MATERIAL EXPERIENCE THROUGH AUGMENTED REALITY IN INTERIOR ARCHITECTURE/DESIGN PRACTICE:
VIRTUAL STONE BUSINESS-TO-BUSINESS EVENT AS A CASE STUDY

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Master's Thesis

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ABSTRACT

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Master's Program in Design Studies

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Interior architecture/design practice highly relies on the experience of the user. Interior architects/designers are designing interiors not only to provide a safe, comfortable and functional living environment but also interiors that provide a unique experience is very crucial in the practice of interior architecture/design. In that sense, emerging digital technologies are offering new alternatives. This study aims to investigate the attitudes of the users in the means of Augmented Reality (AR) applications in relation with material experience. This research has been conducted through the augmented reality application of the Virtual Stone Business-to-Business Event of the Aegean Exporters's Association (Ege İhracatçılar Birliği, EIB). Because of the Covid 19 pandemic and travel limitation all around the world, last year EIB has decided to conduct a Virtual Stone Business-to-Business Event instead of a traditional face-to-face event. In this scope, Turkish marble companies meet Vietnamese clients on a digital platform and promote their product through a virtual fair software that was

specifically designed for this case. In this context, 15 participants have been reached for the research study. The model of the research has been designed as a qualitative method in which there are observations and interviews with open-ended questions. Phenomenological analysis has been used for the analysis of the collected data. It shows that although augmented reality offers new opportunities in interior architecture/design, it is still ineffective in the context of existing technologies, considering the perceived reality and experience.

Keywords: Augmented Reality, Virtual Reality, Interior Design, Virtual Fair

ÖZET

İÇMİMARİ PRATİKTE ARTIRILMIŞ GERÇEKLİK İLE MATERYAL DENEYİMİ:
VAKA ÇALIŞMASI OLARAK DOĞALTAŞ SANAL İKİLİ İŞ GÖRÜŞMELERİ ETKİNLİĞİ

Ceylan, D. Bahar

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İçmimarlık disiplini büyük ölçüde kullanıcının deneyimine dayanır. İç mekân tasarımı, yalnızca güvenli, konforlu ve işlevsel bir yaşam ortamı sağlamak değil aynı zamanda içmimari disiplini için çok kritik bir konu olan deneyim faktörü için de çok önemlidir. Bu doğrultuda gelişen dijital teknolojiler içmimarlar için yeni alternatifler sunmaktadır. Bu araştırmanın amacı, kullanıcıların malzeme deneyimiyle ilgili artırılmış gerçeklik uygulamaları açısından tutumlarını araştırmaktır. Bu araştırma, Ege İhracatçılar Birliği'nin gerçekleştirdiği Vietnam Sanal Ticaret Heyeti ile gerçekleştirilmiştir. COVID 19 pandemisi ve dünya çapında seyahat kısıtlaması nedeniyle, geçen yıl EIB geleneksel yüz yüze ikili iş görüşmeleri etkinliği yerine sanal bir etkinlik düzenlenmesi kararlaştırılmıştır. Bu kapsamda, Türk mermer firmaları Vietnamlı müşterilerle dijital platformda buluşmuş, ürünlerini bu durum için özel

olarak tasarlanmış sanal bir fuar yazılımı aracılığıyla tanıtmışlardır. Bu bağlamda, araştırılan çalışma için 15 katılımcıya ulaşılmıştır.
Araştırmanın modeli, açık uçlu sorularla mülakat ve gözlem metoduna dayanan nitel bir yöntem olarak tasarlanmıştır. Toplanan verilerin analizi için fenomenolojik analiz kullanılmıştır. Artırılmış gerçekliğin içmimari/tasarımda yeni fırsatlar sunmasına rağmen, algılanan gerçeklik ve deneyim göz önüne alındığında mevcut teknolojiler bağlamında hala etkisiz olduğunu göstermektedir.

Anahtar kelimeler: Arttırılmış Gerçeklik, Sanal Gerçeklik, İç Mimari, Sanal Fuar

DEDICATION

to My Family…

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I would like to present my kind appreciation to Prof. Dr. Özgen Osman Demirtaş with all my sincerity for his precious guidance, endless perspective, and constant support throughout the whole period of this research and my whole academic life.
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LIST OF ABBREVIATIONS

VR: Virtual Reality

AR: Augmented Reality

EIB: Ege İhracatçılar Birliği

CHAPTER 1: INTRODUCTION

1.1. Problem Definition

Interior architecture/design is the practice of creating healthier and aesthetically enhanced environments for the usage of the people. The practice itself consists of many elements like asking, imaging, planning, creating and improving (Yu-Shan et al., 2018). The very act of interior architecture/design practice feeds upon the visualization and the creativity of the designers. The nature of the practice, creates these requirements which actually evaluates and defines the value of its practitioners and their designs (Christiaans, 2002).

The visualization aspect of the creation is arguably the most important element of it when it comes to the interior architecture/design projects. Augmented Reality on the other hand, seems to shorten this visualization process and creates a more accurate depiction of the intended interior architecture/design. Placing virtual objects into the real environment helps in understanding spatial relationships and dimensions, required, for example in interior architecture/design, which is a prominent application area of AR (Siltanen, 2015).

The usages of the Augmented Reality (AR) are not discovered thoroughly and its usage are still limited and in the process of experimentation. Still, the new technological enabler, AR, hints many promising developments while its current usage in a few areas shows its worth and encourages the future advancements in its usage (Pile and Gura, 2014).

1.2. Scope of the Thesis

The main objective of the study is finding out the possible ways of the Augmented Reality usage in the practice of interior architecture/design, especially on the case of creative process.

Augmented Reality (AR) is already a research subject for a few decades. However, the usage of it is still far from being called a worldwide trend. Its undiscovered potential coupled with the fact that it is a quickly developing technology makes it one of the technological wonders of today. Nowadays the application of this technology can be

found even in mobile phones, but the professional usage of AR in the respected fields of the work life, still, could be called an uncharted territory. Hence, this thesis aims to explore the usage of Augmented Reality in the practice of interior architecture/design, while trying to analyze ways of improving this usage, lighting the way for the new research and creating a baseline for the probable future scenarios.

First, Interior architecture/design and Augmented Reality are defined and the possibilities of AR usage in interior architecture are discussed.

The thesis consists of 5 chapters. Chapter 1 is Introduction. In this chapter the background information, the problem definition, scope and the structure of the thesis are given. This chapter creates a basic understanding of the thesis while explaining the main motivations behind its purpose.

In Chapter 2, the interior architecture/design practice is defined with its history and its design process is explained. Also chapter 2 explains the importance of the visualization and visual presentation in interior architecture/design practice to pave the way for (below mentioned) chapter 2.

In chapter 3, Augmented Reality (AR) is defined while also giving the information about its application in many fields. The limitations of Augmented Reality and its usage is also mentioned in this chapter. Also the data and the definitions given in this chapter will be used in chapter 3.

In Chapter 4 possible usage of AR in interior architecture/design practice are discussed by elaborating the advantages and disadvantages of utilization of the related technology.

Chapter 5 is the research study. In this chapter, the usage of the AR in Interior architecture/design is considered through a case study.

This study aims to investigate the attitudes of the users in the means of AR applications in relation with material experience. This research has been conducted through the AR marble fair of the Aegean Exporters's Association (Ege İhracatçılar Birliği, EIB). Because of the Covid 19 pandemic and travel limitation all around the world, last year EIB has decided to conduct a virtual marble fair instead of a traditional face-to-face fair activity. In this scope, Turkish marble companies meet Vietnamese clients on a digital platform and promote their product through a virtual fair software that was specifically designed for this case. In this context, 15 participants have been reached

for the research study. The model of the research has been designed as a qualitative method in which there are observations and an interview with open-ended questions. Phenomenological analysis has been used for the analysis of the collected data.

In this chapter through phenomenological analysis the collected data are evaluated This chapter also contains themes, categories and codes that appear in line with the answers provided by the participants.

Last chapter is the Conclusion part, in which a general discussion and conclusion is given by mentioning the limitations of the study and also suggesting some recommendations for the future research.

To answer the following questions, the thesis uses phenomenological analysis to compare the obtained data in comparison with the existing knowledge acquired from the literature. Comparing the discussions of the previous research, the thesis aims to evaluate a conclusion by answering the following research questions:

- What are the possible usage areas of AR technologies in interior architecture/design?
- What are the benefits of AR usage in interior architecture/design?
- What are the attitudes of the users towards a virtual experience of an interior finishing?
- What are the emotions and perceptions of the users through virtual business-to-business event?

CHAPTER 2: INTERIOR ARCHITECTURE/DESIGN PRACTICE

2.1. Definition

The definition presented in here is filtered and molded from a few publicly acknowledged definitions to create a definition which satisfies the basic meaning behind the practice, that is; the art and science of practice or planning for achieving better living environments. This is the definition which will be used in this thesis for the upcoming terms of interior architecture/design. The interior architectures/designers are not just the decorators who simply chooses the furniture for the interior spaces and arranges them accordingly. Instead, now, the practice needs skilled profesionals who plan complex configurations and reconfigurations of interior space, determine lighting requirements, manage various construction trades and create interior spaces which are not only aesthetically more appealing but also life-enhancing (Pile and Gura, 2014; Savage and Friedmann, 2000).

2.2. History

The known history of civilization spans for thousands of years. So, when does the interior architecture/design has shown itself in this time frame? This question may not have a definitive answer as the borders of the interior architecture/design remains still vague, despite the definitions trying to nail it in one place (Inzerillo, 2013; Mealy, 2018). There are a number of factors which makes analyzing the interiors a tedious subject. They are usually not designed by one person for another person; consists of many objects; both the interiors and objects inside the interior are subjected to the continual usage and modifications and historical records of the interiors are pretty hard to retrieve, especially before the invention of photography (Lees- Maffei, 2008). This brings another question to the field which is pretty hard to answer: What is considered as a subject of interior architecture/design in history? Arnold A. Friedmann and George Savage (2000) claims that the art of interior architecture/design includes all of the fixed and movable objects which are an integral part of any human habitation. With a similar yet different approach, Mark Hinchman supports the idea that interior architecture/design history is based on “decorative arts” which is a field stood in-between of fine arts and crafts (Hinchman, 2013). The profession may have begun by

decorating with consideration for form and function; like in Ancient Egypt where the mud huts were decorated with vases, animal skin ornaments and simple furniture (Ayuba, Kolo and Ofiedane, 2018).

As the complexity of interior architecture/design and the use of interior space advanced, the term “decorative arts” became inadequate. It evolved from the earlier “Arts and Crafts” to the latecomer “decorative arts” and finally to the new and modern term “design”. As humanity moved to the indoors without the need of survival as the most prominent function of sheltering, its need for their space transformed. Once a necessity, became a luxury that brought the complexity to the interior spaces. From stones inside the prehistoric caves to the Greek amphitheaters to Roman baths and arches, to the Ancient Egypt “soul houses” and Ancient Indian Temples; from far West to the far East and Islamic to the Christian without excluding the Renaissance, Gothic, Colonial; the history of interior architecture/design shows its variant styles which comes together with the knowledge of humanity’s need for the different usage of its space inside their habitable environments (Pile and Gura, 2014). However, the professional practice of interior architecture/design, which started as interior decorating can be traced to the mid to late 19th century. Elsie de Wolfe, an American actress, considered as one the first acknowledged interior decorators who lived between the years 1865-1950 (Less-Maffei, 2006). As the industrial development of the 19th century created a wealthier environment impregnated with the newly flourishing companies and policies; the subject of interior decorating became an opportunity for furniture companie to become international franchises with the services of furnishing the houses in many styles. It was still not an independent field for amateur designers to bloom and show themselves, but it pave the way for their profession and created the opportunity for the embarking of the new and independent interior architecture/designers which showed themselves while demolishing the earlier business style of interior architecture/design and decoration at the middle of the 20th century. Interior architecture/design freed itself from the claws of the industrial companie and reborn with the new identity of independent interior architecture/designers (Edwards, 2019).

21st century is the time when the interior architecture/design broke its shackles and became a timeline which presented a suitable environment for interior architecture/designers to freely express themselves in many ways possible. This

freedom created variant styles which in turn affected many other professional interior architecture/design practitioners to pursue their own touch in this professionally acknowledged field. Even though the number of styles became astronomical because of the touch of individuality expressed by thousands of new designers, some styles remained as the pioneer and the baseline of many inspirations. There is also one key element “sustainability” which cannot be forgotten when it comes to analyze the 21st century interior architecture/design. This trend affected many fields across the globe and interior architecture/design was not excluded from this massive alteration. The advancement of the technology in the new century, created many new ways and opportunities for interior architecture/design to flourish. With the new computer technologies, modeling programs and new applications, interior architecture/design has reached a new level that was previously not possible to consider.

Augmented Reality (AR) which is the main subject of this thesis is one of these technologies mentioned to be groundbreaking for the field of interior architecture/design. However, detailed information about the subject and its study will be given in the upcoming 3rd and 4th chapters of the thesis. The arrival of the new century, while bringing new opportunities, also brings new requirements for interior architecture/designers. Once the job of a basic craftsman, crowned with a professional definition. This definition included, an adequate education, ethics, legal recognition, jurisdictional boundaries of knowledge and skills (Abbot, 1988).

CHAPTER 3: AUGMENTED REALITY

The application of new technologies to pre existing fields of study provides a means through which advancements can be made in various fields. In terms of digital technologies, perhaps one of the newest technologıes with the greatest widespread potential for application is augmented reality (AR). Augmented reality refers to a technology in which computer graphics are overlaid onto real world structures and items, allowing the individual to see both what is and what could be (BiHinghurst, 2004).

There is an ongoing confusion between AR and VR, however there is a marked difference between the two technologies. VR places the user into a wholly computer generated or computer simulated environment, while AR uses the current environment as the foundation for the generated content (Schmaistieg and Hollerer, 2017). In this manner, AR can be used to fill the gaps between the real world and the virtual world through their integration in the user"s perception, either as viewed through a computer screen or through a pair of goggles that allow the user to view the space in real time (Schmaistieg and Hollerer, 2017).

As the application of AR within the context of this thesis is to the areas of interior architecture/design, the focus of the application of AR explored is focused solely on the visual applications of the technology.

3.1. A Definition of Augmented Reality (AR)

Azuma (1997) defines AR as a variation of virtual environments, complimenting reality instead of replacing it. There are three main characteristics of AR:

a) it must combine the real with the virtual,

b) it must be interactive in real time, and

c) it must be registered as three dimensional (Azuma, 1997: 36).

This definition does not rely on a specific output device, ensuring the broadest possible application to the technology, not the hardware or software used in the manifestation of that technology. AR requires both real time controls and spatial registration

(Schmaistieg and Hollerer, 2017). The primary focus of AR is visual integration, though auditory integration is possible as well (Garcia and Teston, 2018).

According to Schmalsteig and Hollerer (2017), the complete AR system requires four primary components: a tracking component, registration of items, a visual component, and a spatial model. Environment tracking is a crucial process of AR technology as it provides a means of exploring the layout of the current space in real time; the program must be able to identify and register each of the different design aspects as they are, not as they were at the time of initial scanning. Throughout a renovation, walls will change, objects will move, and the interior architecture/designer who chooses to use AR technology during the process must be able to have a current map of the environmental context, making environmental tracking a crucial part of the technology. The integration of a tracking component allows the user to achieve the most realistic results possible (Bostanci et al., 2012).

The second component, registration of items, refers to the process by which Computer generated items are registered within the field of vision based upon the location being tracked in real time by the environment tracker. This means that if the Computer generated item selected by the interior architecture/designer is a system of wall cabinets, the environment tracker is used in real time to identify the location of the wall in question, position those cabinets generated with the registration of items, and overlay the cabinet on the wall in the visual sphere, allowing the interior architecture/designer to see how the selected choice goes with the rest of the items or objects already in place, either in reality or in the virtual design. The visual component is self-explanatory, providing the projection of the AR on the reality through the use of a Computer, either in screen form, such as on a tablet, cell phone, laptop, or personal Computer, or in the form of AR goggles, where in the designer places those goggles over her/his eyes and the overlay is displayed in real time as the individual looks through the glasses over the space associated with the design process. The final aspect is the spatial model; this ensures that the generated image aligns with the real world image, and that depths and dimensions are accurate, allowing for accumulation of data that can be applied effectively within a real world context (Schmalsteig and Hollerer, 2017).

3.2. VR Versus AR

While the differences between virtual reality (VR) and augmented reality (AR) were touched upon briefly within the previous section as it pertained to the definition of AR, a broader exploration to illuminate these variations is necessary due to the manner in which these very different terms are often used interchangeably. VR refers to a computer-generated simulation, one created solely through the use of software, that allows the user to experience a simulated reality by enclosing the user's ears and eyes in a headset that projects simulated audio and visual cues (Augment, 2015). The concept of VR was first described in the 1950s and the late 1980s has seen the first applications of the technology (Inzerillo, 2013).

VR devices have played a significant role in achieving the AR experiences of today. In order to understand the relationship between VR and AR, it is first necessary to understand the hardware components that go into the creation of a successful VR experience. VR input devices include joysticks, keyboards, and trackballs, all of which provide the user with the ability to communicate with and interact with the virtual environment. Bend-sensing gloves have been used as a means of capturing hand movements, allowing for the detection of finger movements, posture, gestures, and other body language aspects that can be translated through software into commands that allow the user to interact with the virtual environment and translate the user's movements within that virtual environment. Multidirectional treadmills allow for further interaction within the physical space, allowing the software to record the user's movement without resulting in potential detriment to the user's person, ensuring that he or she stays relatively stationary while still being able to virtually move within the simulated environment. In addition to these input devices, output devices are also used to increase the immersion of the user within the virtual environment, including speakers, headphones or headsets, and pressure devices within the gloves or special suit worn in addition to the goggles or headpiece that allow the user to feel a corresponding sensation when interacting with virtual items (Inzerillo, 2013).

While there is an extensive body of literature on the use of VR within academic research, due to the relatively recent integration of AR technologies, there is a decreased amount of literatüre available on AR (Antoniac, 2005; Inzerillo, 2013; Abboud, 2014; Garner, 2017; Mealy, 2018). However, it is still possible to explore the relationship between AR and VR and identify the ways in which they are similar

and different. The primary difference between the two is that while VR allows for a digital recreation of a given environment, AR combines virtual elements within the real environment, displaying both in real time (Augment, 2015).

From a technological point of view, AR and VR utilize similar types of systems and both have great potential within a lot of different industries. More and more products and applications are being developed by leading technology companies, and real time applications of both are starting to be seen in entertainment devices, like Pokemon Go and researchers are starting to explore the applications of both within the medical field (Chavan, 2016). AR and VR are distinguished by their respective features. AR provides a means of enhancing the current reality through the addition of virtual elements, while VR creates a completely different virtual world. AR requires a designated environment for each AR session, though that environment does not have to be the same from one session to the next. Smartphones and tablets are the primary medium for AR use within the current applications of the technology. VR, on the other hand, requires that the user obtain and apply a device that allows for complete isolation from the real world. While AR is becoming increasingly popular within the marketing field, and while VR has previously been primarily used in video games and other entertainment options (Chavan, 2016), AR has become a tool previously only hypothesized in science fiction that has applications ranging from manufacturing to design, and spanning the entirety of the industries, including entertainment, in which technology already plays a part (Buttner et al., 2017; Liu et al., 2016; Palmarini et al., 2018). Headsets now exist that project AR overlays onto the visual field of the user in real time, providing instructions, specifications, dimensions, and allowing the user to see how the current space and items therein can go from their current State (A) to the desired State (B), regardless of whether that State is going from disassembled to assembled or giving a projection of what could be (Buttner et al., 2017; Liu et al., 2016; Palmarini et al., 2018).

3.3. Applications of Augmented Reality

The possible Augmented Reality applications are unlimited but early applications focused on games and other entertainment fields (Perdue, 2019). Early applications worked with the stationary desktop computers and users had to wear Head Mounted Displays (Schmalstieg et al., 2010). Recently, AR applications started to experience

on phones. According to Craig (2016), a successful AR application should solve a problem or it should make life easier with specific features. Moreover, it should provide an experience that users will not experience otherwise. Some of the AR applications are as follows:

Education

Traditional education methods depend on books and teachers must practice them in the real world (Wei et al., 2015). However, today this learning method can be considered as monotonous for the new generations. AR applications can be a part of a Standard curriculum, so students can contribute to educational simulations with their own devices (Chavan, 2016). Also, it has an impact on student's motivation (Wei et al., 2015).

As a good example; "Civilisations AR" is BBC's first AR application for education purposes. It presents more than 40 historic artifacts and users can easily see these pieces without going to museums. Moreover, they can also look over the x-ray views and narrations (Smith, 2019).

Figure 3.1. Civilisatıons AR (Smith, 2019)

Another good example of the utilization of AR in education is Froggipedia that is an educational application for individuals who don't want to dissect a real frog for science classes. The users can see a transparent view of a living frog and they can explore the lifecycle of a frog with digital simulation (Jensen, 2019).

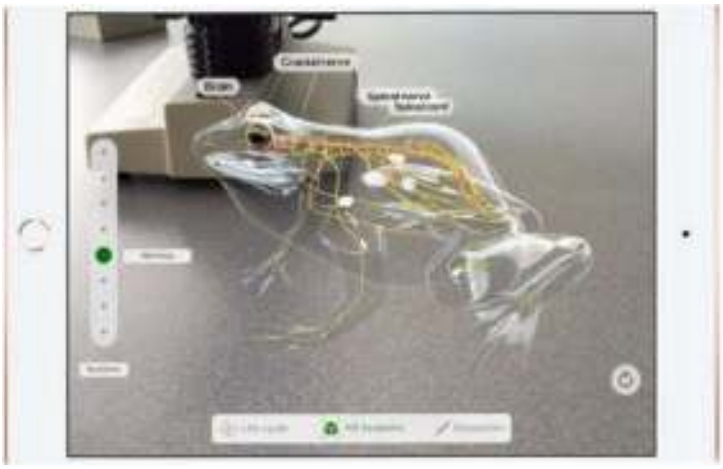

Figure 3.2. Froggipedia App (Jensen, 2019)

Manufacturing

Manufacturing applıcations of AR is a strong and growing area. In many industries, AR is becoming an important part of the prototyping process. Complex problems can be easily identified at tje early stages of manufacturing by the help for AR. Also, an effective simulation before manufacturing can eliminate many unexpected complications (Nee and Ong, 2013).

One of a good example is the application developed by Porsche, Porsche Production 4.0. Porsche is using AR in the manufacturing process to take quality control to the next level. The company's quality center makes experiments to find out if the technology can be used to obtain precise design information about components. Engineers can solve the potential problems immediately with using AR tools (Vyas, 2018).

Figure 3.3. Manufacturing with Augmented Reality (Vyas, 2018).

Retail Market

AR integrates the user environment with digital information in real time. Enhanced customer experience and the increase in retail sale stimulates the demand of AR.

As an example, the company of Harley Davidson developed an application that can be used with AR. Their customers can change the motorcycle's paint and they can add accessories with the AR application (Vyas, 2018).

Figure 3.4. Augmented Reality in Retail Market (Vyas, 2018).

Medical

AR technology can decrease the risk of a surgery with high-level sensory system. Medical students can practice with the AR technology, so they can get experience without risking the patients. Besides, MRI and X-ray Systems can be integrated with the AR technology (Chavan, 2016).

As a good example; Anatomy 4D is possible to learn all kinds of anatomical information, such as vascular, reproductive system or skeletal system in the human body, through the three-dimensional visuals available in the application. It will be easier for students to learn human anatomy with 3D visuals in AR instead of models. After downloading the application, a three-dimensional image of AR is displayed by displaying the corresponding marker on the camera screen that opens (Anatomy4D, 2018).

Figure 3.5. Anatomy 4D Application Experience (Anatomy4D, 2018).

Advertisement

The general purpose of the advertising industry is to introduce consumers to products. Consumers must realize that the product exists and they remember the details about the view. In that point, AR can be beneficial because it provides extended sensory capabilities and communication opportunities. This technology can be applied to magazines, newspapers, brochures, and catalogs (Connoly et al., 2010).

One of the good examples of AR usage in advertisement world is by Coca Cola. In 2011 Coca Cola Company designed an area with AR technology to take the attention to environmental awareness and rise funds for the environment.

Figure 3.6. Artic Home (The Coca Cola Company, 2011)

Navigation

AR can be useful in transportation. If users integrate their phone camera with the GPS, they can see the route över the live view. It creates an easy driving experience however, it may distract the driver (Perdue, 2019).

As a good example; Night Sky created using AR technology, is a virtual rainbow that aims to learn about occurs in the sky. It offers the opportunity to instantly track the movements of satellites, constellations, planets and stars, including the international space station, and to take a closer look at each object in the solar system. It helps users learn about what the surrounding sky is. If users want to, they can also monitor the sky events that occur in another location, except where they are. Provides an impressive and comprehensive guide to viewers with the help of 3D visuals (Küstür, 2016).

Figure 3.7. Astronomical Image From The Night Sky App (Jones, 2014).

3.4. Limitations of Augmented Reality (AR)

As the biggest limitation of AR technology, is its vulnerability to outdoor conditions, since different environmental conditions can disrupt the effectiveness of the AR system. Examples of these environmental conditions include wind, rain, excessive air temperature or excessive loss. In addition, AR content can sometimes be incompatible with the position in the real environment. (Höllerer and Feiner, 2004). In increased reality, many connectors, such as the universal serial bus (USB) connector, are not

sufficiently robust for outdoor use, but are susceptible to breakage (Azuma et al., 2001).

AR technology; stereo image, high resolution, color depth, brightness, it can experience technical problems such as contrast, field of view, and depth of focus. However, people who use AR technology have problems with social acceptance. For example, it can be described as inattentive and privacy concerns to the use of AR devices. (Van Krevelen and Poelman, 2007). Researchers have insufficient knowledge of the user interface design through AR technology, where three-dimensional interaction with the environment is provided. (Gervautz and Schmalstieg, 2012).

AR technology is not sufficient to meet needs in terms of durability and reliability. However, AR glasses should be more ergonomic and effective. In addition, more content tools must be developed for AR (Palmarini et al., 2018). AR hardware should be small, light, easy to carry and capable of displaying images quickly. In addition, the battery of AR devices is a significant limitation. (Mekni and Lemieux, 2014).

Although Google and Apple brands stand out in the field of AR on mobile, AR technology is now in a very backward position in terms of competence. Except for mobile AR, the consumer market is almost as small as nothing. As of now, only a handful of companies are producing AR devices for the consumer market. In the AR industry, there are very few companies competing by offering products with low, medium, high price ranges. These companies often supply their products for businesses (Mealy, 2018).

CHAPTER 4: AUGMENTED REALITY (AR) USAGE IN INTERIOR ARCHITECTURE/DESIGN PRACTICE

While applications developed with AR technology are most available in training and entertainment, interior architecture/design, manufacturing, design, marketing, visualization, other areas such as military, sports, tourism, medicine are also affected (Kipper and Rampolla, 2013; Azuma, 1997: Billinghurst, Adrian, and Lee, 2014; İçten, and Bal, 2017; Siltanen, 2012; Antoniac, 2005; Chatzopoulos, et.al., 2017; Klinker, Stricker, and Reiners, 2001; Alkhamisi, and Monowar, 2013).

İnterior architecture/design is the art of designing and building esthetics with esthetic creativity, linking the necessary spaces, functional requirements with economic and technical facilities to make people easier to live and continue their activities, such as housing, rest, work, entertainment and more (Hasol, 2016). Using a parallel approach with interior architecture/design practice, the use of AR in interior architecture/design increases with the development of technology.

4.1. Current Usages of Augmented Reality in Interior Architecture/Design Practice

The design defines the first draft of an artwork, structure, or technical product as design (Abboud, 2014). In other words, the design is a production event that extends from traditional everyday objects, furniture, interior architecture/design, landscape to urban planning and aims to bring an esthetic fit to the environment based on human creativity (Hasol, 2016). The general act of interior architecture/design is to examine the specific parameters such as user and usage requirements in detail and propose good intertior solutions. Design study can be discussed under two main topics: "Schematic design" and "design development". Sketches and pre-projects are prepared, taking into account the analysis and requirements required in the schematic design (context, integrity, material and construction, function). The preliminary project is presented to the customer in various architectural expressions (physical models, 2D and 3D drawings, etc.). In the development of the design, the implementation project is being prepared, taking into consideration the corrections on the project. Many different disciplines need to be intervened in the process of preparing an implementation project.

The success of a design can be mentioned as depending on the quality of the analysis, coordination of collaboration between disciplines, and good expression by the project owner. As an interior architecture/design expression method, AR can contribute significantly to the success of design. In the design phase, the use of AR can be summarized as:

- A variety of solutions have been developed in AR platforms to coordinate designers or experts engaged in a project in the design studio. One of these solutions is the AR collaborative platform "Shared Design Space". The Shared Design Space system consists of four ceilings, a projection wall and a large "live" and interactive table. Users can interact with virtual objects (3D Model, drawing, etc.) by sitting around the table with their own computers or drawings and using digital pens. Users are viewed virtual data on real paper, which is the marker on the table, with digital pens. Through a centralized system and a radio network, virtual data can be transferred from computers to the table, so that the model can be revised simultaneously, and the projection is displayed on the wall. AR is not only available in a studio but also in the field. The designer is in direct contact with the work area and can offer more accurate analysis and design options (Abboud, 2014).

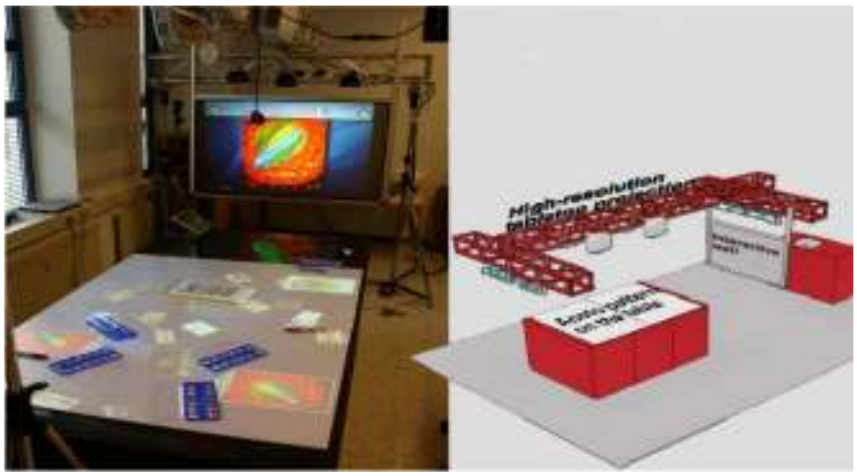

Figure 4.1. Shared Design Space System (Haller, et.al., 2006)

- It is intended to visualize a portion or an object of a full-scale structure in place, and to visualize a part or an object of the structure at a location and full-scale for the detection of collision points. These applications are better suited for

interior architecture/design or renovation. Projects ıt can also be detected if objects are seated at full scale and there is a collision or conflict problem with actual objects in place. (Abboud, 2014).

Figure 4.2. Use of AR in interior design (Abboud, 2014, p 11).

- To obtain a construction dimension: In some cases, AR can replace Totalstation or other measuring tools in terms of system accuracy and tracking system. (Quintal, 2017). The mobile phone can be used as a high accuracy measuring tape with the AR measure (Figure 4.2.) application. (Quintal, 2017). With the same logic, the Magic plan application (Figure 4.2) aims to quickly measure the space and create the plan without using any other tool. The system, which is routed from the interface screen with the application input to the camera, starts to create the plan by holding the coordinate axis to any desired corner. When the corner points are focused, the point changes direction by clicking on the screen. The grid system, which occurs at each corner point, only detects the distance from that corner to the next corner. So it's based on the corners, connecting the linear walls and creating the plan. A combination of plans created by the site allows the user to easily create the entire plan (Gür, 2014).

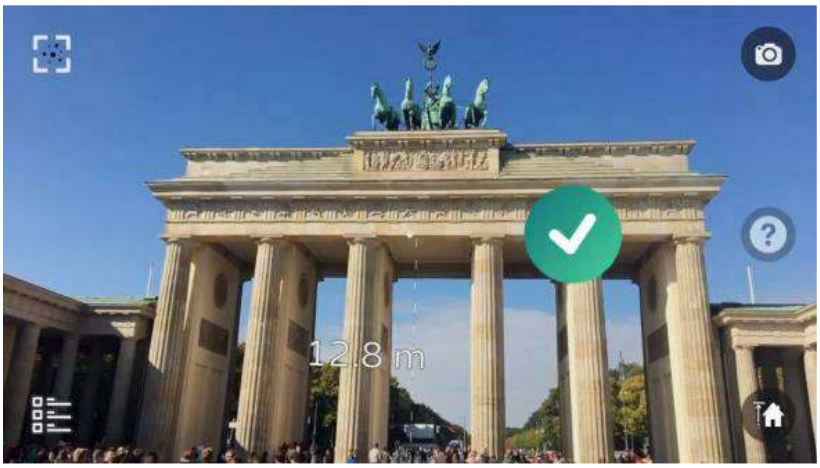

Figure 4.3. AR Measure (Product Hunt, 2017)

Figure 4.4. Magic plan (Gür, 2014: 25).

Although the idea of using AR technologies in education is common and appeals to researchers, it is a new idea to use and research the AR in interior architecture design. Therefore, the scientific studies on this subject have been conducted in a limited amount of literature (Antoniac, 2005; Inzerillo, 2013; Abboud, 2014; Garner, 2017; Mealy, 2018). Today, AR technologies, which are used in many different industries, also have dozens of applications developed for interior architecture/ design. However, it would be fair to say that most of these applications are used as commercial or professional assistants. AR has yet to find enough space in the culture of interior

architecture/design. In addition to the commonly used AR, traditional methods are adopted today as the system and tools of the design studio.

When the potential of AR technologies is used correctly, it is clear that their contribution to the interior/architecture design will be significant. Easy to integrate into the studio environment, hardware and software features are design tools that can be accessed by any segment with easy portability and clear interfaces. This technology has been tried to provide information on how to use existing interior architectural applications in the design studio, with limited use cases in the interior architecture/design today.

4.2. Benefits of the Augmented Reality usage in Interior Architecture/Design Practice

It is important to discuss the benefits of using AR technologies in the interior architecture/design, which we can now characterize as a high potential for development of the profession. Table 4.1. demonstrates the benefits under several categories (Gülel and Arabacıoğlu 2019).

Table 4.1. Use and benefits of AR technologies in the interior architecture/design

INTERIOR ARCHITECTURE/ DESİGN	THE BENEFITS OF AR APPLICATIONS IN THE DESIGN STUDIO	AR TECHNOLOGIES USAGE
Collaboration	● Supports Group Operation. ● Facilitates İnterpersonal Communication. ● Supports 'Learning By Doing'. ● Provides Guidance During Physical Applications.	● Digital glasses, Hololens, Through Google glass, inter-group communication provided, orientations provided.
Information Access	● It Enriches Theoretical Knowledge ● Enhances Printed Material ● Provides Easy And Effective Access To İnformation ● Redirects To The Relevant Website ● Helps Establish İnterconcept Bonding ● It Personalizes Learning.	Digital glasses, Hololens, Google glass, Digital contact lens, tablet, smartphone theoretical knowledge through he gets rich, he gets personal, information is easier to access.
Field Trip	● Allows to see virtual design in physical environment ● It's been enriched on field trips provides access to information	Tablet, smartphone design through the trips that took the studio it makes it productive.
Desıgn Process	● Allows to develop ideas in sketches and problem solving phases ● Alternative helps improve ● Saves time and material	Tablet, smartphone, design through the pointer problem resolution process it contributes positively.
Presentatıon Techniques	● Photorealistic presentation, ● Interactive presentation technique, ● Easy sharing of the presentation, ● Realistic material representation, ● Easy to the physical environment of the studio adapts.	Tablet, smartphone, monitor, via pointer Design presentation techniques supports.

Creative Process, Visualization and Modification

Visidraft, SketchUp, InSiteVR, kind applications are design visualization applications. These are applications that can be guided by BIM platforms. They are used for the purpose of converting 2D design output to 3D and AR modeling at any time. For example, with cameras from smart devices, the user can perform practical operations. By placing applications and virtual objects in the design area, the positioning of all items that can be processed in the field relative to each other can be observed (Sampaio, 2018). While Visidraft is compatible with AutoCAD, Revit, and 3DS Max platforms, SketchUp is compatible with Nemetschek Vectorworks and ArchiCAD platforms. From project design to building life completion, they continue to use.

Visidraft

Visidraft software has developed its own name-bearing application to enable it to see other elements such as building products and conversions in the 3D CAD model. The application can be synchronized with AutoCAD, Revit and 3DS Max platforms of Autodesk, as well as Trimble's SketchUp, Nemetschek Vectorworks and Graphisoft's ArchiCAD models. It can also be applied to different data outputs. There are different levels of personal customization options. (Chandarana et al., 2013). It is one of the most common application tools of AR used in the interior architecture/design industry. Visidraft offers 4D design models around the beneficiary. Figure 4.5. illustrates how to model the features that are placed in the field with Visidraft. When the user positions virtual images, Visidraft calculates the distances between all objects in the target area as autonomous and works in line with Visidraft; Revit, ArchiCAD, and Nemetschek Vectorworks, Bentley software plug-ins within the location. (Visidraft, 2018). Revit from these tools is software that allows 3D-4D parametric object-based design through parametric modeling. With Revit-like platforms running on the Windows operating system, the floor plans, heights, design subsections, and 3-dimensional views can be updated and revised automatically. These processes do not require changes to the entire design from the beginning, as in traditional methods.

Figure 4.5. Design model with Visidraft (Visidraft, 2018 p:11).

SmartReality

It's another software developed for the interior architecture/design industry. Works in accordance with REVIT-like 4D BIM (Building Information Modeling) platforms. Designed 2D studies can be used in conjunction with a smartphone or tablet. Oculus Rift is used to simulate designs with Epson, HTC type HMD devices and AR headsets. The software produces effective solutions for developing simulations with smart mobile devices, in short, from project printouts on paper media. (Figure 4.6.) SmartReality works with Google Project scanning software. Allows interaction with headphone and microphone and audio instructions during use with the Leap Motion app for Oculus Rift AR. The application, which is functional on the BIM platforms, also allows simulated monitoring of the work to be carried out by the project in order of construction of parts of the lean structure to be examined. Applications such as SmartReality can be used by engineers and architects, such as OrthoGraph, Pair 3D, when creating 3D models in any user 2D plan. Identifying visual and presentation gives applications on other components from the theme. (SmartReality, 2018).

Figure 4.6. Example of a Smartreality AR Application (SmartReality, 2018).

AR Sketchwalk

Application that develops AR simulation over 2D outputs of a design being studied. It has functional features such as impression on the project, development tracking. In the application example shown in Figure 4.7, the 2D project output data is simulated using the smart device. In the application instance, 3D images can be added on 2D data, making design details more clear.

Mobile smart devices allow tracking of project complex areas at more intensive scales, by allowing intersections to be displacements. It is possible to use it in training, in adaptation studies for occupational health and safety, in marketing-like functions. (nbww, 2019).

Figure 4.7. AR Sketchwalk Interior Architectural/Design Application Example (nbww, 2019).

Wakingapp

With Wakingapp, both VR and AR technologies can be implemented. The application is useful for creating content with AR, VR, and holograms. Figure 4.8 includes a design example that is being developed with Wakingapp. The importance of the application allows any business without experience of software knowledge to acquire AR-VR images within a short period of time. The software is also an add-in software and can convert 3D models in as little as 30 minutes.

Figure 4.8. Example of AR Design (Wakingapp, 2019).

4.3. Disadvantages of the Augmented Reality Usage in Interior Architecture/Design Practice

AR is an innovation that provides development in interior architecture/design as well as in many areas. Although the AR, which we discussed under the previous topics, has many ways to offer its current working principle it also has characteristics that reduce the performance of the system. The first is that tablets or smartphones need to be kept at all times. The transport of sensitive devices in long-term use is becoming difficult when resistance is low in the face of external factors such as breakage, impact, water, etc. These hardware and devices, made of hard material, are also at the bottom of the line for space adaptation. Another negative feature of these features is that they have limited visibility. The size of the screens is limited to a certain size, given the ease of transport due to its inflexible construction. This means only watching the angles of view that enrich the real environment from a small frame. (Van Krevelen and Poelman, 2007).

It is clear that system efficiency will increase with AR applications that can work with the flexible, foldable, capable displays to be developed and can be adjusted to the desired size. A borderless, lightweight display can increase visibility and enhance reality perception by minimizing the boundaries between the physical environment and the virtual object. A screen made with flexible, foldable material will be easy to adapt to any surface, while its lightweight shape and portability will be easy.

Another negative feature that makes it difficult to use today's AR systems in the interior architecture/design is the identification of each component of the interior. There are many components in an interior architecture/design, and for pointer-based worker AR applications, each of these components needs to be identified with different markers. This can cause the system to slow down. In AR technologies, where uninterrupted operation of the link between the pointer-camera-processor is important, the system's slowness reduces ease of use. In addition, limitations in the reading distance of the camera that sees the pointer are one of the reasons that the system is interrupted. The solution can be found by developing the easy way to introduce identification technologies to the system, which is unmarked, the existing components of the space. With a tracking system that identifies the characteristic of the venue, the replacement of common applications with the help of today's markers will make it easier to use in complex areas. (Van Krevelen and Poelman, 2007).

The 3-dimensional models available in the 'ready model library' of AR applications are limited. This is another limitation that designers face in the process of designing by AR applications. By using new methods to support the use of a virtual object that is not in the pool, the user will scan any object that they see in 3 dimensions and then put it into the object warehouse, making changes will provide a foundation for wealth in all of the designs. In this context, today's 3-dimensional scanners seem to respond to this need. Scanning of any 3-dimensional object is performed with the mobile scanner named 'Structure Sensor', however, it is predictable that the process of scanning will be resolved within the AR application without the need of any 3-dimensional scanners, which will increase the speed of the process.

4.4. Components of AR Experinece

The AR experience consists of the following components (Karatay, 2015: 41):

- The application of augmented reality
- Technology
- Contents
- Physical world

- Interaction
- Participants

Augmented Reality applications: AR applications are an application that enables the creation of information in conjunction with virtual content from the real world and allows the user to interact in this environment (Uzbek and Ünüsan, 2018). An augm AR ented reality application can be made up of simple structure, as well as support structure with different levels of complexity. The AR application is interacting with various screens, sensors and devices used within the AR experience. The technology-based software and software components that enable the user to experience AR through this interaction (Karatay, 2015).

Content: Content is the factor that determines how AR applications are presented in which virtual or physical environments. Content is one of the most critical elements in an AR application. The application directly interacts with the presentation of the content. The saturation and richness of content increases the impact and quality of the AR experience (Karatay, 2015). Depending on the content, the user also chooses which interaction mode to use (a public place, museum, library, etc.) (Furth and Carmigniani, 2011).

Interaction: AR is expressed in the form of technology where real-world and virtual images are combined, simultaneous interaction between virtual and real objects (Yılmaz, 2014). Each AR experience should interact with its structure reputation. The interaction of the physical world and virtual world thanks to AR allows participants to view and perceive the world from a different perspective. Participants can experience AR through physical gestures by giving commands, pressing buttons, or performing any number of different actions. With the features of interaction, AR can be transformed into custom applications. This is a key reason for businesses to use AR technologies (Karatay, 2015).

Technology: AR implementation is technology in infrastructure. Each AR application includes hardware such as a screen to experience sensors, processors and virtual experiences that will be provided through the integration of the virtual and real world (Tuncay, 2018).

Physical World: An AR experience is experienced by the user masses who live their lives in physical environments. The physical world is an environment that also conforms to usage differences. The AR experience can be performed in a real physical environment, as well as in special environments where AR is experienced. Specially created environments may be themed as representations of the real world (Karatay, 2015). This technology enriches the real world environment with the help of virtual elements. Therefore, the real world is a must for AR application (Tuncay, 2018).

Participants: Audience are the participants in an AR experience. An AR experience with no attendees is not possible. The AR experience is designed to experience the output produced by the participants with the interactive and interoperable operation of all specified factors. All physical movements, activities and actions of the participant affect how the system responds (Karatay, 2015).

4.5. AR Experience

Experience marketing is important for today's consumers who desire the experience of life. This importance is more than the rational benefit of the product or service, but also the satisfaction and pleasure from the experience in consumption. In this context, the experiential marketing factor is a phenomenon that gives consumers pleasure for the purpose of gaining loyalty to the product, service or brand, but also addresses five senses, such as sight, hearing, smell, feeling and hearing, and is standing on values that can make consumers happy (Küçüksaraç and Sayımer, 2016).

Detailed information about strategic experience modules has been discussed under the below topics.

4.5.1. Sensory Experience

The concept of sensory experience refers to the type of experience that addresses five senses (Ekici, 2012) and refers to the creation of perceptions of consumers through their visual, tactile, auditory, sweet and odorical senses. In this context, sensory marketing can differentiate in the market by creating attraction and attraction in customers sensually. Use of sensory stimuli in campaigns can both differentiate and offer incentives for customers to try and buy. With unique experiences from the senses,

customers can easily remember themes that fit their own tastes and thoughts and reinforce them with experiences they have experienced in the past (Kara, 2015).

There is limited sensory transmission due to the fact that the senses of smell and taste are not available in virtual environment. In these environments, sensory experiences are built on hearing and vision, and consequently, they provide an experience of esthetic and pleasure (Tuncay, 2018). The purpose of enriching the virtual world with sensory elements is to create enhanced experiences by further stimulating the user's hearing and visual senses (Tuncay, 2018).

4.5.2. Emotional Experience

The concept of emotional experience is the experiences that appeal to feelings (Ekici, 2012) and aims to create experiences through the internal feelings of consumers. Strong feelings, such as positive attitude, pride and joy against a brand, form the internal feelings of consumers. Such feelings can be caused by products or businesses, people around, events. For example, if the hostess's discontent has somehow disturbed the customer during a restaurant's music or airplane trip to listen to customers, customers may be in a bad mood from this situation. This way, they may not like the food they eat at all or have never enjoyed the journey (Kara, 2015).

The emotional experience is also in line with the experience of pleasure. The experience of pleasure refers to the degree to feel content, good and happy in the situation of the consumer. The state of pleasure has a hedonic feel. The consumer will want to come back to the same medium and be a loyal consumer if they get a gravy value from the online medium where they are located, and vice versa. Pleasure refers to the degree of feeling good in the environment and is the element that influences the behavior of the approach to the environment. Approach behavior affects the desire to explore the environment correctly, the tendency to move and buy (Tuncay, 2018).

4.5.3. Cognitive/Intellectual Experience

The concept of intellectual experience refers to intellectual experiences that address cognitive functions (Ekici, 2012). The cognitive marketing phenomenon aims to use both types of thinking skills of consumers. By using the cognitive marketing activities

of the business of choice, the consumer will act on their thoughts, be surprised from time to time, and thus ensure that consumer interest remains alive (Çelik, 2013).

The cognitive experience has a link to the flow experience. The flow experience is defined by Csikzentmihalyi in his book *Flow Theory* (1975) as being fully committed to the activity that the individual is dealing with. In another definition, the consumer's mood in the flow experience has been defined as filtering out any warning outside, being enthusiastic, losing their self-thinking, receiving feedback and feeling of control (Çelik, 2013).To make a general definition by looking at these definitions, we can define the flow experience in the form of a process in which consumers are immersed in forgetting themselves and time in the online medium where they are, as well as feeling of happiness and pleasure (Tuncay, 2018). The flow experience is defined in four dimensions: Control, internal perception, curiosity, focus of attention.

4.5.4. Physical/Actual Experience

Physical experience is experiences that address physical activity, behavior (Ekici, 2012). It is implemented to provide consumers with physical experience opportunities, lead to long-term behavioral change and create experiences that result from interacting with other customers and consumer structures. By targeting the way customers behave physically, alternative ways, interactions, and lifestyle are offered to enable them to do thing. (Furtun, 2016). Interaction can be defined as the degree of impact and non-impact in the communications environment of at least two parties through messages on a common topic. The dimensions of the interaction are synchronity, active control, and bi-directional communication. Examples of the interaction experience, such as receiving responses from the live support line (Tuncay, 2018). As a general example of a physical experience, the shaver's campaign is an example of Gillette Mach 3, which has made a major and significant breakthrough in the shaving industry, with a bright and smooth design that symbolizes the 3 blade construction, speed and performance to change the physical experience of consumers in their shaving days. In this respect, physical experiences can be seen as experiences that engage consumers beyond sensory, cognitive and emotional experiences and influence their lifestyle (Furtun, 2016).

4.5.5. Social/Relational Experience

Social/relational experiences are experiences that appeal to interaction and social groups (Ekici, 2012). The concept of social experience is about social and cultural factors that include emotional, actionable, sensory and intellectual experiences. In this experience, it is intended to create a sense of belonging. In this experience, consumers relate to their ideal selves, not their personal feelings. For example, Harley Davidson motorcycles represent a lifestyle when viewed, and with this symbol, consumers see the brand as part of their personality. These brand communities have strong links between users (Kır, 2014).

With the growing spread of Internet technology, they have started to have social experiences in the Internet communities. Nambisan and Watt (2005) describe the experience that comes from interaction in online communities as an online community experience. Online community experiences consist of sub-dimensions in the form of pleasure, benefit, sociality and practicality for users. (Tuncay, 2018).

Relational experiences draw attention to sensory experiences and provide motivation. The emotional experience creates an effective connection and makes the experience personally appropriate and worth trying at the same time. Intellectual experiences permanently add perceptual interest to the product or service. Behavioral experiences create promises and loyalty. Relational experiences make experiences meaningful for individuals in the social framework, in a broad way beyond the individual experience (Tekin vd, 2015).

CHAPTER 5: CASE STUDY: VIRTUAL MARBLE FAIR

In this section, in relation with the research questions and purpose of the study first the methodology is explained, then the general information about the participants, research setting and the research process are discussed. Lastly the results of the study are discussed in accordance with the research questions.

5.1. Methodology

Qualitative analysis is adopted for the research and phenomenological analysis method is used to examine the perceptions of virtual fair participants regarding their AR experiences. Qualitative research provides the opportunity to be treated with a holistic understanding of the natural and real environments in which the content and contextual richness of the subjects of examination can be reached (Taylor et al., 2016; Yin, 2016). In qualitative research, instead of identifying cause and effect relationships, predicting and/oır explaining the distribution of the specific attributes covered in a universe and the effort to illustrate what the phenomenon means to people are the main intentions. In this sense, in qualitative research the main interest is understanding how people interpret their experiences, how they construct their own worldviews in the context of the research and how they make sense of their experience (Merriam ve Tisdell, 2016).

Phenomenology, It is a philosophical movement, which was produced in the early 20th century, with no theories about their causal explanations, unexamined, as well as a direct study and explanation of the cases that are conscious and free from prejudices and assumptions as possible (Moran, 2000; Spiegelberg, 1975). As Patton (2014) and Yıldırım and Simsek (2016) pointed out, phenomenology focuses on the fact that individuals are aware of its existence in their daily lives, but do not have a detailed understanding and insight. These facts are concepts, events, perceptions, situations in individuals' daily lives, it can manifest itself in the form of trends, emotions, loneliness, jealousy and experiences.

The study explores the AR experience that virtual fair participants have experienced. With its focus on understanding experiences, phenomenological analysis provides the ability to interpret and explain the subjective thoughts and perspectives of the participants (Bogdan and Biklen, 2007; Creswell and Poth, 2018; Van Manen, 1990).

It aims to achieve the nature and essence of conscious experience actions by seeking insights, concepts, judgments and insights from the manifestation of facts through intuitive and intellectual processes. Therefore, the explanation of the participants who do not reveal the reasons, who maintain the original texture and properties of the experience as much as possible and make it clear is one of the most important milestones of the phenomenological analysis (Moustakas, 1994).

Phenomenology as a qualitative research pattern (Creswell and Creswell, 2018; Creswell and Poth, 2018; Eberle, 2014; Merriam and Tisdell, 2016; Patton, 2014; Rossman and Rallis, 2016; Yıldırım and Şimsek, 2016), the most basic form of experience is a research approach (Patton, 2014) that queries what the nature and essence of experience means to a person or human group (Sokolowski, 2000), it has been effective in adopting phenomenological analysis as the analysis of method for this research.

The main objective of the research through the experiences of the fair participants is to reach the structure and essence of the experience by showing the perception, feelings, perspectives and how they make sense of this experience. This means that a wider and more detailed understanding of the AR and VR experience used in virtual fairs is expected. In addition, examples of different usage recommendations and how it contributes to virtual exhibitions in the digital age where opportunities for interactive experiences are increasing in the digital age, such as AR, have introduced a technology. It is intended to contribute to the AR experience and applications of both virtual fairs and advertising, providing explanations for life and their experiences.

5.1.1. Settings

The research area is a Union of Mine Exporters located in the Aegean region. The Aegean Exporters' Association is one of 13 exporter units affiliated with the Turkish Exporters Union (TIM). The Aegean Exporter Union represent over 7500 export companies operating in 12 different sectors in the Aegean region. In other words, the EIB is a roof organization representing 12 separate clusters. The main objective of the EİB is to provide resources for sustainable, profitable exports in the 12 sectors in which they operate.

One of the 12 sectors on the roof of the Aegean Exporters' Union, the Aegean Mine Exporters Union, natural stone exporters in the Aegean region. The EMİB organizes various activities to develop the potential of its member companies and increase their exports.

The Trade Delegation is one of these events. Before the Trade Delegation is organized, market research is conducted in particular, after the appropriate country is determined, the relevant country's Trade Counselor/Attachment is contacted. The advisor requests a list of companies called the "PR company" to assist in the organization of the target market specific information and delegation.

The companies on the list the advisor sends are asked for a quote and the company that offers the best quality at the most affordable price is selected. After the participation requests are met, the Ministry will apply for the event.

After the ministry's approval has been received, the selected PR company starts working in the region and organizes the process of bilateral business talks and foreign buyers to participate. In the physical delegations before the Covid outbreak, the target country is visited by relevant companies, associations, associations, facilities, factories established in this country, and most importantly, B2B bilateral business discussions are held in a hall. In the B2B bilateral business talks, our member company from Turkey tries to promote and sell its products with a translator to the receiving company.

In physical committees, these conversations occur around a square table. The Turkish dealer and interpreter sit on one side of the table. The foreign buyer is on the other side. When the buyer arrives, they meet first, the Turkish company tells about the company and its products. The foreign company also introduces itself and identifies what products they want to the other side. After the call is finished, the recipient leaves the table. They shake hands and the buyer goes to another table to meet with another Turkish company, a new buyer comes and the introductions process begins again. Every foreign company that comes is tried to be interviewed by every Turkish company. However, if there is a product they want to buy specifically (for example, mosaic), they only meet with one company and then leave the event.

Before the private meetings, a general meeting named Briefing Meeting is held. Famous architects and businessmen in the region come to this meeting and give industry-specific speeches.

The flight, accommodation, and permission process has been disrupted due to the Covid-19 outbreak at the end of 2019 as physicists process the process in this manner. And almost all fairs were canceled or performed in a virtual environment. Companies that have suffered losses due to the outbreak have not been able to find new customers since trade delegations have failed.

As a remedy for this, the delegations have started to be created in a Virtual way. T.C. The Ministry of Commerce immediately dealt with the issue and prepared a notification on the “Virtual Trade Delegation” and included these delegations in support.

EMİB organized a "Virtual Trade Delegation" organization for Vietnam on November 24-26, 2020. Prior to the organization, the target market was worked out and a deal was made with a company that was built in Vietnam.

Normally, firms bring samples with them in their physical trade delegation. Natural stones are materials that are experienced by touching. Every natural stone has its own texture. On the physical boards, firms introduce their own products with small sample stones they bring with them. In order to differentiate this and determine its price, the purchasers must carefully examine the stone. In fact, in block sales, special experts come in to identify the sensitive points inside the block, the points that can be broken in the machine.

During the B2B bilateral business talks, firms used this platform to promote their products to the other side. They zoom in on the stands, revealing the texture of the stone almost lifelike.

According to Yıldırım and Şimşek (2016), Caswell and Poth (2018), and Morse (1995, 2015) the acceptable sample size is between 3 to 15 for phenomenological analysis. In this study, 15 visitors were interviewed, taking into account the dodium (Creswell and Creswell, 2018; Morse, 1995, 2015) that was accessed in the data in terms of its scope and repetition, in order to explore the AR and VR experience they had experienced and reveal its structure and meaning.

5.1.2. Software

In qualitative studies, the researcher makes it an integral part of the research, being intertwined with the natural environment of the research field, having a direct conversation with the participants, and experiencing the phenomenon that is the subject of review. Thus, it is possible to put its own perspective in the process of analyzing the data obtained regarding the phenomenon being examined (Yıldırım and Şimşek, 2016).

The research has been started by scanning the field of VR and AR. In the literature several examples of the usage of VR and AR usage in interior architectural and in various areas of the promotional industry in various forms and purposes. However, it has been found out that research, particularly in a qualitative approach to the VR and AR experience, is limited in the literature.

Figure 5.1. Software

In this sense it has been decided by the researcher to conduct a research through a real experience that is a part of the business of the researcher herself. A specially designed software that is for the virutal B2B event has been used for the research. (Figure 5.1.) In this context the following research questions are the identifier of the phenomenological analysis. By doing so, virtual business-to-business event aimed to discover the user experience through the software and to discover the emotions and the perceptions of the users. In this sense the main questions are;

1.What kind of VR and/or AR experience do visitors experience?

2.How does VR and/or AR help visitors to their virtual exhibition experiences?

The researcher was able to conduct the study in line with the phenomenon and to ensure that the study was conducted in all stages of the research. Throughout the research process, the researcher aims to identify and reveal the perceptions, feelings, perspectives and lives of virtual business-to-business event visitors about AR and VR experiences.(Figure 5.2.) In addition, by carrying out such a study, it aims to contribute to the scientific field by providing a detailed understanding and an example of the AR and VR experience applied specifically in the virtual business-to-business event and promotional industry, and to give ideas to fair managers and AR and VR developers.

5.1.3. Digital Business-to-Business Event

One of the most important aspects of qualitative research and one of the characteristics that differentiates it from quantitative research is that data collection is not limited to a specific survey tool or a number of variables (Silverman and Marvasti, 2008). In studies conducted with a qualitative design, researchers often collect data in various ways, such as conversations, observations, documents and audiovisual information, rather than based on a single source of data (Creswell and Creswell, 2018). In addition to discussions and observations, field, author biography, retained journals can be considered as data sources for understanding the phenomenon of review (Van Manen, 1990). In this study, the researcher used semi-structured interviews and document review to obtain the data.

Discussions in this research pattern include an informal, interactive process, and open-ended comments and questions (Moustakas, 1994). In general, as Patton (2014) mentioned, the purpose of qualitative discussion, which begins with the assumption that other people's perspectives are meaningful and knowledgeable and can be expressly expressed, is to get what is going on in people's minds and their stories. In addition, Rubin and Rubin (2005) talks about the use of an interview method to obtain direct information from individuals with experience and knowledge of the research.

This study uses a semi-structured discussion method prepared with open-ended questions, as visitors refer to their views, knowledge, perceptions, opinions, judgments

and feelings about the VR and AR experiences they have experienced at the virtual fair. At this point, Patton (2014)'s approach to conversation guidance was utilized. The most important features and benefits of this conversation approach are pre-defined within a specific framework and the order of sentence structures and questions can be changed by the researcher during the discussion. This pre-created framework increases the scope of data and makes data collection more systematic for each participant. This allows the logical gaps in the data to be closed by predicting (Patton, 2014).

In order to develop questions that are relevant to the purpose and method of the study, the researcher first examined the studies in the field of VR and AR and exhibition experience, using interview questions in the conceptual framework, model and appendix of the studies that are similar and relevant to the subject and method (Falk, 2009; Falk and Dierking, 2013; hung-Che et al., 2019; Jung et al., 2020, 2017; Kaleci et al., 2017; Tepe, 2019; Wei et al., 2019) 29 draft discussion questions have been prepared. These discussion questions of the opinion that the questions were appropriate was found.

Merriam and Tisdell (2016) as noted by, the ability to ask good questions in conversations is a key way of obtaining good data, and therefore the researcher must have practice in this sense. At this point, pilot interviews have an important place to try questions. In this study, after the final version of the questions was created, the researcher conducted two pilot interviews between 22.10.2020 and 19.10.2020.

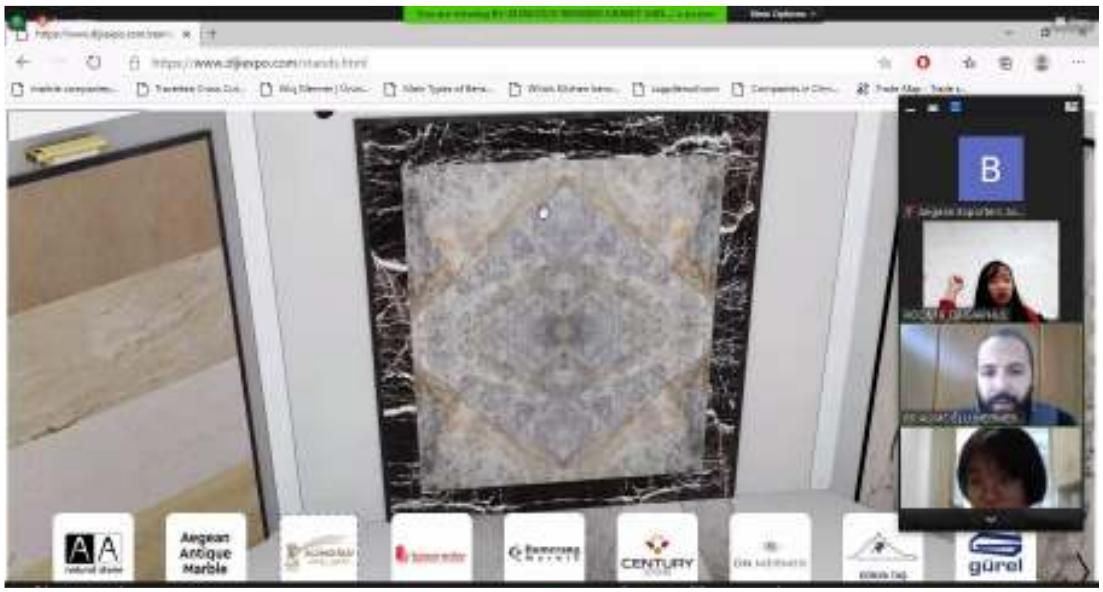

Figure 5.2. Digital Business-to-Business Event

The prepared question sheet was applied to participants on the date of the virtual business-to-business event, 24 October 2020. The interview questionnaire consists of three sections, as shown In Appendix A. The first part concsists of 4 questions about the general information of the participants, 29 questions about the VR and AR experience of virtual fair participants in the second part, and 7 open-ended questions about how VR and AR contributes to the visitors' exhibition experience in the third part. The interview questions cover the pre-visit, sequence and post-visit stages of both VR and AR and virtual fair experience, as the experience of participants in the research is taken as a process.

5.1.4. Survey

Since the association of Aegean Mine Exporters is the institution where the study researcher is working, the researcher consulted the institution manager about whether such research could be conducted at the virtual trade fair, which will be held on 24.10.2020, and obtained the necessary permission certificate. (Apendix 4)

After the permit was submitted in writing, the researcher contacted the virtual fair participants by telephone and asked them if they wanted to volunteer their research. As a result of the positive feedback from the participants, the researcher had approximately 45 minutes of interviews with company officials who participated in the virtual fair experienceon October 27, 2020 .

Patton (2014) states that there are some important factors that affect the nature of the conversation responses. These are the principles that the researcher must have and care about, such as establishing open and understandable statements, listening effectively, being empathic and unsiveled, making appropriate transitions between issues, being prepared for unexpected situations, being careful and caring. In this study, the researcher paid attention to various issues to protect the nature of the conversation and the nature of the responses from visitors.

For example, he has maintained continuous control of the recorder, both before and during the call, paused and restarted the recording at a convenient moment, such as when the participant must answer a crucial phone call, and regained his attention by acting appropriately when the participant realizes that his attention has been distracted.

she made verbal and non-verbal feedback that would not guide her by paying attention to her statements and asked questions based on the narrative flow and content of the participants and made the necessary transitions between the topics.

5.1.4.1. Interview

Although the data analysis process is expressed in different forms by various authors in qualitative research, it is mainly conducted by two types of analysis, descriptive and content analysis (Yıldırım and Şimşek, 2016). In phenomenological analysis, an intuitive integration between the dimensions of this experience and their basic textual and structural explanations are necessary to achieve a general and integrated meaning and definition of an experience (Moustakas, 1994; Polkinghorne, 1989). In other words, in phenomenological analysis, it is aimed to reach themes that can represent the experimental structure and meaning of the phenomenon, which is the subject to review because it provides order and control of research and is considered the nature of the experience (Van Manen, 1990). Yıldırım and Şimşek (2016) for this purpose, it mentions that the method of content analysis is used. As one of the methods commonly used in social sciences in general, content analysis is one of the techniques of data reduction, especially in order to produce codes and categories in interpretive phenomenological research (Denzin and Lincoln, 2018). In this study, the method of content analysis has been chosen by the researcher because it has a systematic coding and categorization approach (Grbich, 2012) that benefits from discovering the large set of text available to identify the patterns, frequency, relationships, structures and contexts of the acquired data.

The study uses Microsoft Word, Excel, and OneNote programs from computer-aided software. As Lewins and Silver (2007) mentioned, computer-aided software in qualitative research facilitates data analysis processes by providing researchers with a variety of benefits such as encoding, creating themes, recalling, organizing, and taking notes. However, it is a fact that the analysis and interpretation of the data depends on the researchers' own capabilities (Patton, 2014).

Research Process

1. *Writing:* After the end of the interviews with participants, the researcher listened to the voice recordings of the conversations and put them in writing word by word using Microsoft Word.

2. *Reading And Editing Documents*: At this stage, editorial errors in writing when reading the transcripts in the Word file were corrected, adding colors to the main questions used in the conversation form to clarify the flow of dialog in the foundries, and converted into tables by paragraphs, making it easier to encode and then transfer data to Microsoft Excel. These tables are created in four columns, including quotes, categories, codes, and descriptive notes and patterns that contain the actual content of the foundries.

3.*Temporary Code List Creation:* After the field has been scanned and read, a primitive code list has been created based on the concepts in the related studies. The researcher did not depend on this list, but used primitive codes during the analysis of the data.

4. *Encode And Categorize Data:* Here the transcripts have been reread by the researcher and coded by identifying meaningful parts. In this time, the list of primitive codes has been used, but new codes have been used for new meaning and contexts encountered. Categories were added where the codes could be linked by associating them with the research questions at the time of the coding. Thus, coding and categorization of data is carried out simultaneously.

5. *Subtracting Temporary Code And Category List:* All castings prepared in a coded manner have been transferred to Microsoft Excel. A separate temporary code and category list is created for each participant by filtering (without deleting) repeated codes and categories with meaningless parts in the foundries.

And Then, all the lists created for the participants were merged into a single file.

6.*Finalization By Revising The List Of İnterim Codes And Categories:* Once the interim codes and categories obtained from the participants' foundries have been collected in a single file, some concepts have been revised and finalized by making changes and corrections.

7. *Outline themes*: The draft themes have been achieved by examining and grouping the finalized codes and categories with a holistic look.

8. *Associating with research questions*: Associating with research questions is particularly important in the first stage coding and categorization process, as well as in revising and finalizing draft themes.

9.Finalizing The Themes: As a result of the relationship between the research questions of the draft themes, the researcher has reached the end of the themes.

10. *Reporting codes, categories and themes:* The theme, categories and codes found were passed to the research report in a simple way without explanation and illustrations based on their hierarchical relationship in a meaningful way.

11.Describe And Interpret the Findings: In the final phase of data analysis, findings transmitted to the research report were frequently explained by sampling and quoting data, interfinding links were established and interpreted by the researcher to understand findings.

5.1.4.2. Observation

Plausiveness in qualitative research is a concept of accurately representation of truth with research results (accuracy value), how applicable and transferable the results are (applicability), how consistent the research can be when repeated with the same environment and participants, and how much research results are found from the views of the participants, not the opinions and perceptions of the researchers. (Lincoln ve Guba, 1985). In this sense, there are four criteria (Guba, 1981) for the credibility of qualitative research, for the transferability, for the dependability and for the validation, (Guba and Lincoln, 1982). The researcher has the following the below strategies (Bazeley, 2013; Corbin and Strauss, 2008; Guba, 1981; Guba and Lincoln, 1982; Maxwell, 2013; Merriam and Tisdell, 2016; Miles et al., 2014; Yıldırım and Şimşek, 2016):

1.Examples were made with detailed thick descriptions in the explanation and interpretation of findings

2.The research also led to data triangulation using different data collection techniques (discussion, document review).

4.The pattern of the study is detailed in relation to the principle of transparency, the process for collecting, organizing and processing and analyzing data.

5.In terms of the use of researchers to work on the same topic, the participants involved in this study have detailed information on the area and general process in which the study is conducted.

6.The selection of participants used the purposive sampling method, which enables the transfer of research, data diversity and additional sampling.

7.In the study, prior to the discussions, the participants were contacted and the actual discussions took longer prolonged engagement and created a friendly environment and interaction, making them more comfortable.

Research ethics in social sciences is about what researchers do and shouldn't do. In other words, research ethics are the principles that should be considered by social researchers throughout the research (Hammersley and Traianou, 2012). As Creswell and Poth (2018) pointed out, it is important to share the purpose of working with participants and to indicate that there will be no risks associated with their participation. In this sense, in the research, at the beginning of the discussions with the participants, the researcher talked about the purpose of the study and the principles and principles of the conversation.

It was reported here that the research is based on volunteering, that the conversation will be recorded, that the data collected from the research will be kept confidential and used only for scientific purposes, but will be allowed to do so, that they can share the research data with them at their request and leave the conversation if they are disturbed for any reason. The research voluntary participation form, which contains this information about the conversation, is included in appendix 4.

On the other hand, Clark (2006), the ethics of the investigation refers to the importance of keeping the credentials confidential, regardless of whether the participants are mentioned in the research voluntary participation form. Therefore, although they have allowed their names to be used in research, the ethical principles of the research have

used codes for all participants, and these codes have no relation to the actual names of the participants.

5.2. Results

5.2.1. Results on the VR and AR experience of Fair visitors

The results of the VR and AR experience of exhibition visitors have reached five themes, as shown in Figure 5.3. These themes are as follows:

1.The Motivation that are effective in playing video games

2.The VR and AR experiences of visitors

3.Availability

4.Experience outputs

5. VR and AR and Promotion Relationship

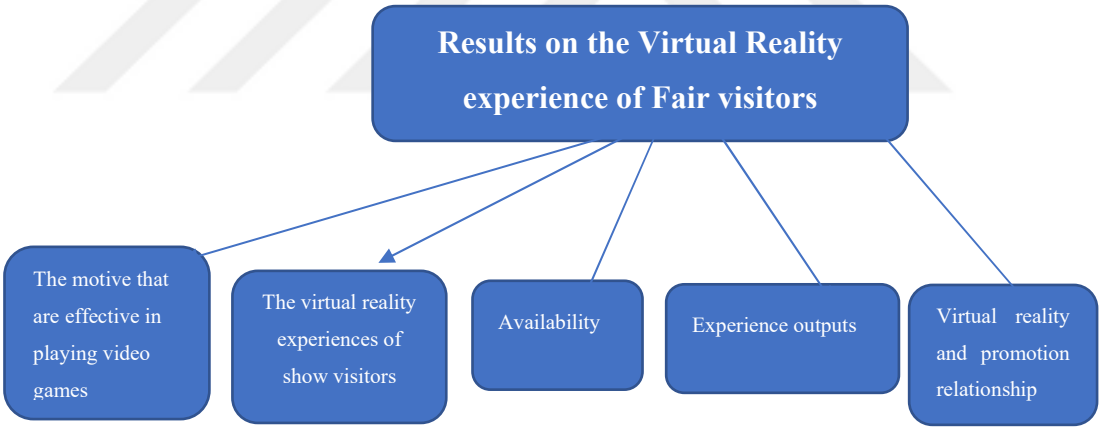

Figure 5.3. Facts About The Virtual Reality Experience Of Fair Visitors

5.2.2. Results of the themes created within the Qualitative Data

The data obtained from the participants as a result of the interviews was transferred to the written text and started to be read and passed on to the identification and classification of the data. Words or phrases in descriptive character were noted on the edges of the text during readings. The results of this review have generated codes that prepare the basis for the qualitative data analysis. The codes, which are then composed of information units associated with each other, are then collected under

subcategories. The codes and sub-categories under the themes determined by the analysis result are given in tables. In this context, 5 themes have been obtained from 81 codes.

5.2.2.1. Results of the Motive theme that are effective in computer Game Play

Table 5.1. Sub-Categories and Codes on the Motive Theme That is Effective in Computer Game Playback

Theme	**Sub-Categories**	**Codes**
The motive that are effective in playing video games	Playing Computer Game	Excitement, joy, fear, pleasure, adventure, strategy, immersive, entertainment, interaction, virtualisation, emotion, adrenaline, curiosity, difficulty, a different feeling, action, freedom
	Don’t Playing Computer Game	Negative, ridiculous, waste of time

In this section, where we try to measure the motive that is effective in playing video games, participants were first asked if they played video games and then asked which types of games they prefer. According to Table 5.1, the motive theme that is effective in playing video games consists of two subcategories, including those playing video games and those not playing, and a total of 20 codes. In this framework, the participants' overall excitement, pleasure and curiosity were found during their experiences, and the following statements were given to participants who expressed their views in this direction:

“I play video games as often as I can. I'm more interested in strategy games. Feelings like excitement, curiosity, pleasure create a different feeling” (Participant 1)

I'm playing. I prefer the type of fear. The adrenaline it releases triggers my adventurous side. (Participant 4)

While some of the participants have made positive views on playing video games, some have expressed their negative views for various reasons. The positive views include excitement, joy, fear, pleasure, adventure and strategy, Such statements have been stated and negatively stated, statements that computer games are absurd and cause a waste of time.

... computer games are a waste of time. (Participant 2)

....computer games are ridiculous at our age. (Participant 5)

5.2.2.2. Results from the Virtual Reality experiences theme of Fair visitors

Table 5.2. Sub-Categories And Codes On The Virtual Reality Experiences Theme Of Fair Visitors

Theme	**Sub-Categories**	**Codes**
Experiences	Experienced	Pleasure, pleasure, intriguing, rich experience, pozitife, pleasure, excitement,
	No Experience	The fact that the content is ridiculous ,physical discomfort

Participants who have experienced applications produced by virtual reality technology in the research were asked first what experience they had, how they felt during and after the experience, so that they could understand the essence of the experience they

experienced. According to Table 5.2, the experience theme consists of two sub-categories and a total of 9 codes, which are felt during and after the experience. In this framework, the participants' overall excitement, pleasure and curiosity were found during their experiences, and the following statements were given to participants who expressed their views in this direction:

"I was very excited because I had a chance to participate in such an important exhibition in a virtual environment" (Participant 5)

"at the same time, the sounds and music in the environment were very impressive, so it was very pleasant, I enjoyed it." (Participant 12)

"... it is not an activity that I can easily do at normal times, especially in this pandemic process. I enjoyed doing this virtually because I couldn't do the real thing." (Participant 15)

"... We have both learned and wondered how the marble products were transferred to such a good virtual environment." (Participant 3)

Although participants often have positive opinions about what they feel after the experience, some are not satisfied with the experience they experienced for various reasons, they expressed their views. Positive opinions include the wealth of experience, pleasure and pleasure of experience, and negatively, expressions that the application content makes the user feel ridiculous and causes various physical discomfort. So that during the field work, some participants were observed by the researcher, who did not feel physically comfortable having an interview immediately after the experience. After they felt comfortable, the negotiations continued. Below are some of the positive and negative views expressed by the participants at the end of the experience with quotes.

"I was nervous because I didn't know how....." (Participant 7)

"I couldn't understand how a very important application would take very short, it seemed absurd to me" (Participant 2)

"I'm excited. I don't know if it's normal, because I tried it for the first time, but I can't say that I'm very good right now...." (Participant 14)

"... it was an app I was very curious about. This experience of the product has been a different event." (Participant 6)

“rich in product diversity. I think these types of applications already enrich your experience.” (Participant 12)

“when the experience was over, I said, wow, I joined the virtual fair. (laughter)." (Participant 15)

During and at the end of the experience, there are participants who do not change their views on the application positively or negatively, but also those who have negative perceptions before and during the experience, but have a positive perception at the end of the experience. Participants who expressed their views in this direction stated that they had first experienced applications produced with virtual reality technology.

“I thought it was very strange at first, because it was the first time I used it. So there was a little anxiety and curiosity. I said I can't possibly... Then the app started… at first I was really confused. Then it was very impressive to see products from every angle.” (Participant 10)

“I was afraid at first . It didn't really take long, but the first few minutes seemed like hours, and then I got used to it, so I guess… when the experience was over, I never thought about it, but I'm really sorry.” (Participant 7)

“even though there was an adaptation problem at first, I agree with the product promotion in a virtual environment for the first time……. I wonder how I should look where. But I got used to it immediately and we kept going." (Participant 13)

5.2.2.3. Results of Availability Theme

Table 5.3. Sub-Categories and Codes for Availability Theme

Theme	Sub-Categories	Codes
Availability	Convenience in Fair Sector	360 degrees, cheap, useful, technological, the system, environment, ergonomic, content, technical, providing preliminary information, design, image quality, control, interactive it's a temporal benefit. a safe environment, technical information, holistic, easy to learn
	Negative impact on the fair sector	Expensive, hardware weight, short driving, physically challenging, technical inadequacy, focus problem, movement constraint, infamiliarity, content constraint, new it's happening, complex use, discomfort giving, not being isolated from the environment, checking the problem with it is sensory incompetence

In the research, participants were asked about the technical, physical and psychological positives and negatives of the application produced by virtual reality technology they experienced, so that the user-led availability of the application experienced was studied. Table 5.3. shows that the availability theme consists of two sub-categories, positive and negative aspects of the application produced with virtual reality technology, and a total of 34 codes. Participants often express their views on the positive aspects of the applications they experience, such as providing virtual preview of a real-life event or space, allowing them to view the environment at 360 degrees, some applications being educational and instructive, providing a safe environment and providing the user with a temporal benefit, and the relevant participant statements are given below.

“in real life, so you can do something in a virtual environment that you can’t do in this pandemic process, but with confidence… this is probably the most positive part.” (Participant 18)

“the positive aspects of the experience were too high. I've experienced a fair I've never seen, so it's a way that normally takes me hours. Instead of doing this, I visited a whole fair in a few minutes." (Participant 4)

“the positive side was to have the opportunity to experience a reflection of the fair experience that I wanted to experience in reform without getting tired and spending too much budget, and the negative part was not being able to touch the product.” (Participant 6)

“it provides a quick tour for those like us who don’t have time. For example, I now participate in virtual fairs rather than spending time at physical fairs. This experience has provided it today.” (Participant 13)

General attendee statements on the negative aspects of applications produced by virtual reality technology focus on hardware-related disturbances, high cost of applications, physically challenging aspect, individual focus problems, and short duration of implementation. The following are the negative participant opinions within this scope.

“… the downside… it took a short time. It can be longer, maybe longer, but I don't know if it has any other effect, physically or psychologically." (Participant 11)

“… i think it was negative that we were unable to get information about the texture of the product from the application. This may be due to a lack of hardware.” (Participant 10)

“We have a focus problem at first because we are experiencing a very moving activity virtually, so it's not something we're used to”. (Participant 15)

“… the downside was that there was no feeling of touch.” (Participant 6)

Some participants say that they experienced some problems with virtual reality technology hardware or application at the beginning of the experience, but they were able to overcome and practice these problems in the rest of the experience.

“The downside was that there seemed to be a problem with the resolution quality of the content, and I even told the clerk. I don't know if he had any settings, he made it very clear, and then it was okay." (Participant 9)

“… in the first few minutes of the application, i had a problem adapting for a short time. In real life, it would probably be like this… then it passed quickly.” (Participant 3)

“there was a lack of equipment.” (Participant 2)

5.2.2.4. Results of Experience Outcomes Theme

Table 5.4. Sub-Categories and Codes for experience Outcomes Theme

Tema	**Sub-Categories**	**Codes**
Experience Outcomes	To be satisfied with the experience	Realistic, three dimensions, watching, feeling reality, adding meaning to reality, being there, pretending to be real, embodiating, technological, moderate
	Dissatisfied with the experience	Visualization, feeling, depth, content, marble, environment, correct information, movements, environment, the feeling that's alive, don't touch it

In the research, participants who have experienced applications produced by virtual reality technology were first asked if they were satisfied with the experience, so that they were able to understand the essence of the experience they had experienced. According to Table 5.4, the theme of experience outputs consists of two sub-categories and a total of 22 codes, to be satisfied with the experience and not satisfied with the experience. In this context, in general, during participants' experiences, realistic, three dimensions, watching, feeling of reality, adding meaning to reality, the concepts of being there, as if they were real, embodization and technology have been found, and

the following are the statements from participants who have expressed their views in this direction:

"it felt like I could touch it with the sense of reality and being there that the marble had awakened". (Participant 8)

"it felt like I could touch it with the sense of reality and being there that the marble had awakened". (Participant 3)

"the quality of both visual content, the appearance of objects in the simulation, as well as the flow of the event was very real……" (Participant 7)

"it was very realistic to be completely in that area… there was a feeling that if I reached out my hand, I would be able to touch the products and it was quite successful." (Participant 14)

Although one learner has expressed a positive opinion about the satisfaction of the application he has experienced, it states that the applications in Turkey are not yet at sufficient level in terms of hardware and content.

"I just think that those software there can move forward. I mean, I have a sense of reality that's beautiful when we look at it right now, but… since I also know very good practices abroad, I think it might be better for us, too." (Participant 10)

Unlike other participants, 11 participants have not provided any positive feedback on the practice they have experienced. He used the following statements and mentioned that he was not satisfied with the application.

"it was unrealistic, of course. After all, yes, we attended an important fair in virtue, and the images used were real images of one-on-one marble, but it was just a few images… it certainly didn't seem real to me to be attending the fair in this way." (Participant 11)

5.2.2.5. Results of Virtual Reality and Promotion Relationship Theme

Table 5.5. Sub-Categories and Codes for Virtual Reality and Promotion Relationship Theme

Theme	**Sub-Categories**	**Codes**
Virtual Reality and Promotion Relationship	Use in the promotion industry	Soon to go to the fair, travel, independence from space, promotional work, time saving, covid-19, pandemic,
	Traditional methods of promotion potential to replace	Complementary, supportive. the future his uncertainty is impossible. communication, rooted changes, probability, travel barrier for what happened, technology has improved commitment

According to Table 5.5, virtual reality and promotional theme consist of two sub-categories and a total of 16 codes, including the use of virtual reality technology-generated applications in the introduction industry and the potential to replace a real promotional experience. In the research, participants were asked what areas of the demonstration sector they have experienced can be used in and can not replace a real experience of promotion, so the relationship between virtual reality technology and the promotion sector has been determined by the perception and perspective of users. The discussions first asked participants what areas of the demonstration industry are available for applications produced with virtual reality technology.

In this context, the participants were first informed if they had any information about the experience they had performed, in other words, a regenerative activity, and if they did not have any knowledge, they were informed. In addition, participants who do not have sufficient knowledge of which areas the promotion sector covers and who request

information have been provided with a preliminary knowledge by the researcher on which key actors of the promotion sector are not affected by their views. Participants describe what areas of the demonstration industry are available for applications produced with virtual reality technology in the following statements.

"as a fair, you can go around a place, i.e. it can be used in the promotion of different mines. These applications can be made for certain places on domestic and overseas exhibition routes, where people can visit them, virtually with their real images… new products can be designed to provide visits." (Participant 15)

"… it can be useful in different products or exhibition tours." (Participant 5)

"it can be used in any area where people will both have fun and learn something. One of them is… perhaps with these technologies it is possible to visit fairs in another country every day. Companies have already started using them on their website, and before you go, you can even look at how they have products, how they make production. But of course, they're not as realistic as they are, more like three-dimensional photographs… I've seen these applications in many of the job interviews I've been in. I think it's very effective, especially because it offers a teaching environment." (Participant 7)

"it is possible to create content that people will communicate with each other with mass organizations. Exhibition tours can be performed with virtual assistants..." (Participant 12).

"I think it can be used in most areas of the promotion industry. As with the practice I've experienced, maybe cities can be used to promote countries. It is possible that people can go to most of the places abroad in their dreams with this technology." (Participant 4)

5.2.3. Results of the Descriptive Data

5.2.3.1. Results of the Participants' Demographic Characteristics

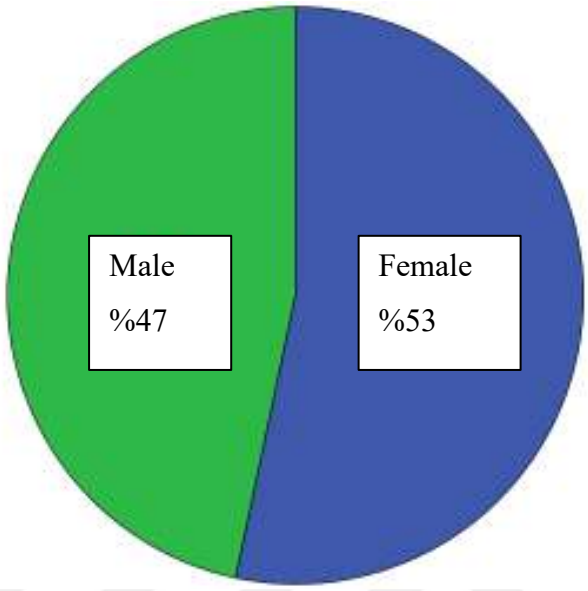

Figure 5.4. Gender of Participants

According to the gender information in Figure 5.4, 7 of the participants (47%) are male and 8 (53%) are female.

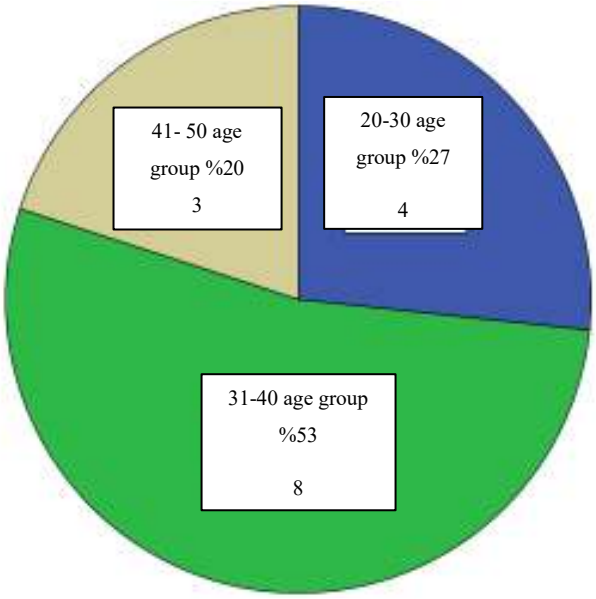

Figure 5.5. The Age Group of Participants

According to the age information found in Figure 5.5, 4 of the participants (27%) are between 20-30 years old, 8 (53%) are between 31-40 years old and 3 (20%) are between 41-50 years old.

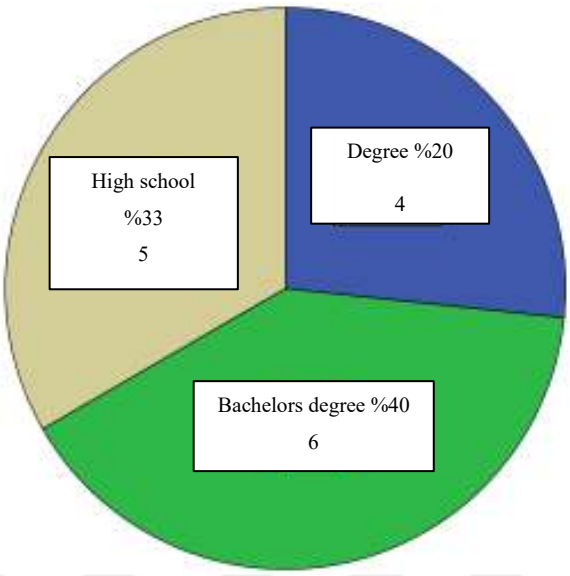

Figure 5.6. Learners' Level Of Training

According to the training information in Figure 5.6, 5 (33%) of the participants are high school, 6 (40%) are Bachelors degree and 4 (27%) are Degree.

5.2.3.2. Results of the Regarding the Experience Questions Asked to the Participants

Knowledge Level

The diversity, level of detail and type of information are generally determined in system design and development, in the time, accuracy and reliability of system operations. Srinivasan (1985) selected “reporting content and form” to see how effectively the user measured the accuracy of the system, content, reliability, competency, and the intelligibility of reports. These forms also include the quality of the format, the time of the reports, the shape of the presentations, and the sort of information. Information on the Internet is not only dependent on reports, but also on users interpreting them. The most commonly used measurements are content and content quality (Ranganathan et al., 2002). The questions and answers that demonstrate the level of learners' knowledge are as follows.

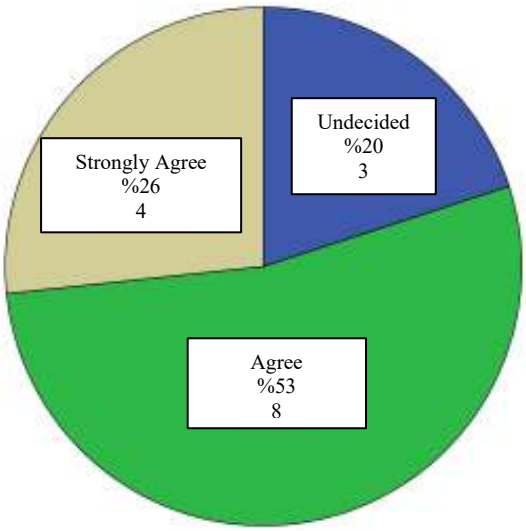

Figure 5.7. I am familiar with the use of virtual reality technologies (VR).

According to the information contained in Figure 5.7, 3 (20%) of the participants have been undecided, 8 (53%) agree, 4 (27%) strongly agree with the expression “I know how to use virtual reality technologies (VR).

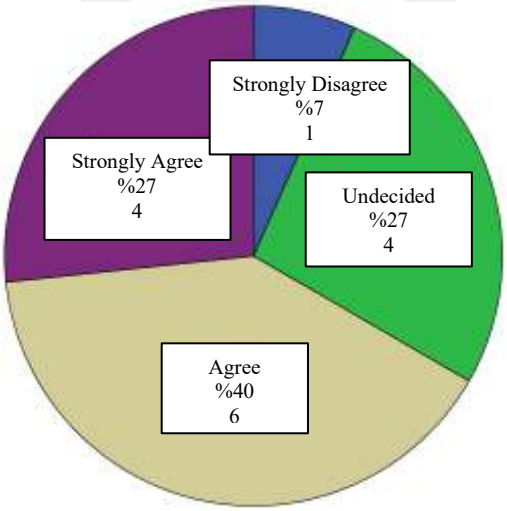

Figure 5.8. I am familiar with the use of augmented reality technologies (AR).

According to the information contained in Figure 5.8, 1 (7%) of the participants strongly disagree, 4 (27%) ambiguous, 6 (40%) agree, 4 (27%) strongly agree.

Perceived Satisfaction

Satisfaction is a feeling of satisfaction or disappointment resulting from the performance of the product or service compared to the expected level (Chen, 2012). It is more likely that a customer who is not satisfied with the product or service offered is more likely to investigate alternatives and evaluate competitor offerings (Anderson and Srinivasan, 2003).

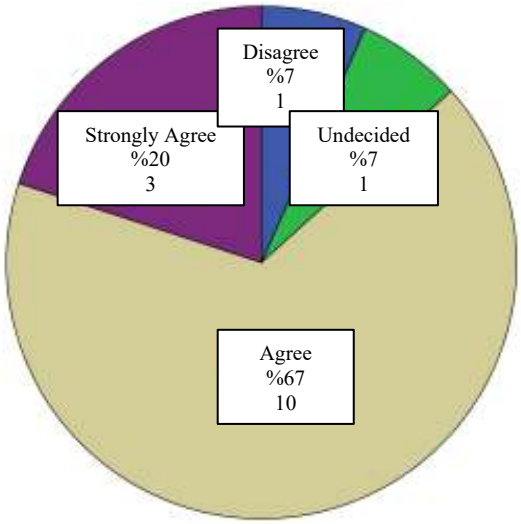

Figure 5.9. I am pleased that the use of virtual reality technologies has increased.

According to the information contained in Figure 5.9, 1 (7%) of the participants do not agree with the "I am satisfied with the increased use of virtual reality technologies", 1 (7%) of them are undecided, 10 (67%) agree, 3 (20%) strongly agree.

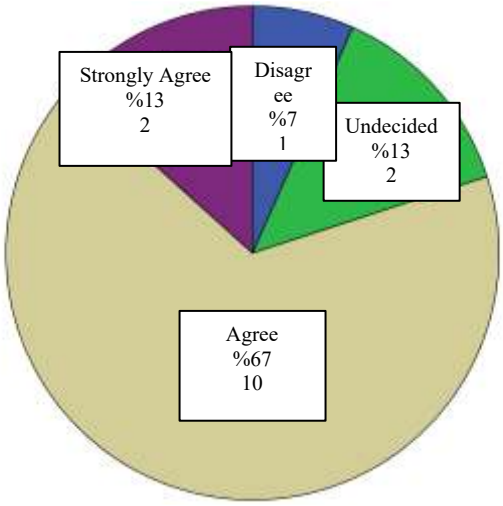

Figure 5.10. Presentations prepared with virtual reality technologies are more effective than presentations prepared in traditional ways

According to the information in Figure 5.10, "presentations prepared with virtual reality technologies are more effective than traditional presentations", 1 of the participants (7%) disagree, 2 (13%) ambiguity, 10 (67%) agree, 2 (13%) strongly agree.

Perceived Reality

The real world refers to the physical world that includes the user at the moment of experience and refers to the world that is perceived as part of the targeted VR experience in the virtual world (Steven, 2016). The person who controls which aspects of the virtual world the computer is viewing is the computer user as the last part of any VR system. In this respect, the user becomes part of the computer to some extent, has the illusion of controlling the environment directly and enables the computer to respond to its movements. Since VR offers a much more intimate way to interact with computers than typing keyboard commands or clicking mouse buttons, all of the hardware components of VR are trying to adapt computers to users (Grady, 2003). At the same time, virtual worlds use digital nature to monitor the activities within people, by using physiological interfaces, the emotions they touch, look, do and even potentially experience (Levine, 2016).

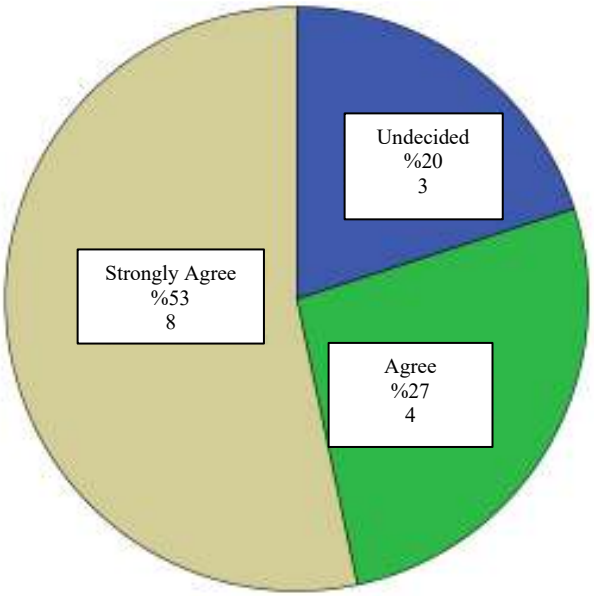

Figure 5.11. Project 3-dimensional space visualizations are critical to space perception

According to the information in Figure 5.11, "3-dimensional space visualization is of great importance to project space perception", 3 of the participants (20%) are indecisive, 4 (27%) agree, 8 (53%) strongly agree.

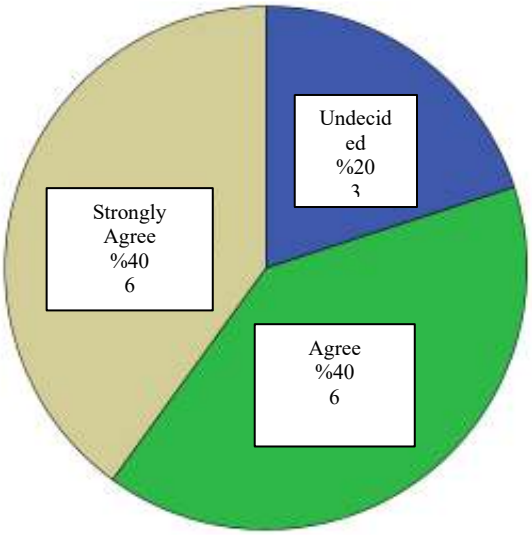

Figure 5.12. Three-dimensional technologies, such as virtual reality, help us to more accurately and realistically detect the perception of interiors and sizes.

According to the information in Figure 5.12, "three-dimensional technologies such as virtual reality help us to more accurately and realistically perceive the perception of

interior and size", 3 of the participants (20%) are indecisive, 6 (40%) agree, 6 (40%) strongly disagree.

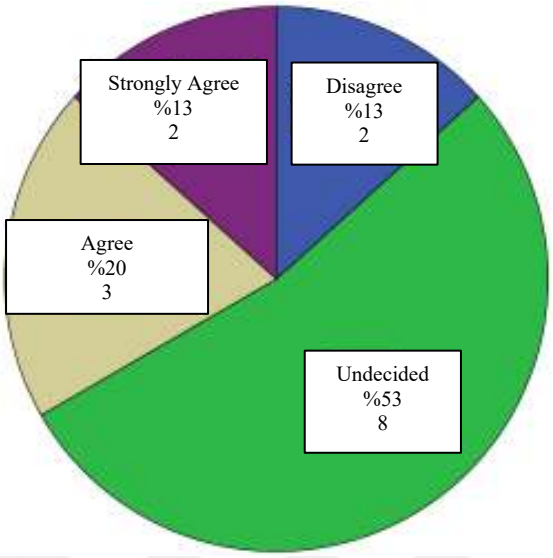

Figure 5.13. Experiencing material in a three-dimensional and realistic environment with texture and color relations provides all the information you want about the material.

According to the information in Figure 5.13, 2 (13%) of the participants disagree, 8 (53%) ambiguity, 3 (20%) agree, 2 (13%) strongly fold.

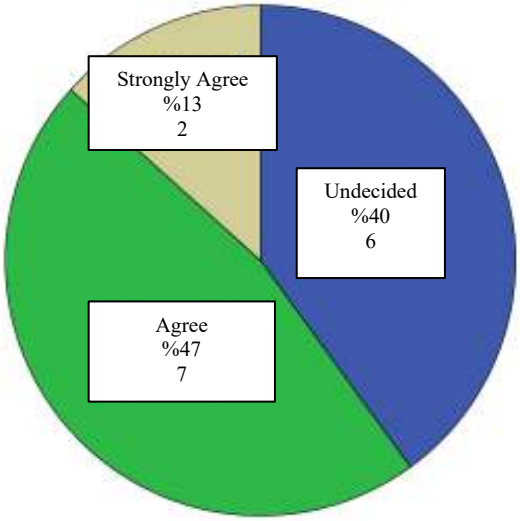

Figure 5.14. Experiencing material usage in a three-dimensional and realistic environment minimizes the margin of error in design decisions and material selection.

According to the information contained in Figure 5.14, 6 (40%) of the participants agreed, 7 (47%) agreed, 2 (13%) strongly agreed to the expression “experiencing material usage in a three-dimensional and realistic environment minimizes the margin of error in design decisions and material selection.”

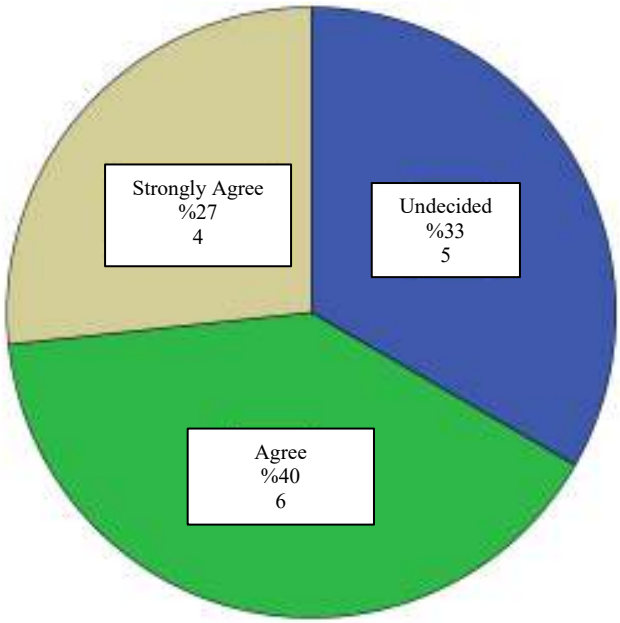

Figure 5.15. I would prefer to be able to see material in three dimensions, not in a virtual interior, but on a real interior.

According to the information in Figure 5.15, 5 (33%) of the participants agreed, 6 (40%) agreed, 4 (27%) strongly agreed, “I would prefer to see material usage in three dimensions on a real interior, not in a virtual interior.”

Perceived İnteraction

Virtual reality environments provide goals for relationship development (Barker, 2016). Participants use the platform as a mechanism for social experience. These participants enjoy the joy, joy and delusion that are the result of the social experience of social connections and personal recognition that comes from being on the same platform as others (Lazzaro, 2004).

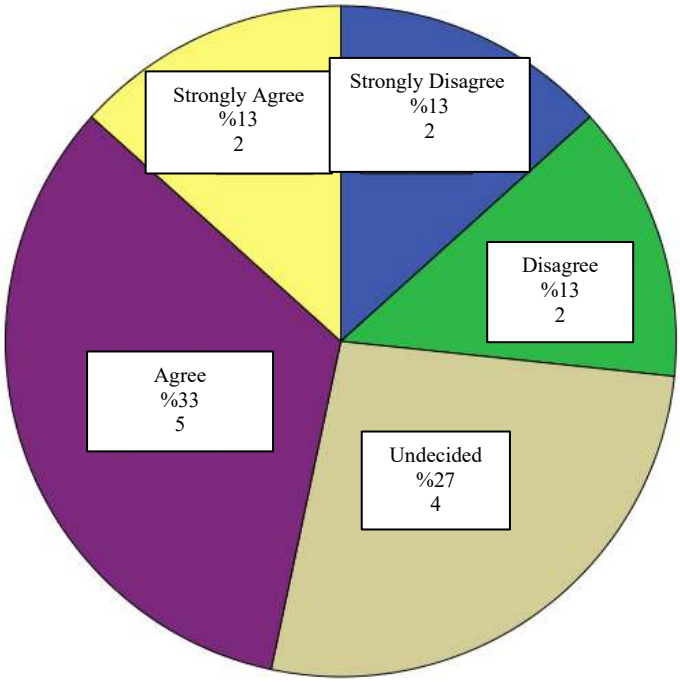

Figure 5.16. I am satisfied with the virtual reality application used in dual business conversations

According to the information in Figure 5.16, 2 of the participants (13%) strongly disagree, 2 (13%) disagree, 4 (27%) ambiguous, 5 (33%) agree, 2 (13%) strongly agree.

Perceived Control

All interactions between participants depend on interaction, such as controlling the movement of the product and changing objects in the virtual world. The design of virtual reality environments has a great impact on the satisfaction of participants. While the interactivity distance between people and working objects is closer, it also enhances the feeling of participants entering the platform, increasing their internal motivation and dive level. The accuracy, strategy and performance of the interaction, as well as its presence, participation and availability, significantly impact subjective judgments (Gao et al., 2018).

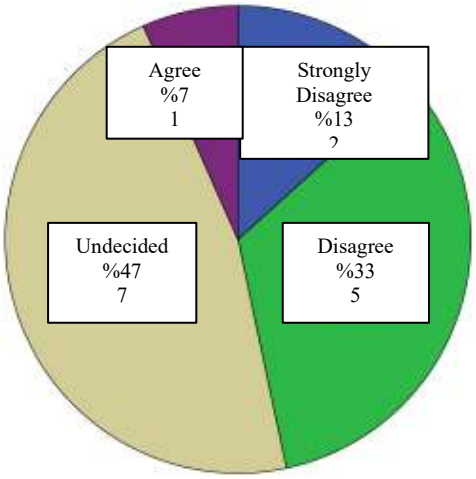

Figure 5.17. I was in complete control of the virtual show navigation

According to the information contained in Figure 5.17, 2 (13%) of the participants strongly disagree, 5 (33%) disagree, 7 (47%) ambiguous, 1 (7%) agreed.

Involved

Complex technologies that replace sensory information in the real world with synthetic stimuli such as 3D visual images, spatial sounds, and tactile feedback. The purpose of immersive virtual environments is to allow the user to experience a computer-generated world as if it were real (Bowman and McMahan, 2007). VR systems can block all signals in the real world, allowing the user to enter a completely synthetic environment. (Anderson vd, 2010).

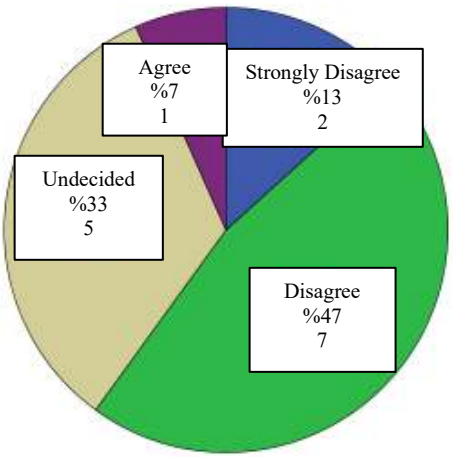

Figure 5.18. The virtual exhibition environment has responded to my expectation of the exhibition experience

According to the information in Figure 5.18, 2 (13%) of the participants (47%) disagree, 5 (33%) undecided, 1 (7%) agreed.

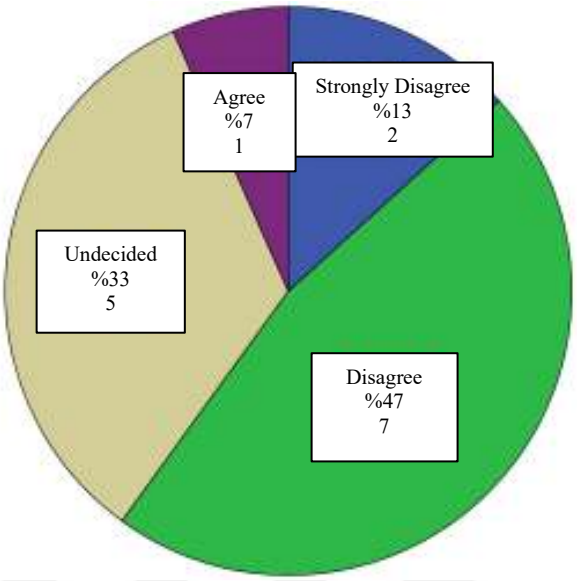

Figure 5.19. I had a realistic visual experience

According to the information contained in Figure 5.19, 2 (13%) of the respondents strongly disagree with the expression “I had a realistic visual experience”, 7 (47%) disagree, 7 (47%) undecided, 1 (7%) agreed.

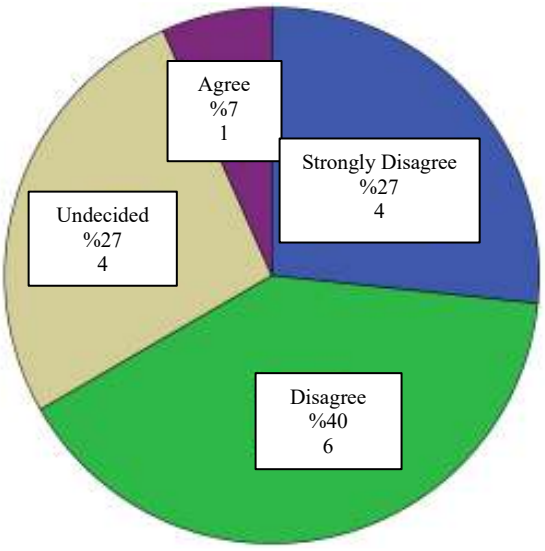

Figure 5.20. It appealed to all my senses

According to the information contained in Figure 18, 4 (27%) of the participants strongly disagree, 6 (40%) disagree, 4 (27%) ambiguous, 1 (7%) agreed.

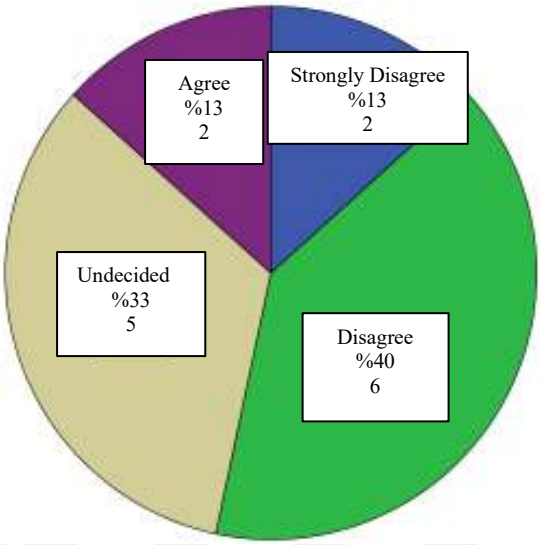

Figure 5.21. The visual feature of the virtual fair has taken me in.

According to the information in Figure 5.21, 2 (13%) of the participants strongly disagree, 6 (40%) disagree, 5 (33%) ambiguous, 2 (13%) agreed.

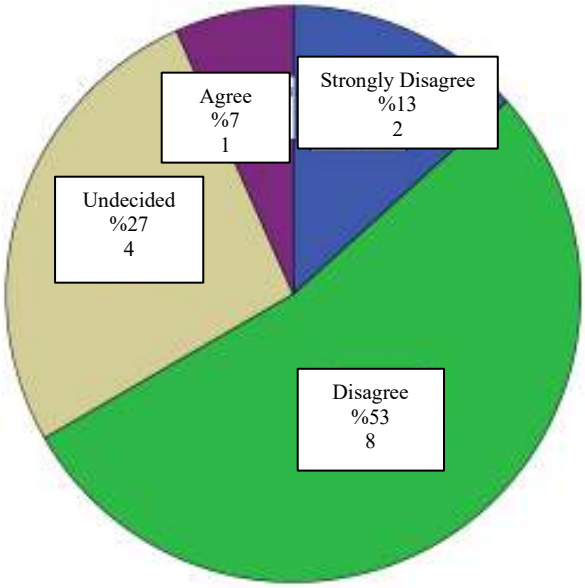

Figure 5.22. The experience within the virtual fair has delivered an experience close to nature.

According to the information in Figure 5.22, 2 of the participants (13%) strongly disagree, 8 (53%) disagree, 4 (27%) ambiguous, 1 (7%) agreed.

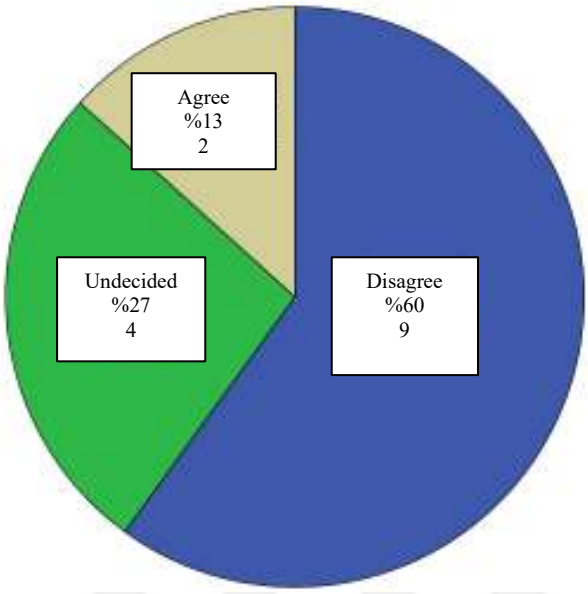

Figure 5.23. The experience within the virtual fair is incompatible with the actual experience.

According to the information in Figure 5.23, 9 (60%) of the participants did not agree with the actual experience in the virtual fair, 4 (27%) of them did not agree, 2 (13%) agreed.

Perceived Ease Of Use

It is the degree to reach the belief that the user can use this innovation effortlessly when they are in the idea of using innovation. Before deciding on adopting a new technology, understanding the complexity associated with it would be an important step in this direction (Verma et al., 2018). To make the perceived ease of use simpler, if the user can do the work they do using technology without too much effort and effort, the user will think that technology is easy to use. Because of this idea, he will tend to use that technology constantly (Solak, 2012). Davis et al the structure of ease of use detected according to (1989) is based on the complexity of the adoption of innovations, the theory of self-sufficiency and the paradigm of cost-benefit. The perceived ease of use has a greater effect than the perception of benefit on attitude. Because they have reported that the user has positive feelings for him because he thinks it's easy to use a system (Davis, Bogozzi and Warshaw, 1989; Huang, 2003)

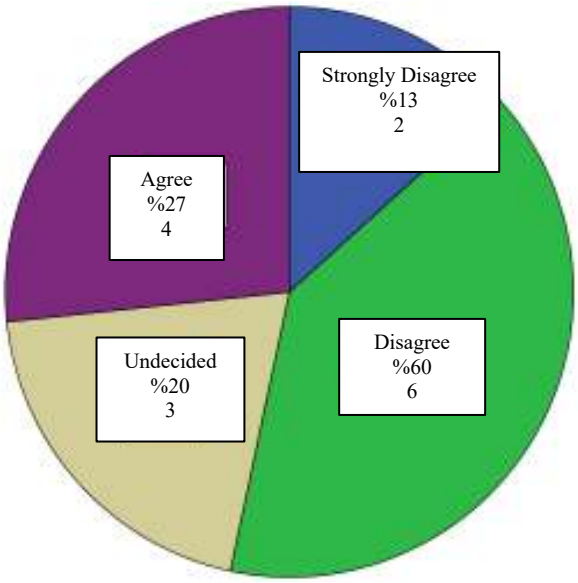

Figure 5.24. I was able to use the virtual exhibition environment very actively.

According to the information in Figure 5.24, 2 (13%) of the participants are strongly disagree, 6 (40%) disagree, 3 (20%) ambiguous, 4 (27%) agreed.

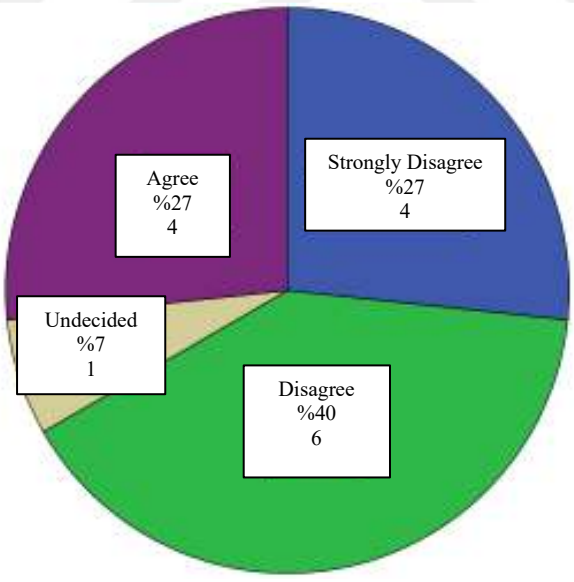

Figure 5.25. Moving through the virtual fair was challenging.

According to the information contained in Figure 5.25, 4 (27%) of the respondents strongly disagree, 6 (40%) disagree, 1 (7%) ambiguous, 4 (27%) agreed.

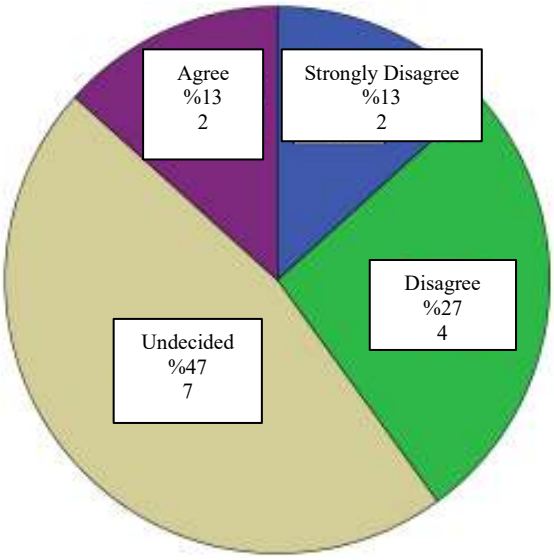

Figure 5.26. I was able to look very closely at the objects (marble) displayed.

According to the information in Figure 5.26, 2 of the participants (13%) strongly disagree, 4% (27%) disagree, 7% (47%) ambiguous, 2% (7%) agreed.

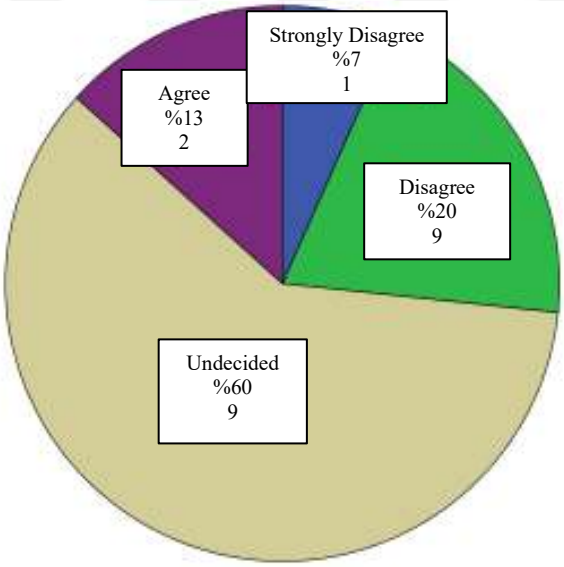

Figure 5.27. I was able to look at the displayed objects (marble) from different angles

According to the information in Figure 5.27, 1 of the participants (7%) strongly disagree, 3 (20%) disagree, 9 (60%) ambiguous, 13 (2%) agreed.

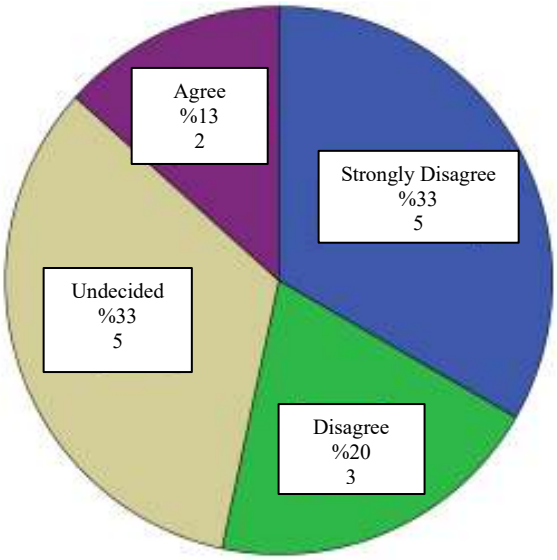

Figure 5.28. I have difficulty adapting to the virtual exhibition environment.

According to the information contained in Figure 5.28, 5 (33%) of the respondents strongly disagree, 3 (20%) disagree, 5 (33%) ambiguous, 2 (13%) agreed.

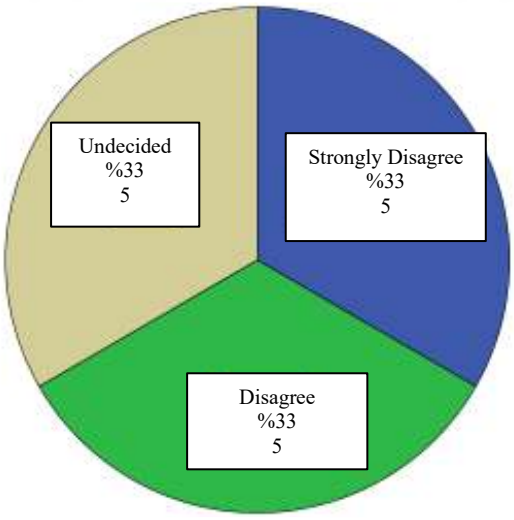

Figure 5.29. The virtual fair is a distraction.

According 5 to the information contained in Figure 5.29, 5 (33%) of the respondents (33%) strongly disagree, 5 (33%) have answered the undecided.

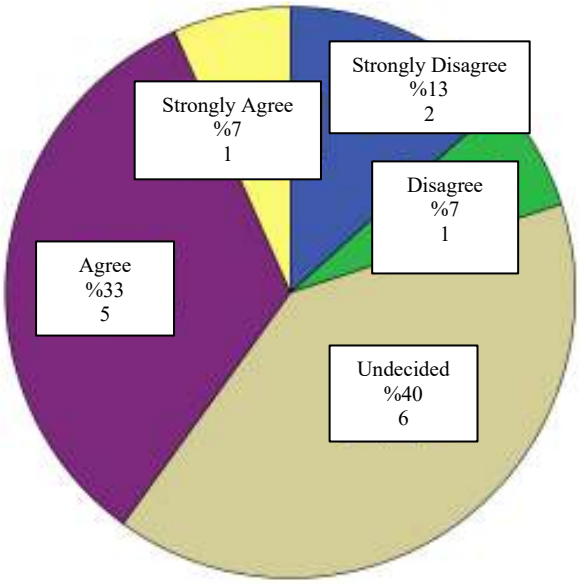

Figure 5.30. The software responds quickly to my movements in the virtual exhibition environment without any delays.

According to the information in Figure 28, 2 (13%) of the participants strongly disagree, 1 (7%) disagree, 6 (40%) ambiguous, 5 (33%) agree, 1 (7%) strongly agree.

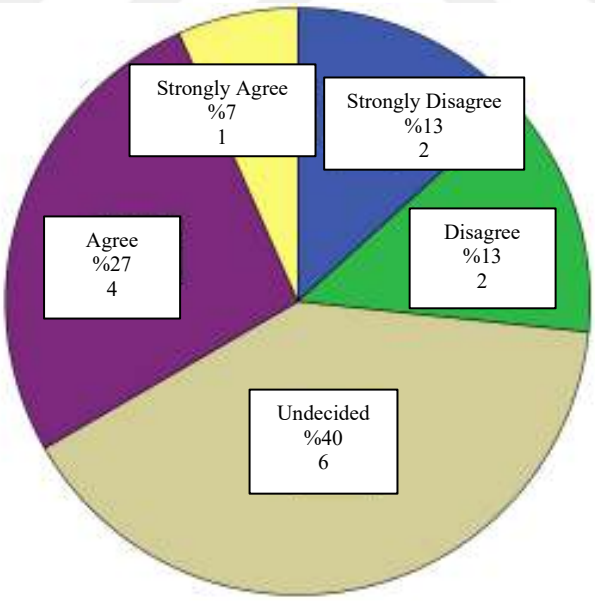

Figure 5.31. I immediately adapted to the virtual exhibition experience.

According to the information in Figure 5.31, “My actions in the virtual exhibition environment will react quickly without any delay”, 2 (13%) of the participants strongly disagree, 2 (13%) disagree, 6 (40%) ambiguous, 4 (27%) agree, 1 (7%) strongly agree.

Perceived Trust

Technology adoption and trust relationship is particularly related to its infrastructure based on information technologies. Because the complexity of using information technologies and uncertainty in the virtual environment increased the need for trust in computer-based transactions (McNight and Chervany, 2002). Trust helps consumers to be more willing to do online transactions by reducing or eliminating systemic risks from the nature of the Internet (Midha, 2012:199; Marett et et al., 2015:62). In other words, trust builds positive attitudes toward the system, creating the basis for the user to perceive the system as both useful and useful.

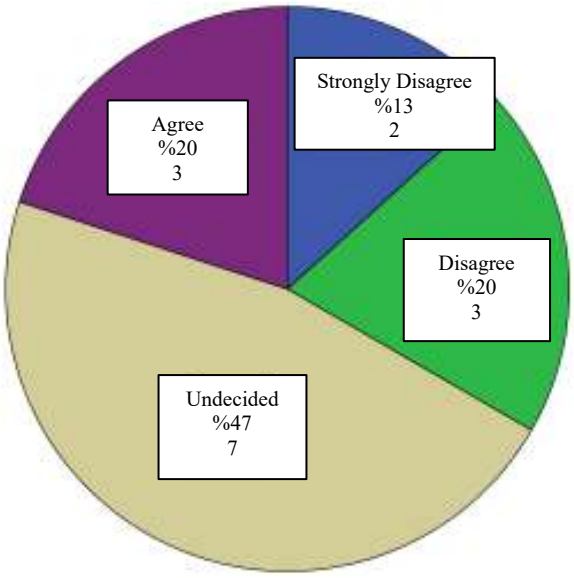

Figure 5.32. At the end of my experience, I was able to move more comfortably and safely in the virtual exhibition environment.

According to the information in Figure 5.32, 2 of the participants (13%) strongly disagree, 3 (20%) disagree, 7 (47%) ambiguous, 3 (20%) agreed.

Intended Use

The Technology Admit Model explains that actual behavior is based on behavioral intent and that behavioral intent is determined according to its intended use. In this respect, behavioral intent has a direct effect on the actual use of a particular

technology. This structure is derived from the Theory of planned behavior (Davis 1989).

In this respect, theoretically behavioral intent represents an individual's deliberate formulated plan to perform or participate in a particular behavior (Ajzen, 1991; Sager and Menon, 1994; Manis and Choi, 2019). The specific behavior is shaped according to a specific research topic, such as the intention to use it, the intention to visit again, the intention to spread from positive mouth to mouth.

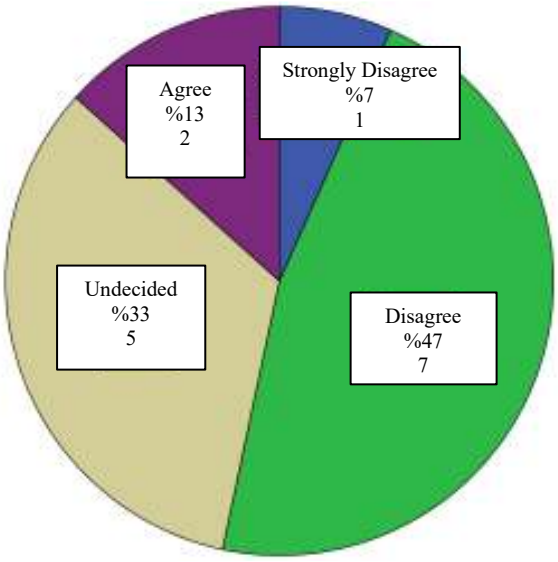

Figure 5.33. The virtual exhibition experience as an interface made from the smartphone/tablet screen is realistic and the virtual exhibition experience is restrictive to realism.

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According to the information in Figure 5.33, 1 (7%) of the participants strongly disagree, 7 (47%) disagree, 5 (33%) indecisive, 2 (13%) agree.

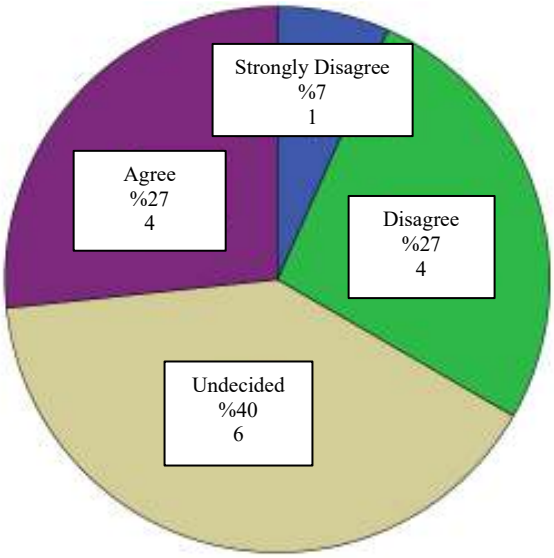

Figure 5.34. The AR experience is more realistic than the VR experience, the AR experience is more realistic than the VR experience.

According to the information in Figure 5.34, "the AR experience gives a more realistic feeling than the VR experience," 1 (7%) of the participants strongly disagree, 4 (27%) disagree, 6 (40%) ambiguous, 4 (27%) agreed.

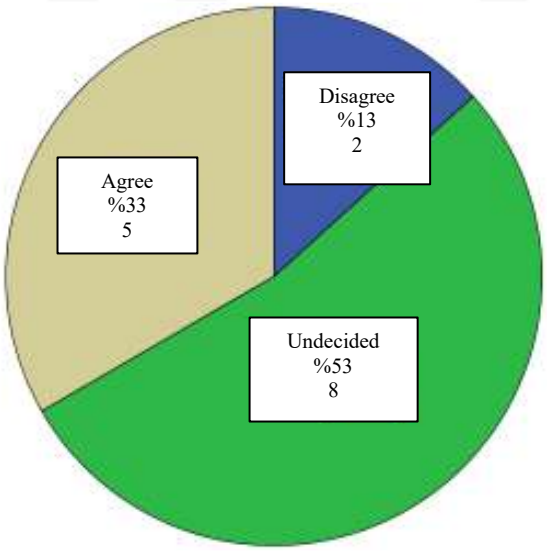

Figure 5.35. I prefer the virtual environment in which I can be within the virtual environment.

According to the information in Figure 5.35, 2 (13%) of the participants disagree with the statement “I prefer the virtual environment that I can be in (immersive) virtual environment”, 8 (53%) undecided, 5 (33%) agreed.

CHAPTER 6: CONCLUSION

Every new technology introduced to the everyday life would start from scratch and develops itself with the feedback of its users. New ways of improvements, usages and the accidental discoveries creates a development process which can span from years to decades. AR is one of these that is a an emergent technology still in development even after decades.

This study, where we look at the use of AR technology in interior architectural/design applications, is based on T.C. The Ministry of Commerce cooperation was built with the Aegean Exporter Units (EİB). The Aegean Exporter Corps has organized a virtual delegation instead of a physical delegation to Vietnam due to the Covid-19 epidemic process we are in. Digital exhibition service has been purchased by the Aegean Exporter Units to enable participating Turkish companies to promote their products more easily.

The study is aimed at Turkish participants who participated in this virtual delegation and experienced and introduced their products using this application.

This study aims to examine the perceptions of VR and AR experiences of virtual fair participants, and the method of qualitative research was conducted with a phenomenological analysis. For the purpose of the study, a response is sought to questions about the motivations that were effective for virtual fair participants to decide to try VR application, the dimensions of the VR and AR experience, the recommendations for how VR and AR can be used differently within the promotion industry, and what their contribution to VR and AR 's fair experiences is.

Research data is collected with semi-structured interviews and document review techniques. The participants were selected by referring to the maximum variation and criteria sampling techniques intended for and thus, only visitors who experienced VR and AR were interviewed at the virtual fair. The data obtained from these discussions were analyzed with accordance with the phenomenological analysis. Five different themes have been achieved by analyzing data as of content. These results are summarized below as part of the research questions.

These themes are as follows:

1.The moths that are effective in playing video games

2.The VR experiences of show visitors

3.Availability

4.Experience outputs

5. VR and Promotion Relationship

Results of the first theme; It consists of two sub-categories, including video games players and non-players, and a total of 20 codes. In this framework, the participants were found to be excited, excited and curious during their experiences, and an example of this view is given below.

"I play video games as often as I can. I'm more interested in strategy games. The excitement, curiosity, pleasure that it arouses in me creates a different feeling." (Participant 1)

While some of the participants have made positive views on playing video games, some have expressed their negative views for various reasons. The positive views include excitement, joy, fear, pleasure, adventure and strategy, Such statements have been stated and negatively stated, statements that computer games are absurd and cause a waste of time.

"... computer games are a waste of time". (Participant 2)

Results of the second theme; Participants who have experienced applications produced by VR and AR technology in the research were asked first what experience they had, how they felt during and after the experience, so that they could understand the essence of the experience they experienced.

The experience theme; consists of two sub-categories and a total of 9 codes, which are felt during and after the experience. In this framework, the participants were found to be excited, excited and curious during their experiences, and an example of this view is given below.

"... it is not an activity that i can easily do at normal times, especially in this pandemic process. I enjoyed doing this virtually because I couldn't do the real thing." (Participant 15)

Although participants often have positive opinions about what they feel after the experience, some are not satisfied with the experience they experienced for various reasons, they expressed their views. Positive opinions include the richness of experience, pleasure and pleasure of experience, and negatively, expressions that the application content makes the user feel ridiculous and causes various physical discomfort. So that during the field work, some participants were observed by the researcher, who did not feel physically comfortable having an interview immediately after the experience. After they felt comfortable, the negotiations continued. Below are some of the positive and negative views expressed by the participants at the end of the experience with quotes.

"I was nervous because I didn't know how....." (Participant 7)

During and at the end of the experience, there are participants who do not change their views on the application positively or negatively, but also those who have negative perceptions before and during the experience, but have a positive perception at the end of the experience. Participants who expressed their views in this direction stated that they had first experienced applications produced with AR and VR technology.

"I thought it was very strange at first, because it was the first time I used it. So there was a little anxiety and curiosity. I said I can't possibly... Then the app started... at first I was really confused. Then it was very impressive to see products from every angle." (Participant 10)

The results of the third theme; In the research, participants were asked about the technical, physical and psychological positives and negatives of the application produced by AR and VR technology they experienced, so that the user-led availability of the application was studied.

The Availability theme; consists of two sub-categories and a total of 34 codes, both positive and negative aspects of the application produced with AR and VR technology. Participants often express their views on the positive aspects of the applications they experience, such as providing virtual preview of a real-life event or space, allowing

them to view the environment at 360 degrees, some applications being educational and instructive, providing a safe environment and providing the user with a temporal benefit, and the example is given below.

"it provides a quick tour for those like us who don't have time. For example, I now participate in virtual fairs rather than spending time at physical fairs. This experience has provided it today." (Participant 13)

General attendee statements on the negative aspects of applications produced by AR and VR technology focus on hardware-related disturbances, high cost of applications, physically challenging aspect, individual focus problems, and short duration of implementation.

"... i think it was negative that we were unable to get information about the texture of the product from the application. This may be due to a lack of hardware." (Participant 12)

Some participants say that they experienced some problems with AR and VR technology hardware or application at the beginning of the experience, but they were able to overcome and practice these problems in the rest of the experience.

"the downside was that there seemed to be a problem with the quality of the resolution of the content, and I even told the attendant. I don't know if he had any settings, he made it very clear, and then it was okay." (Participant 19)

The results of the fourth theme; In the research, participants who have experienced applications produced by AR and VR technology were first asked if they were satisfied with the experience, so that they were able to understand the essence of the experience they had experienced.

The experience output theme; consists of two sub-categories and a total of 22 codes, to be satisfied with the experience and not satisfied with the experience. In this context, in general, during participants' experiences, realistic, three dimensions, watching, feeling of reality, adding meaning to reality, there are concepts such as being there, being real, embodiment and technology, and examples are given below.

"it felt like I could touch it with the sense of reality and being there that the marble had awakened". (Participant 8)

Although one learner has expressed a positive view of the satisfaction that he has experienced in the application itself, it states that the applications in Turkey are not yet at sufficient level in terms of hardware and content.

"I just think that those software there can move forward. I mean, I have a sense of reality that's beautiful when we look at it right now, but… since I also know very good practices abroad, I think it might be better for us, too." (Participant 8)

The results of the fifth theme; Virtual reality and promotional theme; consists of two sub-categories and a total of 16 codes, including the use of AR and VR technology-generated applications in the demonstration industry and the potential to replace a real demo experience. In the research, participants were asked what areas of the demonstration sector they have experienced can be used in and can not replace a real experience of promotion, so the relationship between AR and VR technology and the promotion sector has been determined by the perception and perspective of users. The discussions first asked participants what areas of the demonstration industry are available for applications produced with AR and VR technology. In this context, the participants were first informed if they had any information about the experience they had performed, in other words, a regenerative activity, and if they did not have any knowledge, they were informed. In addition, participants who do not have sufficient knowledge of which areas the promotion sector covers and who request information will not affect their views, only the researcher has provided a preliminary insight into which key actors are the introductory sector. Participants describe what areas of the demonstration industry are available for applications produced with AR and VR technology in the following statements.

"as a fair, you can go around a place, i.e. it can be used in the promotion of different mines. These applications can be made for certain places on domestic and overseas exhibition routes, where people can visit them, virtually with their real images… new products can be designed to provide visits." (Participant 15)

In conclusion it can be said that AR and VR usage has great potential for interior architecture/design in the means of providing alternative ways of experiencing the material in a virtual environment. This will give the designer the opportunity of demonstrating his/her design by providing more spatial experience to his/her client at

the early stages of the design process. However, the existing technologies are still deficient to provide a full experience of the reality.

Because of the Covid19 pandemic it has been difficult to organize these kind of events. This fact affects the existing study with limited data. The limited number of participants in this study is a constraint however with the selected methodology it has been possible to come up with a concrete conclusion. For further studies, it is planned to repeat the research in upcoming events and compare the results of the repeated studies that will provide an opportunity for more generalized conclusions with larger data.

Although the used digital application in the research was an AR application, because of the Covid 19 limitations it was not possible to provide an immersive experience for the participants but they have experienced the virtual fair through the computer screen which limits the experience. As a result the expected AR experience was not very efficient through the computer screen. For further studies it is aimed to repeat the experiment in an immersive way through some headset and haptic devices by locating the virtual images in a real exhibition environment which will provide a better AR experience.

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APPENDICES

APPENDIX A

SURVEY OF STUDY

Bu araştırma İzmir Ekonomi Üniversitesi Tasarım Çalışmaları Yüksek Lisans Programı kapsamında yürütülmektedir. Anket üç kısımdan oluşmaktadır, birinci kısım demografik veri elde etmeyi amaçlayan sorulardan, ikinci kısım 5 ölçekli bir değerlendirme ile sanal fuar standı deneyimi ve memnuniyet seviyesini ölçmeyi amaçlayan sorulardan ve son kısım da kişisel deneyiminize yönelik detayları anlamayı hedefleyen ve özellikle Covid-19 salgın sürecinde sanal gerçeklik deneyimiyle fuar etkinliği konusundaki değerlendirmelerini anlamaya yönelik açık uçlu sorulardan oluşmaktadır.

Araştırma kapsamında toplanan veriler tam gizlilik esasları kapsamındadır ve hiçbir şekilde üçüncü şahıs ve/veya kurumlarla paylaşılmayacaktır. İşlenmemiş veri gizli tutulacak ve yalnızca bilimsel amaçlı analiz sonuçları akademik amaçla kullanılacak, çalışma tamamlandıktan sonra tün ham veriler imha edilecektir.

BÖLÜM 1. DEMOGRAFİK VERİ

1. Cinsiyetiniz

Erkek ☐ Kadın ☐ Belirtmek istemiyorum ☐

1. Yaşınız

1. Eğitim Durumunuz

İlköğretim ☐ Lise ☐ Üniversite ☐ Yüksek Lisans ☐ Doktora ve üstü ☐

1. Mesleğiniz

BÖLÜM 2. KULLANICI DENEYİM MEMNUNİYET ANKETİ (Bu kısımdaki değerlendirmelerinizi lütfen hem VR hem AR deneyiminizi dikkate alarak yapınız)

	Kesinlikle Katılmıyorum 1	Katılmıyorum 2	Kararsızım 3	Katılıyorum 4	Kesinlikle Katılıyorum 5
Sanal gerçeklik teknolojileri (VR) kullanımını konusunda bilgim var.					
Artırılmış gerçeklik teknolojileri (AR) kullanımını konusunda bilgim var.					
Sanal gerçeklik teknolojilerinin kullanımının artmasından memnunum.					
Sanal gerçeklik teknolojileriyle hazırlanmış sunumlar, geleneksel yollarla hazırlanmış sunumlardan daha etkilidir.					
3 boyutlu mekan görselleri projelendirme mekan algısı açısından büyük önem taşır					
Sanal gerçeklik gibi üç boyutlu teknolojiler, içmekân ve boyut algısını daha kesin ve gerçekçi şekilde algılamamıza yardımcı olurlar.					
Malzemeyi doku ve renk ilişkileri ile üç boyutlu ve gerçeğe yakın bir ortamda deneyimlemek, malzeme hakkında istenilen tüm bilgileri sunar.					
Malzeme kullanımını üç boyutlu ve gerçeğe yakın bir ortamda deneyimlemek, tasarım kararları ve malzeme seçimlerinde hata payını en aza indirir.					
Malzeme kullanımını, sanal bir iç mekanda değil, gerçek bir iç mekan üzerinde üç boyutlu bir şekilde görebilmeyi tercih ederdim.					

İkili iş görüşmelerinde kullanılan sanal gerçeklik uygulamasından memnun kaldım.					

Sanal fuar gezintisinde kontrol tamamen bendeydi				
Sanal fuar ortamı fuar deneyim beklentime cevap verdi				
Gerçekçi bir görsel deneyim yaşadım				
Bu duyuları tüm duyularıma hitap etti				
Sanal fuarın görsel özelliği beni içine aldı				
Sanal fuar içindeki deneyim doğala yakın bir deneyim sundu				
Sanal fuar içindeki deneyim gerçek deneyimle uyumsuzdur				
Sanal fuar ortamını çok aktif biçimde kullanabildim				
Sanal fuar içinde hareket etmek zorlayıcıydı				
Sergilenen nesnelere (mermerlere) kolaylıkla çok yakından bakabildim				
Sergilenen nesnelerin (mermerlere) farklı açılardan bakabildim				
Sanal fuar ortamına adaptasyonda zorlandım				
Sanal fuar dikkat dağıtıcı bir deneyimdir				
Sanal fuar ortamındaki hareketlerime yazılım her hangi bir gecikme olmadan hızlı tepkiler verir				

Sanal fuar deneyimine hemen adapte oldum				
Deneyimim sonunda sanal fuar ortamında daha rahat ve güvenle hareket edebilir oldum				
Arayüz olarak akıllı telefon/tablet ekranından yapılan sanal fuar deneyimi gerçekçilik bakımından kısıtlayıcıdır				
AR deneyimi VR deneyimine göre daha gerçekçi bir his vermektedir				
Sanal ortamın içinde olabileceğim (çevreleyici-immersive) sanal ortamı tercih ederim				

BÖLÜM 3. SANAL FUAR DENEYİMİNİZE İLİŞKİN KİŞİSEL GÖRÜŞLERİNİZ

1. Bilgisayar oyunu oynar mısınız, oynarsanız hangi tip oyunları tercih edersiniz? Lütfen açıklayınız.

1. Bu deneyim öncesi, herhangi bir sanal gerçeklik teknolojisiyle (VR, AR, MR vb.) deneyiminiz oldu mu? Olduysa kısaca açıklayınız.

1. Sanal gerçeklik teknolojilerini (VR) veya türevlerini (AR,MR) fuar sektöründe kolaylık sağlayıcı olumlu bir teknolojik gelişme olarak yorumlar mısınız? Cevabınız evet ise kısaca açıklayınız.

1. Sanal gerçeklik teknolojilerinin (VR) veya türevlerinin (AR,MR) fuar sektöründe olumsuz etkileri olabileceğini düşünüyor musunuz? Yanıtınız evetse açıklayınız.

1. Bu deneyiminizi dikkate alarak, sanal gerçekliğin kullanılıyor olmasından memnun kaldınız mı? Lütfen açıklayınız.

1. Covid-19 salgını bulunmasaydı, sanal gerçeklik tanıtım yöntemini geleneksel tanıtım yöntemlerine tercih eder miydiniz? Lütfen açıklayınız.

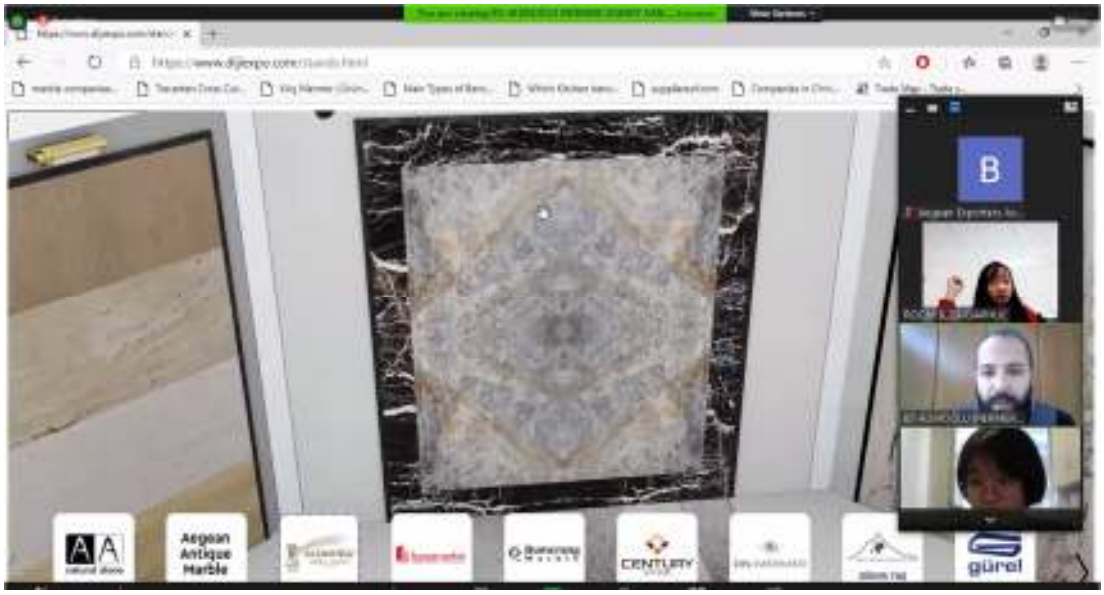
1. Belirtmek istediğiniz diğer görüşleriniz var mı?

APPENDIX B

PHOTOS OF THE EVENT

B1: Virtual Marble Fair Application Opening Screen

B2: Use of Marble Fair Application (VR) 1



B3: Use of Marble Fair Application (VR) 2

B4: Use of Marble Fair Application (AR) 3

B5. Use of Marble Fair Application (AR) 4

APPENDIX C

ETHICAL APPROVAL

SAYI : B.30.2.İEÜ.0.05.05-**020**-*147* 18.06.2021

KONU : Etik Kurul Kararı hk.

Sayın Prof. Dr. Osman Demirbaş ve Dilan Bahar Ceylan,

"The Application of Augmented Reality Technology in Interior Architecture/Design Practice " başlıklı projenizin etik uygunluğu konusundaki başvurunuz sonuçlanmıştır.

Etik Kurulumuz 18.65.2021 tarihinde sizin başvurunuzun da içinde bulunduğu bir gündemle toplanmış ve Etik Kurul üyeleri projeleri incelemiştir. Projenizin 3.3 bölümünde kullanılacağı belirtilen niteliksel veri analizi yönteminin yanında niteliksel yöntemlere de yer verildiği görüldüğünden bu hususun değiştirilmesi tavsiye edilmiştir.

Sonuçta 18.06.2021 tarihinde **"The Application of Augmented Reality Technology in Interior Architecture/Design Practice"** konulu projenizin etik açıdan uygun olduğuna oy birliği ile karar verilmiştir.

Gereği için bilgilerinize sunarım.

Saygılarımla,

[redacted]

Prof. Dr. Murat Bengisu

Etik Kurul Başkanı

C1: Approval Letter From the University

APPENDIX D

PERMISSION

EGE İHRACATÇI BİRLİKLERİ

Sayı : 75577333-TİM.EİB.GSK.00.2/3896
Konu : Dijital Platform Hizmeti

İzmir, 20/04/2021

İZMİR EKONOMİ ÜNİVERSİTESİ
LİSANSÜSTÜ EĞİTİM ENSTİTÜSÜ

Ege Maden İhracatçıları Birliği tarafından, 24-26 Kasım 2020 tarihlerinde gerçekleştirilen Vietnam Sanal Doğaltaş Ticaret Heyeti kapsamında online olarak ikili iş görüşmeleri gerçekleştirilmiştir. Bu kapsamda alınan dijital platform hizmeti verilerinin, enstitünüz Tasarım Çalışmaları Yüksek Lisans Bölümü öğrencisi Dilan Bahar Ceylan'ın yüksek lisans tezi için kullanılması uygun görülmüştür.

Bilgilerinizi rica ederim.

[redacted]

e-imzalıdır
Çiğdem ÖNSAL
Genel Sekreter Yrd.

[redacted]

D1: Permission Letter for The Use of Data