



(ISSN: 2587-0238)

Kuloğlu, A. & Akpınar, B. (2023). Metaverse ecology, avatar and digital schizophrenia, *International Journal of Education Technology and Scientific Researches*, 8(22), 738-754.

DOI: <http://dx.doi.org/10.35826/ijetsar.583>

Article Type (Makale Türü): Research Article

METaverse ECOLOGY, AVATAR AND DIGITAL SCHIZOPHRENIA

Ayşenur KULOĞLU

Associate Professor, Firat University, Elazığ, Turkey, adonder@firat.edu.tr
ORCID:0000-0003-0217-8497

Burhan AKPINAR

Professor, Firat University, Elazığ, Turkey, bakpinar@firat.edu.tr
ORCID:0000-0003-3509-0475

Received: 16.01.2023

Accepted: 20.05.2023

Published: 01.06.2023

ABSTRACT

The aim of this research is to determine the perceptions of software engineering students about digital schizophrenia caused by metaverse ecology. The research in the server model was carried out on 450 students studying at the Faculties of Engineering and Technology of Firat University in the 2021-2022 term. The data were collected with the scale developed by the researchers. The 20-item scale has sub-dimensions of "Perception of Virtual Environment", "Avatar's Self Representation" and "Avatar's Self-Symptoms". The results of the analysis of the data collected by the scale are as follows: The virtual ecology awareness of the students participating in the research is moderate. This may be related to the fact that the students are members of Generation Z. Because ontologically, the self of generation Z, which can exist in virtual environments, is mediated by digital technology. These students have the perception that the avatar represents their true selves at a moderate level. Accordingly, it can be stated that the avatar affects the real self of the individual by inverting the brain functions. These effects may lead to illusions of reality-virtuality, delusions and digital schizophrenia in the individual. As a matter of fact, according to these students, avatar causes self-symptoms at a moderate level. In the face of this situation, it is inevitable to reposition the pedagogy directly related to the self and identity development of the individual. Because in the Digital Age, the way of learning and existence of the young people of Generation Z, who exist in the ontological oscillation between the virtuality-reality poles, can be virtual ecologies such as the metaverse. Therefore, in order to raise an emotionally and cognitively healthy generation, the transformation of pedagogy into digital pedagogy and psychology into cyber psychology should be discussed.

Keywords: Metaverse, virtual self, avatar, digital schizophrenia, virtual ecologies.

INTRODUCTION

The dominant dynamics of the 21st century are speed and new generation internet-based virtual-digital technologies. Thus far, these technologies have functioned as a “supporting tool” in education and life. However, metaverse-like virtual-digital ecologies, the combination of these technologies, have surpassed the function of a tool and have evolved into an ontological life or existence space for the educational environment and the individual. There are many philosophical, pedagogical, psychological and social consequences or symptoms of this evolution which transforms education and daily life into a decentralized virtual environment by separating the boundaries of time and space in some aspects. Even though the metaverse-like virtual ecologies have some advantages in education and daily life practices, they raise serious doubts in terms of such basic human qualities as identity and personality, which are (Dionisio et al., 2013). The present study focused on the individual's avatar (virtual self) and its possible symptom, digital schizophrenia based on a pedagogical and psychological perspective. This problem is connected to the possible self-crisis of the individual existing in virtual environments, such as the metaverse, with an avatar. In this sense, studies in the literature reveal that contemporary individuals, who exist in virtual environments and are named as the Generation Z due to use of digital technology, experience ontological self and identity problems over time (Böçkün, 2021; Okur & Özkul, 2015; Özdemir & Yıldırım, 2019; Zafer & Vardarlier, 2019). If these problems are not noticed and managed adequately, they can lead to psychological symptoms such as schizophrenia (Polat, 2010: 9), which refers to the perception, thought and emotion disorder in the individual, and "digital schizophrenia" (Akçay Bekiroğlu & Hülür, 2016) in the context of digital technology.

Currently, in so-called Digital Age, *the individual with a digital technology-mediated self* mostly are present in social media or virtual media such as metaverse for communication, game or education purposes. In this ontologically new situation, an individual is represented with his/her "profile" in social media, whereas in metaverse-like 3-dimensional virtual ecologies, he/she is mostly represented with his/her "avatar". The individual exists in this spaceless, timeless and placeless virtual environment with his/her avatar created through "self-determination" (Maloney, 2021). Avatar (Cirit, 2021:33), which means the transcendent being that solves the chaos in mythology, refers to a three-dimensional character (Lee, 2021), representing the individual in the virtual-digital environment, and the digital representation or virtual self of the individual. The representation of the individual with his/her own avatar in the virtual environment is, in a sense, the presentation of the self in the virtual environment since the individual creates his/her avatar generally to introduce himself/herself to the virtual audience and to get and approval (Çakmak & Baş, 2017). Thus, in terms of self-presentation, the avatar represents the *ideal self* that the individual wants to achieve in real life but fail (Nagy & Koles, 2014a cited in Sabah, 2017:119). This virtual self (avatar), also known as the extended self (Sabah, 2017), allows the individual to connect to the world and other people via the internet (Çingay, 2015:115). Thus, the virtual self is formed through digital technology, both by preferences of the individuals and by the contribution of virtual audience. Since the individual may create numerous avatars in the virtual environment for reasons such as the search for multiple identities, she may also have many *digital technology-mediated selves*. A closer look at the process

shows that the transformation of the individual's real self into a *digital technology-mediated virtual self* occur through *contactless and disembodied communication* since communication (digital communication) and the culture (digital culture) shaped by this communication are key concepts in the formation of the self (Mead, 1970 as cited in: Irmak, 2015: 23). Thus, in McLuhan's words, the individual constructs his/her avatar, that is to say his/her virtual self or selves, which are digital representations, with virtual-digital communication images and messages by himself/herself (cited in Utma, 2018). Thus, the self of the individual of the Digital Age oscillates between reality and virtuality.

The virtual self, which the individual forms in a disembodied and contactless manner, with digital communication images and messages through avatars in the virtual environment, is psychologically and cognitively (pedagogically) problematic due to the incompatibility of reality and virtuality as the individual, ontologically existing in the virtual environment, will be divided between his/her real and virtual self as he/she loses the unity time-space-dimension. The division between virtual and real space can pave the way to distortions in perception, thought and behavior by causing reality ruptures in time. Reality-related perception, thought and behavior disorders can lead to *delusions and hallucinations* in the individual, and may lead to psychological symptoms such as schizophrenia and "*digital schizophrenia*" through digital technology (Akçay Bekiroğlu & Hülür, 2016: 154-155). These symptoms are related to the distorting of time, place and space, which play an effective role in the formation of the individual's self, in virtual ecologies due to the fact that there is a gap between the real self, existing in time, place and space in real life, and the *disembodied virtual self* (avatar), which is created through technology in a timeless, spaceless and decentralized virtual environment and has no physical reality (Gaafar, 2021; Göker, 2017). Because of this gap, being represented and existing with an avatar (virtual self), which is a virtual entity with no physical reality, is considered to be "pathological in terms of classical psychology literature" (Wolfendale, 2007 cited in Sabah, 2017:130). Furthermore, this disembodied virtual self (avatar) with no physical reality, can spread to the real self of the individual (Yee & Bailenson, 2007 cited: Oflazoğlu & Sabah Çelik, 2020:12) and can lead to illusions in his/her perception, thought and cognition. Hence, the virtual self (false identity), which does not exist in reality, can develop into an object that threatens the real existence of the individual (Sucu, 2014).

On the other hand, the *immortal, powerful and ideal self-like* avatar presented by virtual environments such as the metaverse may lead to shocks in the psychology of the individual who cannot find such things in real life. As a result, the avatar created by the individual's real self for unknown audience in the virtual environment encompasses a number of psychological and pedagogical symptoms (Semiz, 2019). First, since the avatar means an escape from reality, it can lead to erosion in the individual's perceptions and thoughts about reality. In this respect, it is controversial whether the avatar, also expressed as a *deviation from the real self* (Suh, 2013), is whether an encroachment or a reflection of the individual's real self (Jones, 2006), or merely a "communication object" (Wolfendale, 2007; cited in Sabah, 2017:122). Second, the possibility of the "*killing, hitting, powerful avatar*" character in virtual games to penetrate into real life by settling in the subconscious is frightening (Çingay, 2015: 50). Furthermore, the creation of multiple virtual selves (avatars) based on audiences the identities of

whom are unknown and the bodies of whom are not seen in the virtual environment, or based on the technological contexts in this environment, may result in self-cleavage and identity confusion. The irony here is that the individual who escapes from real-life restrictions through the avatar (Sabah, 2017), which is the easiest way to escape from reality on the internet (Wolton, 1998 cited in Sarpay, 2016: 36), is this time at risk of being caught in virtual captivity (Baudrillard, 1991 cited in Balay, 2019: 238). In Sartre's terms, dependence on the objectifying gaze of the "other" is actually a psychological and cognitive symptom since the state of existence with surveillance transforms the individual into a low profile, insignificant virtual entity over time (Çingay, 2015). Besides, the low profile and insignificant self may pave the way to self-problems by harming self-esteem which is defined as "attitudes we like or dislike in ourselves" (Cengil, 2009). Bearing in mind that the "self" is the main source of human perception (Maloney, 2021: 14), cognition and behavior, these symptoms can lead to schizophrenia (Summakoğlu & Ertuğrul, 2018:43), which is related to self-esteem and delusions, emotions and thoughts, and to "digital schizophrenia", a virtual version of schizophrenia (Akçay Bekiroğlu & Hülür, 2016). Self-problems, such as digital schizophrenia, can contaminate the individual's social life over time by increasing stress and conflict (Erikson, 1968 cited in Yıldız, 2006: 88) because self-problems are directly related to the socialization of the individual (Bulduklu & Koçak, 2021: 6333).

In today's world, and partially in Türkiye, which has turned into a global network (TÜİK, 2021; Eryılmaz & Bal, 2019), metaverse-like virtual-digital technologies, which are the reflection of this network, cannot be avoided due to the aforementioned psychological symptoms. Hence, it is highly unlikely to remove virtual-digital technologies from our lives because of these symptoms. Especially for today's young generation, known as the Generation Z, who exists in internet-based virtual channels and has a digital technology-mediated self, this is completely impossible. In this case, it is essential to learn to live in balance with the realities of the Digital Age in the form of internet technologies and virtual ecologies. Therefore, first of all, the disciplines of pedagogy and psychology, which are directly related to the self and identity construction of the individual, need to be transformed on the basis of the paradigms of the Digital Age. In this transformation, pedagogy, which is compatible with metaverse-like virtual-digital ecologies and aims to build a balanced self and identity in the individual, may be positioned as "digital pedagogy" and psychology as "cyber psychology". In this case, the disciplines of pedagogy and psychology should be positioned in accordance with the search for "the attraction of the avatar (virtual self) for today's individual and the individual's self-determination by avatar" (Maloney, 2021:9-10). Otherwise, it is not reasonable to just complain and let the virtual-digital technologies evolve our youth towards psychological, cognitive and social uncertainties (Çingay, 2015) for the reason that children and young people, the target audience of pedagogy, are the people of the Digital Age existing in the oscillation of reality and virtuality. The way they exist and learn may be these virtual channels and ecologies. Hence, the digital pedagogy and cyber psychology of this age, which will raise individuals with a healthy and balanced self-structure, should be based on this balance of reality and virtuality. Otherwise, "considering only the non-virtual part of the individual will not be enough" in the self-construction of the individual (Nagy & Koles, 2014, Belk, 2013 cited in Sabah, 2017:119). At this point, this study, the aim of which was to examine the perceptions of higher education students towards the problem of digital schizophrenia as a possible symptom of the avatar (virtual self) in the

metaverse ecology, is significant since, in order to face the virtual self and digital schizophrenia phenomenon, first of all, the framework of the problem must be determined. Thus, higher education students, who are primarily the addressees of the problem and who exist in virtual channels, seem to be an appropriate selection. Among these students, the opinions of those who study virtual and digital technologies and have metaverse experience can be a guide for the identification and solution of the problem.

METHOD

Universe and sample

The universe of this research consisted of 1651 undergraduate students studying at Firat University Faculty of Engineering (n=413) and Faculty of Technology (n=1238) Software Engineering Department in the 2021-2022 Spring Term. The criterion sampling, a purposive sampling method, was used in sample selection. In criterion sampling, a number of predetermined criteria are used in order to select sample (Yıldırım & Şimşek, 2016). The criteria used in the research were: voluntary participation, having knowledge about virtual-digital technologies and having experience in metaverse ecology. The study was carried out in two stages as scale development (EFA and CFA) and the application of the developed "Metaverse Ecology and Virtual Self Scale for Students" (MEVSSS). In the first stage, 210 software engineering students who volunteered to participate in the study were included in EFA sample. In addition, 241 software engineering students who volunteered to participate in the study were included in CFA sample. In the second stage of the study, MEVSSS, whose validity and reliability were ensured and Cronbach's Alpha was calculated, was administered to 505 software engineering students (Study Sample) who voluntarily participated in the study. Table 1 shows the distribution of the study.

Table 1. Demographic Distribution of the Study Sample to Whom MEVSSS was Applied

Variables	Categories	Frequency (n)	Percentage (%)
Gender	Female	162	40
	Male	243	60
Faculty	Engineering	185	45.7
	Technology	220	54.3
Grade	1. Grade	84	20.7
	2. Grade	137	33.8
	3. Grade	110	27.2
	4. Grade.	74	18.3
Total		405	100

The development of the data collection tool

In the study, the data were collected using MEVSSS developed by the researchers. The following stages were followed in the development of the scale. First, a draft was established through a literature review. The items in this draft were presented to six 4th Grade software engineering students (three from the Faculty of Engineering and three from the Faculty of Technology) who were not included in the study, and the appropriateness of the

items was examined. Based on the feedback, an item pool consisting of 40 items was developed. Then, to examine content and face validity, expert opinion was obtained regarding the item pool. The experts were 7 faculty members at Firat University Engineering Faculty and Technology Faculty Software Engineering Department (1 Prof. Dr., 2 Assoc. Prof. Dr., 3 Ass. Prof. Dr., 1 Res. Ass.). In line with the opinions and suggestions from the experts, 5 items were eliminated due to clarity and comprehensibility, and a draft scale of 35 items was developed for EFA stage. The draft scale was applied face-to-face to 240 software engineering students (EFA Sample) who voluntarily participated in the study and were not involved in the Study Sample. However, 213 scale forms were returned and three of them were excluded due to incomplete and incorrect filling. Thus, a total of 210 draft scale forms were entered to SPSS Package Program for EFA. Similarly, the model emerged as a result of EFA was applied face-to-face to a 250 software engineering students (CFA Sample), who also voluntarily participated in the study and were not involved in the Study Sample, for CFA. A total of 246 forms were returned, and 5 of them were excluded due to incomplete or incorrect filling, resulting in a total of 241 forms. These forms were entered into SPSS Package Program for DFA. The results of the analysis are given below. This study was approved by the decision numbered 169337 meeting dated 12/04/2022 in line with the decisions of the Scientific Research and Publication Ethics Committee of Firat University.

In EFA, the factor structure of the MEVSSS was examined. In the analysis, it was taken into consideration that the factor loadings of the items were at least “.30”, and the difference between the items with sufficient loading values in two different factors was “.10” and above (Büyüköztürk, 2012; Tavşanlı, 2010), and the factor loading was applied as 0.50. Based on the factor analysis, 15 items that did not have appropriate loading value or overlapped were removed, and as a result, MEVSSS consisting of a total of 20 items were developed. Scree plot of the scale is also shown in Figure 1.

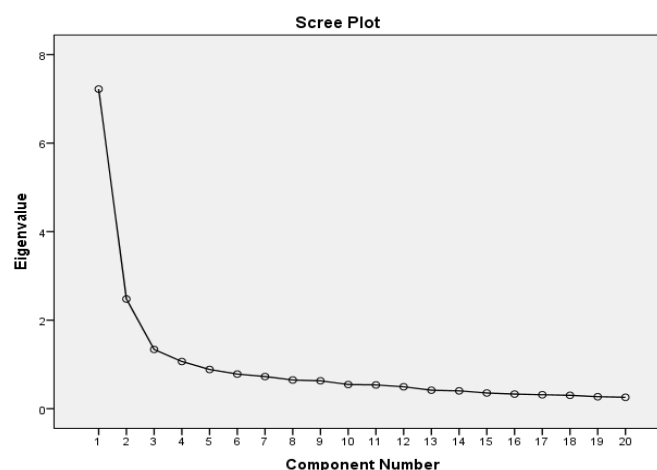


Figure 1. Scree Plot of MEVSSS

As seen in Figure 1, the difference between the eigenvalues decreased after 3rd Factor, and the effect of the following factors on the variance decreased and they got closer to each other. In addition, when the rotated component matrix showed that the highest factor loadings were obtained in three factors. The examination of the eigenvalues, rotated component matrix, and scree plot revealed that MEVSSS had three factors. The common

variance of the items as a result of EFA and the item loadings values after Varimax rotation are presented in Table 2.

Table 2. MEVSSS Factor Analysis Results

Items	Factor 1	Factor 2	Factor 3
S1			,778
S2			,762
S3			,718
S4			,585
S14	,732		
S15	,638		
S18	,534		
S19		,647	
S20		.681	
S21		.813	
S22		.743	
S23		.711	
S26		.506	
S28	,557		
S30	,608		
S31	,781		
S32	,732		
S33	,762		
S34	,597		
S35	,577		
<i>Eigenvalue</i>	4.869	3.262	2.906
<i>Variance(%)</i>	24.347	40.657	55.188

Three dimensions of MEVSSS revealed by EFA were named in line with the items they covered. Accordingly, 1st Dimension, consisting of ten items (Items 14, 15, 18, 28, 30, 31, 32, 33, 34, 35), was named as "Avatar's Representation of the Self" (ARS). The 2nd Dimension, involving six items (Items 19,20, 21, 22, 23, 26), was named as "Avatar's Symptoms of the Self" (ASS), and the 3rd Dimension, including four items (Items 1,2,3,4) as "Virtual Environment Perception" (VEP). MEVSSS, consisting of all three dimensions, explained 62,764% of the total variance. In ABT, the first dimension of the scale, factor loadings varied between .534 and .762 and it explained 24.347% of the variance. The second dimension, ASS, explained 40.657% of the variance and factor loadings ranged between .506 and .813. In VEP, the third dimension of the scale, factor loadings were between .585 and .778, and it explained 55.188% of the total variance. All of the items in the scale were 5-point Likert type and scaled as "5=strongly agree", "4= agree", "3=partially agree", "2=disagree" and "1=strongly disagree". A high score in each sub-dimension of the scale indicates a high level of perception of the dimension, and a low score indicates a low level of perception of the dimension.

CFA was used to test structure revealed by EFA. Accordingly, the three-dimensional and 20-item MEVSSS was administered face-to-face to CFA sample (n=405). Figure 2 shows the model emerged as a result of the CFA.

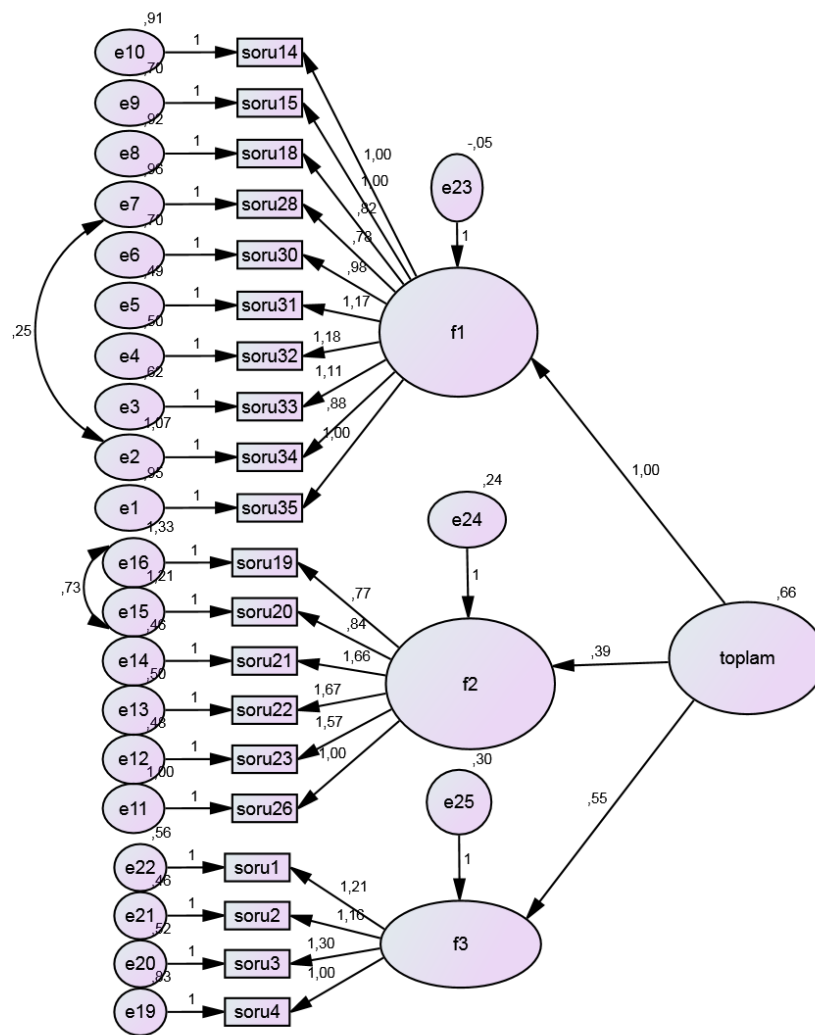


Figure 2. CFA Model of MEVSSS

The fit indices of the model revealed by CFA are given in Table 3.

Table 3. Fit indices of MEVSSS

Model fit indices	Perfect Fit Values	Acceptable Fit Values	MEVSSS
X ² /sd	0 < X ² / sd < 2	2 < X ² / sd < 3	2,605
RMSEA	0.00 < RMSEA < 0.05	0.05 < RMSEA < 0.10	,063
PGFI	0.95 < PGFI < 1.00	0.50 < PGFI < 0.95	,714
GFI	0.85 < GFI < 1.00	0.90 < GFI < 0.95	,903
AGFI	0.90 < AGFI < 1.00	0.85 < AGFI < 0.90	,878
IFI	0.95 < IFI < 1.00	0.90 < IFI < 0.95	,925
NFI	0.95 < NFI < 1.00	0.90 < NFI < 0.95	,884
CFI	0.95 < CFI < 1.00	0.90 < NFI < 0.95	,925

Table 3 showed that the fit values of the structure obtained as a result of CFA were in the perfect fir and acceptable fit range (Sümer, 2000; Schermelleh-Engel & Moosbrugger, 2003; Wang & Wang, 2012, Kline, 2005;

Tabachnick & Fidell, 2012; Thompson, 2004). In this sense, the goodness-of-fit indices of the model in Figure 2 were acceptable. Thus, the construct validity and model accuracy of MEVSS were ensured. In addition, Cronbach’s Alpha, calculated to investigate the reliability of the scale, was found as 0.899 for the total scale, .885 for ARS, .802 for ASS and .816 for VEP. A Cronbach's Alpha value of “.70” and above shows that the scale is reliable (Sipahi, Yurtkoru, & Zinc, 2010). Accordingly, MEVSSS was found to be reliable and could be used in the study.

Data analysis

MEVSSS, whose validity and reliability was ensured, was applied face-to-face to a total of 405 software engineering students (Study Sample). Before the analyses, the normality of the data was examined. The normality test indicated that the skewness and kurtosis values of the data ranged between -.269 and .333. The fact that the skewness and kurtosis values of the data are between -1 and +1 indicates that the data has a normal distribution (Büyükoztürk, 2012). In this sense, the data in the study was considered normally distributed and thus parametric tests were used. In the analysis of data, arithmetic mean, standard “t”-test and ANOVA were employed. P=0.05 was accepted for significance in the analyses.

FINDINGS

Findings on virtual environment perceptions

The participants’ perceptions on virtual environment of metaverse and the distribution of their perceptions in line with demographic variables are presented in Table 4.

Table 4. Virtual Environment Perceptions (VEP) and Comparison of the Perceptions by Demographic Variables

Sub-dimensions	Variables	Perception					
		N	X	S			
VEP		405	2.51	.69			Moderate
VEP	Gender	N	X	S	t	p	Difference
	Female	162	2.43	.90	-1.483	.139	----
	Male	243	2.57	.91			
VEP	Grade	N	X	S	F*	p	Difference
	1. Grade(a)	84	2.34	.72	5.135	.568	a-c
	2. Grade (b)	137	2.42	.87			
	3. Grade (c)	110	2.65	.79			
	4. Grade (d)	74	2.55	.96			
VEP	Faculty	N	X	S	t	p	Difference
	Engineering	185	2.43	.91	-1.736	.083	----
	Technology	220	2.58	.90			

In order to investigate *the perception of metaverse-like virtual environment*, Virtual Environment Perception (VEP), which is the sub-dimension of MEVSSS used in the study, was examined. Table 4 showed that participants’ virtual environment perceptions were moderate ($x_{SOA}=2.51$). Accordingly, it was found that the participants, who could be considered as the Generation Z as of their age (Deniz & Tutgun Ünal, 2019), had a moderate 3D virtual

ecology awareness. Considering that the participants had a moderate level of metaverse-like virtual ecology awareness, it can be argued that they had moderately positive attitudes towards virtual ecologies.

Independent samples “t” test and One-Way ANOVA were performed to test whether there was a significant difference in the virtual environment perceptions of the participants regarding gender, grade and faculty. The results revealed that even though the participants’ virtual environment perceptions did not differ by gender and faculty, there was a significant difference in terms of grade ($F=5.135$; $p<.05$). The Scheffe Test, performed to reveal the source of the difference, indicated that 3rd Grade participants ($X_{(c)}=2.69$) had significantly higher levels of virtual environment awareness than 1st Grade participants ($X_{(a)}=2.33$).

Findings on avatar’s representation of the self in the metaverse virtual environment

The participants’ perceptions on the avatar’s representation of the self and the distribution of their perceptions regarding demographic variables are shown in Table 5.

Table 5. The Participants’ Perceptions of Avatar’s Representation of the Self (ARS) and Comparison of Their Perceptions by Demographic Variables

Sub-dimensions	Variables				Perception Level		
		N	X	S			
ARS		405	2.42	.84		Moderate	
ARS	Gender	N	X	S	t*	p	Difference
	Female	162	2.29	.80	-2.336	.020	a-b
	Male	243	2.49	.84			
ARS	Grade	N	X	S	F	p	Difference
	1. Grade(a)	84	2.44	.90	.823	.482	----
	2. Grade (b)	137	2.33	.81			
	3. Grade (c)	110	2.50	.80			
	4. Grade (d)	74	2.44	.81			
ARS	Faculty	N	X	S	t	p	Difference
	Engineering	185	2.35	.83	-1.465	.144	----
	Technology	220	2.47	.82			

To examine *the perception of avatar’s representation of the self*, Avatar’s Representation of the Self (ARS), a sub-dimension of MEVSSS, was investigated. Table 5 revealed that the participants had a moderate level of perception on the avatar’s representation of the self ($X_{ABT}=2.42$). In addition, it was also tested whether there was a significant difference between students’ perceptions of the ARS sub-dimension regarding demographic variables. As shown in Table 5, although there was not a significant difference among the participants in terms of grade and faculty, their avatar’s representation of the self-perceptions differed significantly by gender ($t=-2.336$; $p<.05$). It was found that male participants ($X_{(b)}=2.49$) had significantly higher levels of avatar’s representation of the self-perceptions than female participants ($X_{(a)}=2.29$).

Findings on Avatar’s symptoms of the self in the metaverse virtual environment

Table 6 shows the participants’ perceptions of symptoms of the self caused by the avatar in the metaverse virtual ecology, and the distribution of these perceptions regarding demographic variables.

Table 6. The Participants’ Perceptions of Avatar’s Symptoms of the Self (ASS) and Comparison of Their Perceptions with Regard to Demographic Variables

Sub-dimensions	Variables	Perception Level					
		N	X	S			
ASS		405	2.47	.69		Moderate	
ASS	Gender	N	X	S	t	p	Difference
	Female	162	2.47	.83	.132	.895	---
	Male	243	2.46	.83			
ASS	Grade	N	X	S	F	p	Difference
	1. Grade(a)	84	2.51	.92	.247	.864	----
	2. Grade (b)	137	2.47	.86			
	3. Grade (c)	110	2.48	.73			
	4. Grade (d)	74	2.47	.87			
ASS	Faculty	N	X	S	t	p	Difference
	Engineering	185	2.49	.83	-1.736	.083	----
	Technology	220	2.45	.85			

In order to examine participants’ *perceptions of symptoms of the self caused by the avatar*, Avatar’s Symptoms of the Self (ARS), a sub-dimension of MEVSSS, was examined. Table 6 showed that the participants had a moderate ($X_{ABS}=2.47$) level of perception that the avatar caused their symptoms of the self. Furthermore, in order to reveal whether the participants’ ASS scores differed by demographic variables, independent samples t-test and One-Way ANOVA were performed. The results showed that there was not a significant difference in the participants ASS scores regarding gender, grade and faculty.

CONCLUSION and DISCUSSION

In today’s Digital Age, digital and virtual technologies penetrating every field and stage of life transform the society as a whole, while transforming people into digital people with names such as digital native or digital immigrant (Küçükvardar, 2019: 2). Metaverse-like virtual-digital ecologies ensure this evolution through technology-mediated communication and avatar. Higher education students, who are considered ontologically as Generation Z, are more exposed to this evolution because of their birth date and their existence in virtual media (Kırıklı & Köyüstü, 2018). Although digitalization reflects the "spirit of the time" and is unavoidable, it cannot be predicted what the pedagogical, psychological and social consequences of the individual's evolution into digital human beings will be in the future. These uncertainties are worrying for the younger generation having digital technology-mediated self because ontological existence of this generation, whose self and identity *oscillate between reality and virtuality*, seems to be in a state of uncertainty. This state of purgatory, resulting from the gap between the real space and time, and the spaceless and timeless virtual environment, pave the way to discordancy between the virtual self and the real self of the individual. In this sense, there is a significant incompatibility between the avatar (ideal self), which is created by the individual as a self-presentation and is the virtual self of the individual, and the real self of the individual in terms of time, space, dimension and speed. This incompatibility, leading to fractures in the individual's self-perception, may result in psychological symptoms such as depression, low self-esteem and anxiety disorder (Küçükvardar, 2019: 60-61). If the required precautions are not taken, it is possible that these symptoms will have an impact on the individual’s perceptions, thoughts

and behaviors in real life, that is to say, the real self (Çingay, 2015). These possible effects may be physiological as well as psychological. In this regard, digital technologies are reported to rapidly evolve the brain by changing the cells (Hart & Hart, 2013 cited in Küçükvardar, 2019: 59). On the other hand, since metaverse-like virtual ecologies refer to a different space and context in terms of time, speed and space (Alanka & Cezik, 2016: 550), they can lead to *delusions and hallucinations* in the individual's perception of reality. All these influences can lead to schizophrenia, which refers to disorders in perception, thinking and behavior in the individual (Öztürk, 2008 cited in İşlenen, 2012: 8) as the evident signs of schizophrenia are several delusions and hallucinations in perception and emotions (Ertuğrul, 2010 cited in Cuma, 2020: 36). This schizophrenia can be defined as *digital schizophrenia* (0000) since it is mediated through digital technology. The proliferation of virtual-digital technologies indicates that the disciplines of pedagogy and psychology will soon experience technological symptoms such as digital schizophrenia. Since this situation is inevitable, the disciplines of pedagogy and psychology need to manage the processes of this phenomenon and learn to live with it as soon as possible. This requirement reveals the need for pedagogy and psychology disciplines to transform into *cyber psychology* and *digital pedagogy*. At this point, awareness, perception and views of higher education students, who are the primary addressees of the digital schizophrenia and considered as Generation Z, are of crucial importance. The results of this study carried out for this purpose are given below:

Virtual Environment Perception (VEP) sub-dimension scores showed that participants had moderate level of virtual ecologies awareness and had positive attitudes towards virtual-digital technologies. In terms of demographic variables, this perception and attitude was higher in 3rd grade students than in 1st grade students. This may be due to the fact that knowledge of virtual and digital technologies improves as the grade level increases. Yirci & Aydoğar (2017), Som Vural (2016), and Kaya & Kaya (2014), who investigated the same issue, obtained similar results. The participants' awareness of and positive attitudes towards the virtual environment is a well-known characteristic of Generation Z, to which they belong (Yardımcı, 2021; Taş, Demirdövmöz, & Küçükoğlu, 2017). Since this generation's surfing in virtual media (Okur and Özkul, 2015:219) can, in fact, be regarded as the search for virtual self, it can be argued that participants partially considered metaverse-like virtual ecologies as "existence and life space". On the other hand, even though they were insufficient, the participants' awareness and positive attitudes towards the metaverse can be evaluated positively in terms of both their ability to develop in their profession and their adaptation to the Digital Age in which they will perform their profession because awareness of virtual ecologies is significant with regard to accessing information and communication technologies based resources (Karabacak & Sezgin, 2019).

A brief literature review on the "Avatar's Representation of the Self" shows that self and identity crisis related problems, which are among the most prominent psychological symptoms of virtual ecologies, are highly dependent on avatars (Ağaoğlu Ercan, 2019; İsmayilzada, 2017; Sabah, 2017;). In fact, avatar, which means savior *transcendent being* in times of chaos in Indian mythology (Cirit, 2021:33), is, ironically, the source of many psychological problems such as digital schizophrenia, technological addiction, and anxiety today. In the contemporary sense, the avatar, which is the representation of the self, is a three-dimensional character (virtual

self) that represents the person (real self) in the virtual-digital environment and can be described as the ideal self or extended self (Oflozoğlu & Sabah Çelik, 2020: 121). However, contrary to the individual (its owner), the nature of the avatar created by the individual through "self-determination" (Maloney, 2021:9) is not organic, but is mediated through digital technology. Accordingly, the problem arises at the point where the technology-mediated avatar reflects the real self. It was found in this study that the participants had the perception that the avatar represented their selves at a moderate level. This perception was higher in male participants. The reason for this finding may be that men are more familiar with virtual games and therefore avatars than women (Pala & Erdem, 2011; Taylan, Topal, & Ayas, 2018;). Irrespective of gender, participants' perception that the avatar represented their selves at a moderate level indicated that they did not deny the virtual self (avatar) in their ontological effort to exist (in self-construction). Although this situation was at a moderate level in the self-perceptions of the participants, it can be stated, in Matviyenko's words, that "real and virtual self are intertwined" (Matviyenko, 2010 cited in Sabah, 2017). Apparently, for the participants, the avatar was beyond just a digital representation of their fantasies that they could not experience in real life. Consequently, it may be anticipated that, for these students, who exist in an oscillation between the physical (real self) and virtual (avatar) poles, the "distinction between virtuality and reality" (Sabah 2017: 129) is not easy and this may lead to delusions in their perception. In this context, it may be claimed that the relationship between the body and the self has changed in the construction of identity of the participants, who can be considered as the Generation Z and exist through digital technologies as a requirement of this generation (Erden, 2012: 15) and as a symptom of this change, they are faced with the risk of digital schizophrenia.

In terms of Avatar's Symptoms of the Self (ASS), there are mainly two perspectives, one positive and the other negative, in the literature. Since this study focused on the negative perspective, items related to this perspective were included in the ASS sub-dimension of MEVSSS. Table 4 revealed that the participants had the perception that avatar caused self-symptoms at a moderate level. The participants' this perception supports the claim of "Internet-mediated communication affects the nature of self-presentation", pointed out by Ellison et al. (2006 cited in Akçay Bekiroğlu & Hülür, 2016: 153). This finding can also be discussed in detail in the context of the items included in the ASS sub-dimension. In this context, it was revealed that the participants regarded the metaverse environment as their living space and new environment, and that this virtual environment and avatar moderately affected their perspectives and behaviors. This finding is supported by the argument that the self and body relationship has changed with the avatar phenomenon for the Generation Z of the Digital Age, and therefore this can lead to negative psychological symptoms (Cirit, 2021).

Consequently, virtual environment and avatar can be a living space and learning path (Akpınar & Akyıldız, 2022) for the Generation Z at the age of higher education, despite its possible worrying symptoms. In addition, the avatar can be the idealizing representation of the Generation Z's selves (Armağan, 2013) and the address of this generation's need to be different (Oflozoğlu & Sabah Çelik, 2020). Actually, Münker (1997) defines the avatar as "the future of truth" (cited in Uysal, 2020: 141).

SUGGESTIONS

If this is the unavoidable reality of the Digital Age, it seems reasonable to learn to live in balance with this phenomenon instead of rejecting it futilely as Don Quixote. Therefore, the understanding of pedagogy (digital pedagogy) and psychological (cyber psychology) are certainly needed to handle metaverse-like virtual environment elements from a new perspective. For example, the avatar can be dealt with in line with its meaning of "dissolving chaos" in mythology if it is possible. In order to provide data to digital pedagogy and cyber psychology disciplines, which will be the paradigms of the Digital Age, there is a need for comprehensive studies examining metaverse-like virtual ecologies and avatar phenomena in depth in ontological (philosophical), pedagogical, and psychological and social contexts. Otherwise, a biased approach to these phenomena (digital technologies, virtuality, avatar) will make it difficult to understand them and to solve the possible problems they may cause. It should be born in mind that numerous technological phenomena that were described as "harmful" in history are among the essentials of today's life.

ETHICAL TEXT

This article complies with journal writing rules, publication principles, research and publication ethics, and journal ethics. Responsibility for any violations that may arise regarding the article belongs to the authors of this article. This study was approved by the decision numbered 169337 meeting dated 12/04/2022 in line with the decisions of the Scientific Research and Publication Ethics Committee of Fırat University.

Author(s) Contribution Rate: This first author contribution rate is 60%, second author contribution rate is 40%.

REFERENCES

- Ağaoğlu Ercan, E. (2019). Sanal gerçeklik, hakikat kavramının dönüşümü ve popüler kültürdeki yansımaları. *Türkiye İletişim Araştırmaları Dergisi*, 34, 115-143.
- Akçay Bekiroğlu, H. & Hülür, A. B. (2016). Üniversite Öğrencilerinin Facebook Kullanımı ve Dijital Şizofreni Üzerine Bir Araştırma. *OÜSBAD/SOBİAD*, Mart 2016, 146-175.
- Akpınar, B. & Akyıldız, T. Y. (2022). Yeni eğitim ekosistemi olarak metaversal öğretim. *Tarih Okulu Dergisi*, 15 (56), 873-895. Doi : 10.29228/joh.56881
- Alanka, Ö. & Cezik, A. (2016). Dijital kibir: Sosyal medyadaki narsistik ritüellere ilişkin bir inceleme. *TRT Akademi*, 1(2), 548-569.
- Armağan, A. (2013). Gençlerin sanal alanı kullanım tercihleri ve kendilerini sunum taktikleri: Bir araştırma. *Uluslararası Sosyal Araştırmalar Dergisi*, 6 (27), 78-92.
- Balay, R. (2019). "Dijital Çağın Eşiğinde Eğitim ve İnsanı Yeniden Düşünmek" (ss.238-250) içinde *Türkiye Eğitim Vizyonu üzerine Değerlendirmeler* (Ed. F. Tanhan). PEGEM AKADEMİ.
- Böçkün, B. (2021). *Problemlili internet kullanımının metakognisyonlar, olumsuz çocukluk çağı yaşantıları, aleksitimi ve dürtüsellik ile ilişkisinin incelenmesi*. (Yayımlanmamış Yüksek Lisans Tezi.) Kent Üniversitesi.

- Bulduklu, Y. & Koçak, A. (2021). Benlik saygısının gençlerin mobil telefon bağımlılığı ile ilişkisine yönelik bir araştırma. *Uluslararası Toplum Araştırmaları Dergisi* (OPUS), 18(43), 6328-6335. <https://doi.org/10.26466/opus.899200>
- Büyüköztürk, Ş., Akgün, Ö. E., Karadeniz, Ş., Demirel, F. & Kılıç, E. (2013). *Bilimsel araştırma yöntemleri*. PEGEM AKADEMİ.
- Büyüköztürk, Ş. (2012). *Sosyal bilimler için veri analizi el kitabı* (17. baskı). PEGEM AKADEMİ.
- Cengil, M. (2009). Hitit Üniversitesi İlahiyat Fakültesi 1. sınıf öğrencilerinin benlik saygısı düzeylerinin çeşitli değişkenler açısından incelenmesi. *Hitit Üniversitesi İlahiyat Fakültesi Dergisi*, 15, 77-102.
- Cirit, İ. (2021). "Avatar" (ss. 33-35) içinde *Siber Ansiklopedi* (Eds. Naci Akdemir & Can Ozan Tuncer). PEGEM AKADEMİ.
- Cuma, Y. (2020). *Ergenlerde sosyal medya bağımlılığı, ruhsal sorunlar ve sosyal beceri arasındaki ilişkinin incelenmesi*. (Yayımlanmamış Yüksek Lisans Tezi.) Sabahattin Zaim.
- Çakmak, V. & Baş, Ü. (2017). Benlik sunum aracı olarak Instagram kullanımı: Öğrenciler üzerine nitel bir araştırma. *Uluslararası Hakemli İletişim ve Edebiyat Araştırmaları Dergisi*, 17, 96-118.
- Çingay, A. (2015). *Sosyal medyanın kitleleştirici ve yalnızlaştırıcı etkisi*. (Yayımlanmamış Yüksek Lisans Tezi). Marmara Üniversitesi.
- Deniz, L. & Tutgun Ünal, A. (2019). Sosyal medya çağında kuşakların sosyal medya kullanımı ve değerlerine yönelik bir dizi ölçek geliştirme çalışması. *OPUS-Uluslararası Toplum Araştırmaları Dergisi*, 11(18), 1025-1057.
- Dionisio, J. D. N., Burns, W. G., & Gilbert, R. (2013). 3D virtual worlds and the metaverse: Current status and future possibilities. *ACM Computing Surveys*, 45 (3), 1-38.
- Erden, S. (2012). *Kültürel değişimlerin örgütlerde kuşaklararası çatışmalara etkisinin incelenmesi: Akademisyenlere yönelik bir araştırma*. (Yayımlanmamış Doktora Tezi). Onsekiz Mart Üniversitesi.
- Eryılmaz, S. & Bal, H. T. (2019). Teknoloji bağımlılığı ile rekreasyonel eğilimler arasındaki ilişki: Üniversite öğrencileri üzerinde bir inceleme. *Türk Turizm Araştırmaları Dergisi*, 3(4), 902-919.
- Gaafar, A. A. (2021). Metaverse in architectural heritage documentation & education. *Advances in Ecological and Environmental Research*, 6 (10), 66-86.
- Göker, G. (2017). Dijital heterotopyalar: "Başka" bir bağlamda yeni medya. *Selçuk İletişim*, 9 (4), 164-188.
- Irmak, M. (2015). *İlkokul ve ortaokul öğretmenlerinin mesleki benlik saygılarının belirlenmesi*. (Yayımlanmamış Yüksek Lisans Tezi). Sabahattin Zaim Üniversitesi.
- İsmayılzade, L (2017). Sanal dünyada sanal dönüşüm. *Journal of New Media*, 1(3), 227-236.
- İşlenen, F. (2012). *Şizofrenlerde yüz ve yüz ifadesi tanıma eğitimi amaçlı bilgisayar yazılımı*. (Yayımlanmamış Doktora Tezi). Akdeniz Üniversitesi.
- Karabacak Z.İ. & Sezgin, A. A. (2019). Türkiye’de dijital dönüşüm ve dijital okuryazarlık. *Türk İdare Dergisi*, 488, 319-343.
- Karasar, N. (2012). *Bilimsel araştırma yöntemi* (24. Baskı). NOBEL YAYINCILIK.
- Kaya, A., & Kaya, B. (2014). Öğretmen adaylarının dijital vatandaşlık algısı. *International Journal of Human Sciences*, 11(2), 346-361.

- Kırıklı, A. M. & Köyüstü, S. (2018). Z kuşağı konusunda yapılmış tezlerin içerik analizi yöntemiyle incelenmesi. *Gümüşhane Üniversitesi İletişim Fakültesi Elektronik Dergisi*, 6 (2), 1497-1518.
- Kline, P. (2005). *An essay guide to factor analysis*. ROUTLEDGE.
- Küçükvardar, M. (2019). *Bilişim çağında teknoloji bağımlılığı ve dijital istila üzerine bir araştırma*. (Yayımlanmamış Doktora Tezi). Marmara Üniversitesi.
- Lee, J.Y. (2021). A study on metaverse hype for sustainable growth. *International Journal of Advanced Smart Convergence*, 10 (3), 72-80. <https://doi.org/10.7236/IJASC.2021.10.3.72>
- Maloney, D. (2021). *A youthful metaverse: Towards designing safe, equitable, and emotionally fulfilling social virtual reality spaces for younger users*. (Thesis of Doctora). Clemson University.
- Nagy, P., & Koles, B. (2014). The digital transformation of human identity: Towards a conceptual model of virtual identity in virtual worlds. *Convergence*, 20(3), 276–292. <https://doi.org/10.1177/1354856514531532>
- Oflazoğlu, S. & Sabah Çelik, Ş. (2020). Avatarın kadar konu: Farklı olma ihtiyacı ve materyalizm eğiliminin genişletilmiş benlik üzerindeki etkisi. *Pazarlama ve Pazarlama Araştırmaları Dergisi*, 25, 1-19.
- Okur, D. H. & Özkul, M. (2015). Modern iletişimin arayüzü: Sanal iletişim sosyal paylaşım sitelerinin toplumsal ilişki kurma biçimlerine etkisi (Facebook örneği). *Süleyman Demirel Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 2015-1 (21), 213-246.
- Özdemir, B. & Yıldırım, G. (2019). Dijitalleşen iletişim ortamlarında kimlik inşası ve benlik sunumu: İletişim Fakültesi öğrencileri üzerine bir araştırma. *Yeni Medya Elektronik Dergi*, 3 (3), 178-191.
- Pala, F. K. & Erdem, M. (2011). Dijital oyun tercihi ve oyun tercih nedeni ile cinsiyet, sınıf düzeyi ve öğrenme stili arasındaki ilişkiler üzerine bir çalışma. *Ahi Evran Üniversitesi Eğitim Fakültesi Dergisi*, 12(2), 53-71.
- Polat, S. (2010). *Şizofreni hastaları ve kardeşlerinde düşünce bozukluğu ve aile işlevleri ile ilişkileri*. Uzmanlık tezi. Dokuz Eylül Üniversitesi Tıp Fakültesi Psikiyatri Anabilim Dalı.
- Sabah, Ş. (2017). Me, myself, and my avatar: Consumption, possessions and self between virtuality and reality. *Tüketici ve Tüketim Araştırmaları Dergisi*, 9(1), 117-154.
- Sarpay, A. (2016). *İnternet kullanımının çevresel etkileri*. (Yayımlanmamış Yüksek Lisans Tezi.) Ankara Üniversitesi.
- Schermelleh-Engel, K., & Moosbrugger, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness of fit measurement. *Methods of Psychological Research Online*, 8(2), 23-74.
- Semiz, Ö. (2019). Dijital kültür, özgürlükler ve sınırları üzerine. *Bilgi, İletişim Teknolojileri ve Enerji Dergisi*.
- Sipahi B, Yurtkoru E.S. & Cinko M.(2008). *Sosyal bilimlerde SPSS ile veri analizi*. BETA BASIM YAYIM DAĞITIM.
- Som Vural, S. (2016). *Üniversite öğrencilerinin bakış açısıyla dijital vatandaşlık göstergelerinin incelenmesi*. (Yayımlanmamış Doktora Tezi). Anadolu Üniversitesi.
- Sucu, İ. (2014). *Kullanımlar ve doyumlar yaklaşımı açısından sosyal medya sanal dünya oyunu olarak second life örneği*. (Yayımlanmamış Doktora Tezi). Maltepe Üniversitesi.
- Summakoğlu, D. & Ertuğrul, B. (2018). Şizofreni ve tedavisi. *Lectio Scientific Journal of Health and Natural Sciences*, 1(2), 43-61.

- Sümer, N. (2000). Yapısal eşitlik modelleri: Temel kavramlar ve örnek uygulamalar [Structural Equation Modeling: Basic Concepts and Applications]. *Türk Psikoloji Yazıları*, 3(6), 49-74.
- Tabachnick, B. G., & Fidell, L. S. (2012). *Using multivariate statistics*. Chapter 13 principal components and factor analysis. PEARSON.
- Taş, H. Y., Demirdövmöz, M. & Küçüköğlü, M. (2017). Geleceğimiz olan Z kuşağının çalışma hayatına muhtemel etkileri. *OPUS Uluslararası Toplum Araştırmaları Dergisi*, 7(13), 1031-1048.
- Tavşancıl, E. (2010). *Tutumların ölçülmesi ve SPSS ile veri analizi*. NOBEL YAYIN DAĞITIM.
- Taylan, H. H., Topal, M. & Ayas, T. (2018). Sakarya'daki lise öğrencilerinin dijital oyun oynama eğilimlerinin incelenmesi. *Online Journal of Technology Addiction & Cyberbullying*, 5 (1), 53-68.
- Thompson, B. (2004). *Exploratory and confirmatory factor analysis: Understanding concepts and applications*. American Psychological Association.
- TÜİK (2021). Türkiye İstatistik Kurumu. <https://www.tuik.gov.tr> (Erişim: 10.01.2021).
- Utma, S. (2018). Mahremiyet olgusu ve sosyal medyada mahremiyetin serüveni. *The Journal of International Social Research*, 11(59), 1193-1204.
- Uysal, D. (2020). *Dijital ve sanal yansımalar Wolfgang Hohlbein'in "Im Netz Der Spinnen" ve "Das Netz" Adlı Romanları*. İKSAD YAYINLARI.
- Wang J & Wang X. (2012). *Structural equation modeling: Applications using mplus: Methods and applications (s.5-9)*. JOHN WILEY & SONS.
- Yardımcı, Y. (2021). *Z kuşağının sosyal medya kullanım alışkanlıklarıyla değerlerin incelenmesinde medya okuryazarlığının önemi: Sakarya Üniversitesi İletişim Fakültesi örneği*. [Yayımlanmamış Yüksek Lisans Tezi]. Sakarya Üniversitesi.
- Yıldırım, A. & Şimşek, H. (2016). *Sosyal bilimlerde nitel araştırma yöntemleri*. SEÇKİN YAYINCILIK.
- Yıldız, M. (2006). Benlik kavramı ve benliğin gelişiminde dinin rolü. D.E.Ü. *İlahiyat Fakültesi Dergisi*, 23, 87-127.
- Yirci, R. & Aydoğar, N. (2015). Üniversite öğrencilerinin bilgi ve iletişim teknolojilerine yönelik tutumlarının bazı değişkenler açısından incelenmesi. *Ulakbilge*, 5 (18), 2175-2203.
- Zafer, C. & Vardarlıer, P. (2019). Medya ve toplum. *Selçuk Üniversitesi Sosyal Bilimler Meslek Yüksekokulu Dergisi*, 22 (2), 355-361.