Linnett from Britain who was a lithograph printer based in Birmingham. The patent dates back to September 1868, when it was called the kineograph. Early flipbooks was a single staple binding that composed of illustrations stacked in sequential phases of movement. As mentioned above, when readers flipped the pages, they would create an optical illusion which looks like motion (Bendazzi, 2016, 15).

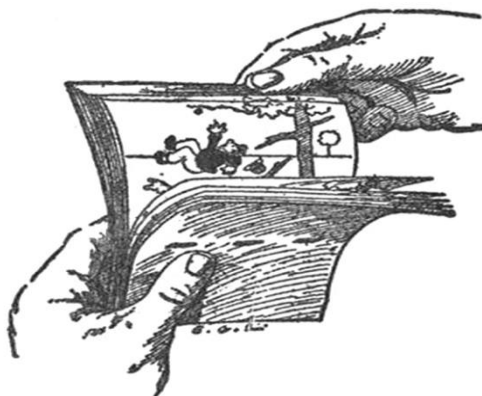


Figure 1. The kineograph or the first “flip book”. Reprinted from *The Art of Fluid Animation* (p. 3), J. Stam, 2016. Florida: Taylor & Francis.

Flipbooks were popularized in the early twentieth century by various manufacturers who gave their customers away as free in-pack prizes (Bendazzi, 2016, 15). For instance, The Liggett & Myers Tobacco Company manufactured a Turkish cigarette brand under the name Fatima. The company marketed Fatimas via various platforms such as magazines, radio, and television. Flipbooks were one of their marketing strategies, and they released ten flipbooks with the theme of modern dance in 1914 (Mellby, 2010). This flip book (Figure 2) demonstrated dance figures and instructions gradually. This tiny books which have essence of motion pictures are still producing today.



Figure 2. The Maxixe. Liggett & Myers Tobacco Company, Fatima moving picture dance book, 1914. 50 x 65 mm. Reprinted from Kineographs. Princeton University Library, Graphic Arts Collection, J. Mellby, 2010, February 10, Retrieved from <https://www.princeton.edu/~graphicarts/2010/02/kineographs.html>

Flipbook animation also have used by filmmakers and artist to create visual illusions. Composed of scores of minimal, abstract ink drawings, each page differing only slightly from the ones following and preceding it, Breer's *Image by Images* (Figure 3) was the first artist's book to employ the Victorian "kineograph" or "recorder of movement." (Uroskie, 2014, 95).



Figure 3. Robert Breer, *Image by Images*, 1955. Kineograph or flip book. Reprinted from *Between The Black Box and The White Cube*. (p. 95), A.V. Uroskie, 2014, Chicago: The University of Chicago Press.

After the success of flip books, another device called 'Mutoscope' invented by by W.K.L. Dickson and Herman Casler. It presented to the eye photographic views of objects in motion in manner so lifelike as to border on the marvelous (California Digital Newspaper Collection, 2008). Furthermore, the simple technology of the flipbook doesn't need the camera, film, projector or theatre system that we summarize with the locution 'cinema', thus demonstrating that even before the digital era (Bendazzi, 2016, 15). Because the world of the moving image that contains various techniques and approaches have always been bigger than that of cinema. On the other hand, the flip book and the cinema are good metaphors for computer animation. Indeed, the goal of computer animation is to create a sequence of pictures that give the illusion of movement (Stam, 2016, 4).

Moreover, flip books are using as a method to develop and to test ideas during the creative process. Like the zoetrope and the praxinoscope, they are very useful to test out ideas on others but, unlike those cylindrical devices for viewing images in motion, flipbooks have the advantage of being linear in format. This allows animators the opportunity to take doodles and sketches of ideas and develop them as a linear narrative. The "movement" is created by flipping the pages quickly so that the single images appear to move as they are pieced together by the brain to make a sequence (Selby, 2013, 9).

Animation techniques generally include advanced technology and cutting-edge technology, but flipbook is the easiest way to create an animated movie. On the other hand, it is well known that the students of fine arts education have a solid drawing ability and that they often go through various drawing exams in order to be eligible to study at school. It will be a different and exciting application of flip book animation technique, which bases on drawing, for the students of visual communication design department, of which one of the basic foundations is motion pictures.

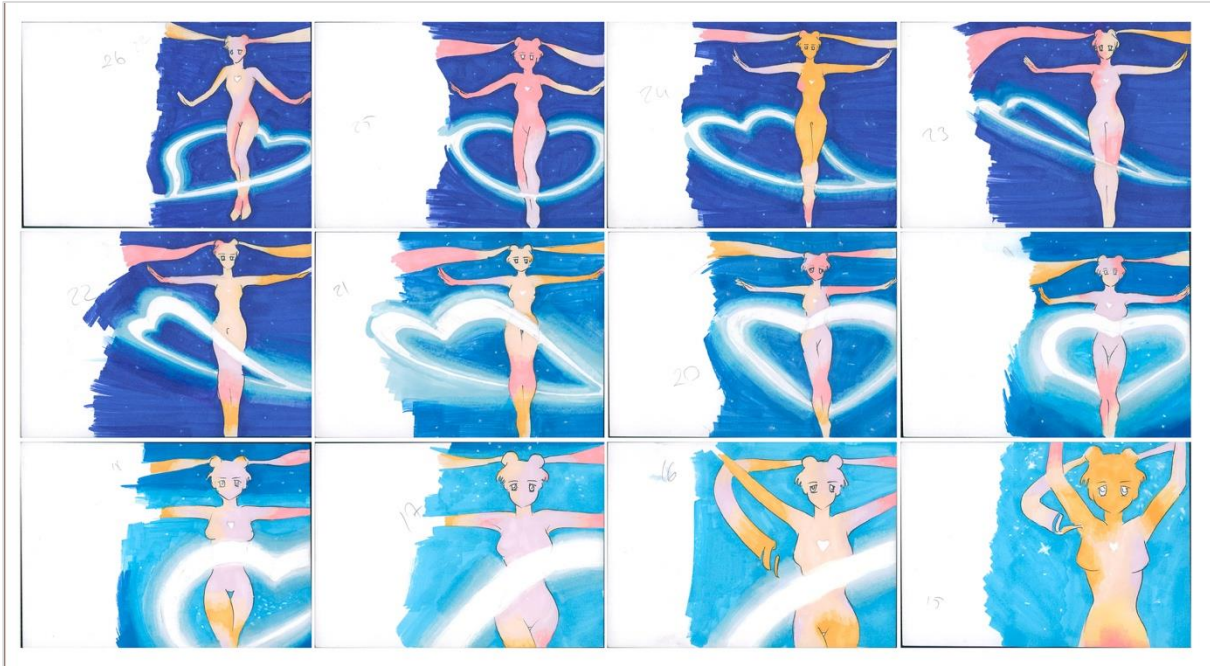


Figure 4. Sailor Moon, by Ela Onat (Student animation project).

Figure 4 illustrates a student work. Freshmen students at Visual Communication Design Department who take the course of "Animation Production Techniques" are required to make a flip book animation project in order to understand the first stage of creating a motion picture form. In the first week, the students are shown examples of flip book in a historical framework and they are provided with detailed information for creating alternative flip book methods and they grasp the concept theoretically. In the half-term project, the student began to compress a conversion scene from the main character of the Japanese cartoon series "Sailor Moon" into a series of 96 frames. Pencil and marker pen for coloring are used for the application.



Figure 5. Sailor Moon, by Selen Akdaş (Student animation project).

In an alternative application shown in Figure 5, the student has chosen to watch the Sailor Moon character with a closer look at the same project and has performed a 64-frame flip book focusing on the portrait. It is possible to say that although the student is still a freshman, she has learned to comply with composition rules, grasped the direction of movement and looking room thanks to this technique. The materials she uses are black pencil and watercolor.

5. Conclusion

Visual communication design education is a new design form that is used as an element of animation, drawing, photograph, graphic, typography, sound and video. It is observed that animation and motion pictures are the most difficult concept for students to grasp and apply during this education process. This is why the elements of visual communication design mentioned above also exist under the roof of the concept of animation. In addition to all these, it includes concepts such as animation, story building, script, synopsis, storyboard and it is not possible to create an animation film without such contributing factors.

In this complex scheme described above, it is envisaged that the first step of students to learn this different technique who take animation education may be Flip book animation technique and freshman students, who take "Animation Production Techniques" module were given a half-semester project. Students are expected to make an implementation by making use of "Sailor Moon", a Japanese cartoon cult in the first phase of the project and utilize American animation cinema in the second phase. The project has been limited to 90 to 120 frames and students are said to avoid using paper heavier than 90 grams. Because flip book animation is a combination of multiple papers and is tracked in sequential order, heavy-weight papers result in very non-user-friendly results.

Many of the students who have not yet implemented any cartoon practice left much space between the movements on the first stage of the project and observed this as a result of experiencing gaps in the film as a result. Students experiencing such a problem have resumed their drawings and found a way to correct the error by increasing the number of images that need to be taken in 1 second (i.e. drawing more squares). It has been observed that students have learned the method of frame by frame through their drawings and the importance of key frames in the animation process regardless of digital or manual drawings through flip book animation technique.

On a different scale, it has been observed that this project allows students to experience the traditional methods and get excited. That is to say, today the students who take design education are defined as "Y Generation" or Millennials by sociologists. They are the first generation who have spent their whole lives with the digital technologies (Bennett et al., 2008). So, these students consist of people who have access to the internet and portable devices, who use many interactive devices on their daily lives, use a magnetic card to ride a metro, or pay a fee to an interactive device to credit that card. Students internalize change over time by merely using pen, pencil, eraser, and colors of their choice without using any digital software or portable device or internet or computer and they are now able to apply static, interactivity or motion design in different fields of design with what they learn about change of time and movement during flip book project, which is carried out entirely with traditional methods.

Also, the constantly changing technology can lead students to frequently use the ready tools and stop using their habits to transfer their ideas through drawing. The change of mental models of students influences them negatively in the design process. It has been observed that students have developed their skills in drawing, character development, basic motion picture creation, regardless of whether they create by using paper-pencil or in the digital environment with entertaining and creatives techniques such as flip book animation and that they have gained technically valuable benefits for courses involving advanced animation techniques for the rest of their education life.

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