



# New Trends and Issues Proceedings on Humanities and Social Sciences



Volume 5, Issue 6 (2018) 53-59

[www.prosoc.eu](http://www.prosoc.eu)

ISSN 2547-8818

Selected Paper of 7th World Conference on Design and Arts (WCDA 2018), 28-30 June 2018, BAU International Berlin  
University of Applied Sciences, Berlin – Germany

## Looking through the sphere; Illustration in virtual reality

**Seza Soyulucicek\***, Department of Graphic Design, Faculty of Fine Arts, Hacettepe University, 06800 Ankara,  
Turkey

### Suggested Citation:

Soyulucicek, S. (2018). Looking through the sphere; Illustration in virtual reality. *New Trends and Issues Proceedings on Humanities and Social Sciences*. [Online]. 5(6), pp 53-59. Available from: [www.prosoc.eu](http://www.prosoc.eu)

Selection and peer review under responsibility of Prof. Dr. Ayse Cakir Ilhan, Ankara University, Turkey

©2018 SciencePark Research, Organization & Counseling. All rights reserved.

---

### Abstract

Illustration field has developed different visual communication ways and reached a broad usage area. Instead of consisting of just book limning, with various techniques, methods and technological opportunities, it continues to take place in other places. Especially the usage area of two–three-dimensional illustrations on digital media enlarged, led to different production processes and designers found new display possibilities and design processes. One of the examples about this situation is 360-degree illustrations that can be designed and displayed on virtual reality (VR) media. VR is an interactional virtual media that can detect the location and movements of users, appeal to one or more artificial senses and give the feeling of being inside the simulation. 360-degree display and production on this media takes not only VR glasses but also web portals and some developer programs. In this study, illustration in VR and 360-degree panoramic illustration of display and development systems and production processes are examined.

**Keywords:** Illustration, virtual reality, panoramic illustration, graphic design, art education.

---

\* ADDRESS FOR CORRESPONDENCE: **Seza Soyulucicek**, Department of Graphic Design, Faculty of Fine Arts, Hacettepe University, 06800 Ankara, Turkey.

E-mail address: [seza@hacettepe.edu.tr](mailto:seza@hacettepe.edu.tr) / Tel.: +90-312-297-8825

## 1. Introduction

Humankind for centuries has been choosing face to face interaction in order to express a thought or give information. The term 'interaction' has changed its form in years with the development of new communication ways. Computer communications field has arrived as the digital age has begun. According to Cagiltay (2016), theoretical and practical works in the human-computer interaction field aim that information and communication technologies' products to be people and need oriented. A new interdisciplinary field, human factor, first appeared in the 1970s and spread with an increasing speed in 1990s and its popular piece 'human-computer interaction' works in order to do away with these problems to increase the amount. One of the main supporting fields for human-computer interaction is graphic design. In this study, illustration processes in virtual reality (VR) applications and their potential in the art education are examined.

## 2. Virtual reality

One of the human-computer interaction fields is VR. According to Craig, Sherman and Will (2009), when we speak about VR, we refer to a computer simulation that creates the real world, our physical environment and senses that are a reflection of the world. In order to convince the brain that it's a real world, the computer simulation monitors the user movements and adjusts the sensory display and indicators in a way to give the user a feeling of taking part in the simulation. To sum up, VR is a tool and simulation that enables users to physically take part in environments that are created in accordance with the real environments. VR is an interactional virtual environment that senses the location and movements of participants, interacts with artificial senses and gives the feeling of taking part in the simulation.

According to another definition, VR creates 3D environments using computers and enables users to interact in it. This interaction contains the ability to move and sense the 3D environment, using and directing the objects within the environment (Gutierrez, Vexo & Thalmann, 2008).

Humankind that in the recent information technologies is in a way regarded as 'techno-being' which creates dreams, artificial intelligence by designing a reality delusion in the developed virtual-cyber techno environments. VR substantially uses the concepts and techniques of surrealism as well. Surrealists that describe objects and environments in an extremely realistic way, changing the real physical conditions by using objects altogether, create fictions that give the feeling of a dream environment. While creating these fictions, they use main formal narration features such as 'space, viciousness, transparency, disorder and materialization' (Turker, 2005). It is inevitable to use computer technologies to digitally visualize the fictional place in a VR environment. Yet computers are the only tools to implement designs as the actual responsibility is of designers.

In order to give the users an appropriate VR experience, it takes some special equipment. These tools enable the creation of an alternative environment sense, providing the participants with a feeling of existing in another environment. For this experience, the user wears a head-mounted display that is right in front of the eyes. With sensing devices that monitor user movements, users can move the objects in the virtual place. Along with these, another VR experience is given by the display of images on screens that cover around the users. Just like the display system of an airplane simulator (Sherman & Craig, 2003).

One of the most important elements of VR is to sense the users' position. One can't create a VR without the sense of user location, movements and pointed/reached spots. With this user location detection called 'tracking', the VR system gives feedbacks to participants according to tracking data, by which an interaction comes to place.

Along with head-mounted displays, glasses in which mobile devices are placed can also be used to have a VR experience. Inside supporting tools such as Google Cardboard, a smartphone is placed and

the display image is divided into two for both eyes. In this way, smartphone movement sensors are used to create a VR experience.

VR consists of three different paradigms. The first of which is the placement of images in an environment. This paradigm doesn't contain any interaction but images surrounding the user's environment. The location and direction of the participant are taken into consideration and the participant feels within a ball. The second is head-based screens by which the system responses according to the movement of the user and the images. In this case, the user also motions sensor gloves. The third is hand-based screens which are a special example of hand-based paradigm. These screens give an alternative perspective for the VR. Unlike the other cases, the screen is in a hand-held shape.

VR, brought by technological developments, is a new environment, where a lot of experiences take place in order to find more effective ways of practical applications and interactions (Sherman & Craig, 2003). It consists of four key elements which are: Virtual world, immersion, sensory feedback and interaction. As it can be seen, it is an interdisciplinary application environment in which many different fields meet. In this study, it is stated and examined that we can create original designs with alternative techniques and approaches in a virtual world.

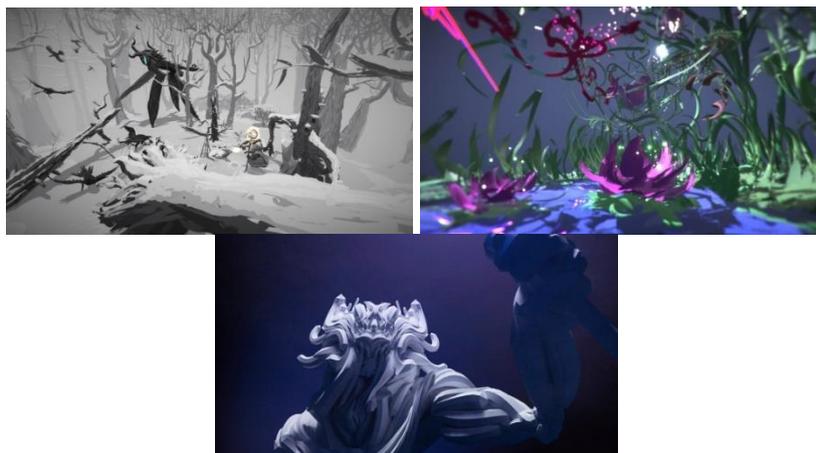
### **3. Drawing in virtual reality space**

VR enables users to interact in the designed fictional environments. With the foundation of VR, a new drawing technique of illustration in a virtual 3D platform has emerged. This drawing technology allows people to easily and intuitively draw on 3D platforms. The biggest advantage of being able to draw this way is to be able to have intuitional 3D drawings without the need of any complex software. In addition to this, it enables the designer to reflect their limitless imagination as if it is real. According to Brody and Hartman (2001), to be able to draw without feeling the gravity feels like drawing in a dreamy world where you can reflect the whole imagination.

The development of VR technologies enabled 3D drawings on virtual platforms, giving users the chance of intuitively drawing without the need of any experience. With the head-mounted screens, various VR painting tools have been released to the market. Within the scope of this technology, both artists and the audience can physically walk around in 3D drawings. Many studies are done concerning the technology behind this new drawing style. However, it is necessary to examine this technology from the viewpoint of art education as well.

VR illustration tool has first been introduced in a festival that took place in North America, being held by Kaleidoscope VR community which is composed of directors and technologists. In the festival where the best examples of VR were displayed, a Google product 'Tilt Brush' was also introduced. Tilt Brush has the characteristics of a scenario providing users with an alternative and creative thinking platform in the VR field. The plainest explanation of Tilt Brush is a virtual brush that enables 3D drawing in a VR platform. Introduced by Google with the motto 'the possibilities are endless' provides designers with new design practices. Tilt Brush and similar drawing tools can be regarded as new expression forms of illustration. In this application, designers have real-time drawings on a VR platform. This technology of a new brush-surface relation format that is used both in digital and traditional illustration techniques can be seen as a new supporting field of creativity. Users can create 3D figures using brush and pallet, walking around in a virtual platform.

Microsoft has made cooperation with designers to show the potential of the drawing tool Tilt Brush. Using this tool, designers created conceptual platforms utilizing light, colour, form, line and 3D to reflect their own imagination (Figure 1). The most interesting part of this application is that users can walk around within the drawings (<https://www.tiltbrush.com>).



**Figure 1. Respectively from left to right are the Tilt Brush works of Chain, Miss Led and Steve Teeple**

Tilt Brush and similar applications are seen recently among the hit applications of the art and technology association. The application can be seen to be beneficial for art education. Especially in order to provide the department of fine arts students with an alternative experience in the works of form, colour, sizing and composition, the advantages which this technique can provide need to be considered.

With the expansion of VR applications, different and new approaches and development processes have emerged in the world of art. VR in a way is the redesign of the reality. It is possible to alternatively create the platform with 2D illustrations in the creation process of the virtual world. What comes to mind when one mentions VR is generally a head-mounted screen. Mostly the displayed images are the ones that are created with 3D software. Yet, with an alternative and original approach, it is possible to create a VR experience using 2D illustrations. One of the best examples for that is the 360-degree panoramic illustration.

### **3.1. 360-degree panoramic illustration**

360-degree panoramic illustration is fundamentally based on creating panoramic displays. According to Benosman and Kang (2001), the history of panoramic illustration leads back to 1794s. The first examples of panoramic illustration took place in books, newspapers and magazines back then to provide people with a wider view of cities and nature. These wide displays enabled horizontal images to be perceived in 360 degree. The main purpose of panoramic illustrators is to recreate the real world realistically by making people believe the image which they see is real and completely surround them with images.

Panoramic images and VR platforms are created and produced with the same purpose as well. The main purpose is to surround the viewer with 360-degree images. However, in terms of the surrounding, VR not only makes use of horizontal perception but also vertical perception. That way, users are entirely left in a ball/cave.

The display of the VR images can be seen not only with VR glasses but also on web platforms. Users can have this experience using their mobile phones. As in the hand-based VR paradigm mentioned before, without needing any glass, users can see these images using their mobile phones with motion sensors. It gives them a feeling of looking through a window, opening to another world.

New methods and techniques are developed in order to increase the imagination of designers, enabling them to create an original and surreal virtual world. The main goal of creating 360-degree images is to fill inside a 3D ball because the participant looks through a ball in a VR platform. Just like

the separation of a world map, when the ball form is separated on a flat surface, the rectangle that comes up is the workplace of designers. That is called the *equirectangular image* (Figure 2). There are reference lines on this surface that forms a ball. When illustrations are made considering these lines and images which are filled inside a ball, an exact 360-degree panoramic image is created. Users can view the whole surfaces of the ball horizontally and vertically in VR.

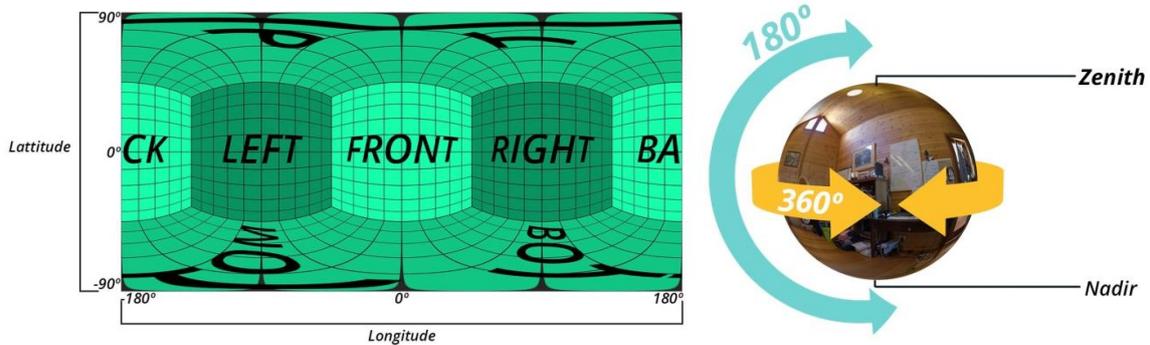


Figure 2. Equirectangular image ([http://stateofvr.com/?page\\_id=16864](http://stateofvr.com/?page_id=16864))

Creating 2D illustrations on such maps can lead to some issues. The biggest one of such problems is the mistakes in the distance between perspectives and objects when images are displayed in a ball. In order to prevent such issues, the necessity of real-time VR illustrations has come up and 3D feature to create panoramic images are added to Adobe Photoshop's CC version. Thus, designers can see how the images will be displayed in the VR platform while drawing on the map. Another way is to use Cubemap, by which one can draw on a map obtained from the separation of the ball. Finally, the images can be displayed, changing their Metadata or uploading them to 360-degree-supported web platforms.

To display the obtained illustrations, aforementioned hand-based VR technique can be used. Display systems consisting of art station, Kulla and similar web platforms enable drawings to be viewed in a VR application form (Figure 3). New generation mobile devices perceive user motions and display images accordingly.



Figure 3. 360-degree panoramic illustration (<https://kuula.co/post/7lg1h>)

### 3.2. Suggestions with regards to art education

VR in a way is the redesign of the reality. Designer's visual perception and plastic forming skills play a big role in the redesign process. Main purposes of the art education are to improve students'

designing skills and enable them to reflect their conceptual thinking on images originally. Students of the faculty of fine arts use new methods and techniques to create graphic forms, perceiving designing as a transformation process. In the art education, new technologies that respond to modern day requirements are made use of. Illustrations on VR platforms that are mentioned in this study can be said to be beneficial for the art education as an educational material. Especially using applications like Tilt Brush, students can explore how to reflect their conceptual thinking on lines and forms while physically taking place in a 3D platform. They can improve their line, plane, color, form and 3D creation skills of the graphic form design. In addition to this, these technologies can be beneficial for the development of basic skills and form abilities that are necessary for 3D because the designer works not on a 2D surface but in the platform that illustration takes place. That way, students can develop real-time expression ways of creativity.

A lot more experiments need to be made in order to determine the utility value of VR as an educational material. If the experiments prove the encouragement and effectiveness of VR, the whole curriculum of art schools and universities will need to be reviewed (Kayabasi, 2005). Even though VR doesn't yet take place in education, the potentials and outcomes need to be considered.

#### 4. Conclusion

We come across the graphic design field as the illustration art of thoughts and concepts. Just like the other fields, the graphic design field and education are substantially affected by the technological developments. Especially creative thinking platforms and practices in the illustration field change day by day. Illustration in VR comes up as a new art concept. In VR, artists find the chance to alternatively illustrate and present their conceptual thinking. In addition to the traditional and digital illustration techniques, being present within the drawing area requires new design methods for designers. The real-time display of 360-degree equirectangular images in VR platforms brought new design forms along.

In this age, art education is based on the cooperation of design, science and technology. Interdisciplinary is now inevitable in art education. To lead and increase student potentials to the right direction in seeing, perception, interpretation, design and creation fields, VR technologies in art education can be seen as an alternative. VR that in a way is experience, showing an unreal experience as real, provides students with a creative thinking platform. Along with the design of the created, imaginary and surreal environments, display ways by users also lead to different experiences as much as the design itself. Even though VR technologies are used as supporting materials in education, what's important is to develop original expression ways based on creativity.

#### References

- Benosman, R. & Kang, S. B. (2001). *Panoramic vision. Sensors, theory, and applications*. New York: Springer.
- Brody, A. W. & Hartman, C. (2001). Painting in space. In *Photonics West 2001-Electronic Imaging* (pp. 602–614). International Society for Optics and Photonics.
- Çagiltay, K. (2016). İnsan bilgisayar etkilesimi ve ogretim teknolojileri. In *Ogretim teknolojilerinin temelleri: Teoriler arastirmalar Egilimler* (pp. 297–314). Ankara, Turkey: Pegem Akademi.
- Craig, A. B., Sherman, W. R. & Will, J. D. (2009). *Developing virtual reality applications: Foundations of effective design*. Burlington, VT: Morgan Kaufmann Publishers.
- Gutierrez, M. A., Vexo, F. & Thalmann, D. (2008). *Stepping into virtual reality*. London: Springer.
- Kayabasi, Y. (2005). Sanal gerceklik ve egitim amacli kullanilmasi. *The Turkish Online Journal of Educational Technology*, 4(3), 151–158. .
- Sherman, W. R. & Craig, A. B. (2003). *Understanding virtual reality*. USA: Morgan Kaufmann Publishers.

Soylucicek, S. (2018). Looking through the sphere; Illustration in virtual reality. *New Trends and Issues Proceedings on Humanities and Social Sciences*. [Online]. 5(6), pp 53-59. Available from: [www.prosoc.eu](http://www.prosoc.eu)

Turker, I. H. (2005). Imgeden sanal gercege. *Anadolu Sanat Dergisi*, 16, 157–164. Retrieved from <https://www.tiltbrush.com>