

Investigating the metaverse awareness of tourism academics

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ABSTRACT

Keywords:

Metaverse,
Tourism education,
Tourism academics,
Tourism.

Metaverse has become a concept that has gained importance in the field of education and its use has become widespread. This technology is expected to guide rapid developments in the tourism education process of universities. In the light of all these expectations, it is important to reveal the awareness of tourism academics regarding the concept of metaverse and carry out academic studies on this concept to deliver qualified tourism education. The aim of this study is to determine the metaverse awareness of tourism academics working in public and private universities affiliated with the Council of Higher Education (YÖK). The data of the study were collected by using the 5-point Likert type Metaverse Scale developed by Süleymanoğulları et al. (2022) with one of the quantitative research methods, namely the survey application technique. The sample of the research consists of academics (n=402) registered in the YÖK academic system. Descriptive statistics and explanatory factor analysis of the scale were carried out to determine the demographic variables of tourism academics. Subsequently a t-test and one-way analysis of variance were conducted in line with the hypotheses formed in line with the purpose of the study. The results of the study revealed that there was a difference between the technology and social environment dimension and gender at a significant level of ($p>.05$). No significant difference was found between the other dimensions of metaverse awareness, namely lifestyle and digitalization, and gender at the ($p<.05$) significance level. No significant difference was found at the significance level in the results of the analysis of differences in the dimensions of metaverse awareness according to marital status, age groups and faculty departments. No significant difference was found between income groups and social environment dimension, technology and digitalization ($p<.05$). However, a significant difference was found between income groups and lifestyle dimension. Considering that research into metaverse and metaverse awareness in tourism education is limited, this study is expected to contribute to literature.

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1. Introduction

Metaverse are virtual environment networks that offer users digital experiences in 3D virtual environments, using innovative technologies such as virtual reality and augmented reality, and the opportunity for cultural and intellectual interaction with each other in these environments (Büyükkarabacak & Balyer, 2023). Individuals who want to use Metaverse technology join the virtual universe by generating their avatars and communicate with other users in an environment independently from the physical world (Hemmati, 2022). Those who took part in the metaverse environment emphasized that the experience was fun, attention-grabbing, educational, entertaining, exciting, soothing, interactive and stress-relieving (Göktaş & Hazarhun,

2024). The increasing interest in metaverse technology as a result of the different experiences provided to individuals by the metaverse environment has led to an increase in the market value of this technology (Şahin & Kıymet, 2024). Research carried out by McKinsey & Company (2022) reveals that the market value of Metaverse is projected to reach approximately 535 trillion dollars by 2030. The increasing market value of Metaverse has attracted the attention of major technology companies and they have accelerated their investments. As a result, technology companies have invested \$57 billion in 2021 and more than \$120 billion in five months of 2022 in metaverse technology. It is also estimated that metaverse technology will generate a market volume impact of 18039 billion to 270 billion dollars in the academic-virtual learning market, 144 to 206 million dollars in the advertising market and

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Research Paper

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108 to 125 million dollars in the gaming market. In line with these figures, the high market volume of metaverse technology has started to spread the use of metaverse in banking, advertising, cinema, film, entertainment as well as education and training activities (Alkan & Bolat, 2022). Especially recently, the delivery of some courses in the field of education in the metaverse setup is foreseen if the appropriate infrastructure environment is provided (Hazneci, 2019). Many researchers also believe that metaverse technology can be used as a new educational model in schools and universities (Hussain, 2023; Lee & Jo, 2023). Hazarhun & Tepeci (2023) stated that in the field of education metaverse-based technology can be considered as an educational environment integrated with virtual and real educational environments and enhanced by smart technologies. It is emphasized that this metaverse-based educational technology is a more effective educational tool for students in universities compared to traditional face-to-face education or conference platforms such as zoom and google meet etc. (Lee & Jo, 2023). Therefore, academics should focus on training using metaverse-based technology Journal of multidisciplinary academic tourism techniques to enable students studying at public and private universities to gain the digital competencies required in this age. Academics need to have knowledge about the infrastructure of this technology to train students using metaverse-based technology techniques. Sebastian (2022) purported that the widespread use of metaverse technology depends on its adoption by users. In this context, increasing the level of knowledge of tourism academics about metaverse technology in universities delivering tourism education is important for the comprehensive use of this technology. On the other hand, a study conducted by Hazarhun & Tepeci (2023) revealed that metaverse-based education is not yet implemented in tourism education. The metaverse awareness of academics should be increased to enable the term metaverse to be clearly understood by Tourism academics who provide associate, undergraduate and graduate education at universities and keep up with the developments in the digital transformation process and enable the use of metaverse technology in tourism education to become widespread (Göktaş & Uygur, 2024). On the other hand, an analysis of the relevant literature revealed that studies on metaverse in tourism education are limited (Lee & Jo, 2023, Ercan, 2022; Serçek & Korkmaz, 2023; Hazarhun & Tepeci, 13 2023). In the light of all this information, the aim of the study is to determine the metaverse awareness of tourism academics working in public and private universities affiliated with the Council of Higher Education (YÖK). Determining the awareness of tourism academics about the metaverse in this study will be a role guide for practitioners in the processes of using metaverse in distance tourism education. On the other hand, revealing the awareness and knowledge levels of tourism academics about the metaverse will be an important indicator of how well the concept of metaverse will be adapted to tourism education in the future processes

and how useful it will be. Finally, this study is thought to be an important guiding source for the development of the metaverse and metaverse awareness studies in tourism education, which can be characterized as a new research area, and a contribution to the related literature.

2. Conceptual Framework

The metaverse is a massively scaled and interoperable network of 3D virtual worlds rendered in real time that can be experienced simultaneously and permanently by an unlimited number of users with a sense of individual presence through the persistence of data such as identity, history, entitlements, objects, communications and payments (Ball, 2021). The transition to the metaverse - realism, ubiquity, interoperability, and scalability - focuses on progress in these four areas. "Realism" refers to the ability of metaverse users to fully adapt in an alternative space; "ubiquity" refers to the ability of users to access all transitions within the system through all digital devices they have; "interoperability" refers to the ability of users to move three-dimensional objects wherever they want and navigate through the system without interruption; and finally, "scalability" refers to the ability of the metaverse to be used by a large number of users simultaneously (Dionisio et al., 2013, pp. 28). The building blocks of the Metaverse and user avatars are shown in Figure 1 (Hollensen et al., 2022):

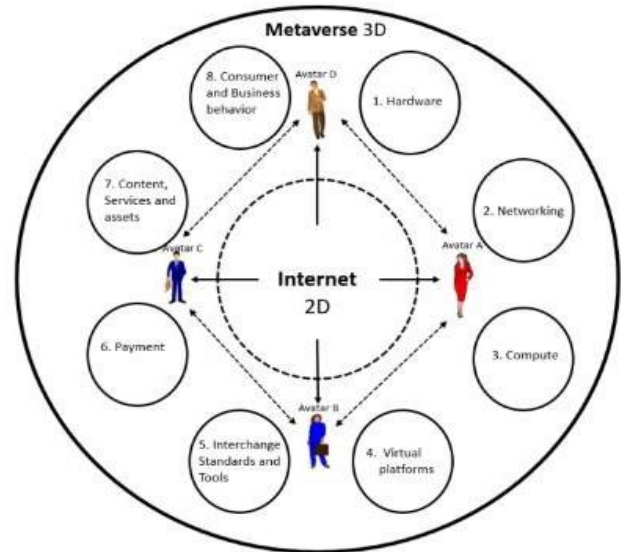


Figure 1. Metaverse building blocks and user avatars
Source: Hollensen, Kotler & Opresnik (2022)

As shown in Figure 1, the Metaverse represents an extra layer of 3D on top of the traditional 2D Internet, a 3D world where business, information and communication tools are available and interoperable. The Metaverse is a digital replica of how we operate in the physical world. Users can come together in this 3D digital space through avatars that look like them and mimic their movements so that they can interact with each other and the environment while replicating the physical world. As illustrated by the four

interacting avatars in Figure 1, users can utilize virtual and augmented reality and navigate a series of interconnected virtual worlds in the metaverse using personal avatars that interact with each other in these spaces. The metaverse places everyone inside a 'virtual' or '3D' version of the internet on an almost infinite basis. In other words, we take part in a new world order in which we are constantly 'within' the internet rather than accessing it (Hollensen, Kotler and Opresnik, 2022). "Hardware", the first of the building blocks of the Metaverse, makes it possible to enter the virtual universe. Physical technologies such as cell phones, scanning sensors, virtual reality headsets, haptic gloves, projection, industrial cameras, etc. can be described as hardware. In "Networking", the second building block of the Metaverse, it is important to pay attention to three aspects, namely bandwidth, latency and reliability. Bandwidth refers to how much data can be transferred per unit time; latency refers to the time it takes for data to travel from one point to another and back; and finally reliability is critical. The "compute" building block involves the availability and development of computing power to reinforce the metadatabase. Virtual platforms, another building block of the Metaverse, will enable many users to have access to the interface in the future. Thus, an ecosystem that allows users to socialize and explore with each other will be available. Users will be able to have a metaverse experience within this ecosystem by utilizing various tools. The 5th building block, "Exchange Standards and Tools", is a comprehensive category of protocols, formats, services and technical solutions that can interoperate with the first four building blocks mentioned above. The "Payment" building block deletes the need for a blockchain to transfer money quickly and securely, to prove and manage asset ownership. "Content, Services and Assets" covers all businesses and services related to Metaverse. The last Metaverse building block, "Consumer and Business Behavior", covers the observation of behavioral changes related to the Metaverse. For example, nowadays children can discover, learn and socialize through virtual worlds. Although children's exhibiting such behaviors in the metaverse environment can initially seem like a trend, it can be adopted as the norm in society in the future (Ball, 2021). Considering the sectoral reflections and opportunities offered by the metaverse, it is clear that the 30 entertainment, culture and tourism sectors are not indifferent to it (BTK, 2022, pp. 47). Metaverse technology is not only one of the business areas that can quickly adapt to new high technologies on the basis of tourists, businesses and destinations, it also holds potential benefits in terms of the tourism sector. The potential benefits of the metaverse include positioning it as a marketing and promotional tool in tourism, enriching consumers' experiences in the metaverse, adding value to touristic products, improving the attractiveness of existing touristic values, incentivizing users' tendency to display purchasing behaviors in terms of the tourism sector, improving booking experience and volume, and facilitating trade fairs and exhibitions (Pestek & Sarvan, 2021; Gursoy, Malodia

& Dhir, 2022; Barten, 2024). In this context, with the metaverse in the tourism sector, it becomes possible to transform physical spaces into mixed reality spaces through three-dimensional virtual environments, and thus the internet which brings all stakeholders and needs together evolves into a parallel virtual universe (Buhalis & Karatay, 2022, pp. 16).

Some of the developments in the metaverse creating initiatives of countries around the world are listed as follows:

- Various studies and projects have been carried out in Seoul, the capital of South Korea, to establish the first metaverse city in the world. These projects make it possible for visitors to visit the city's tourist attractions through virtual glasses, participate in festivals organized in the city, and even visit historical sites that have not survived to the present day. At the same time, visitors can report their wishes, suggestions and complaints to the virtual reality building. The aim is to create a virtual city with around 2.9 billion Euros invested in these projects (Gaubert, 2021). In their study, Um et al. (2022) established a connection between smart tourist cities and the metaverse and assessed smart tourism cities through case studies that will shed light on the tourism sector.
- Digital twins of cultural and historical sites have been created by the Egyptian Ministry of Tourism. Thus, an attempt has been made to establish a metaverse by creating virtual copies of touristic and historical places and sites, especially museums and pyramids, where artifacts from the Ancient Egyptian period are located (BTK, 2022, pp. 47).
- Looking at the developments in Türkiye, Meta Innovation Meeting was organized for the first time with the cooperation of the Ministry of Culture and Tourism, Meta and Xtopia. The future potential of the Metaverse and its impact on sectors were evaluated within the scope of this event and a contribution of 37.5 billion dollars to the Turkish economy until 2035 was predicted (BTK, 2022).
- A Metaverse Sectoral Analysis Workshop was held by Prof. Dr. Levent Eraslan, President of SODIMER & Türkiye Metaverse Platform and entrepreneurs of Türkiye Metaverse Platform. Problem areas in Türkiye and the world on the status of the metaverse sector were identified and solution proposals were developed. Face-to-face and online free trainings and seminars on the metaverse were organized by SODIMER & Türkiye Metaverse Platform at almost every accessible point in Türkiye. Furthermore, meetings and workshops where metaverse entrepreneurs and participants met through avatars in the metaverse environment were organized.
- As mentioned at the Meta Innovation Meeting, it was emphasized that the metaverse will cover all sectors in Türkiye, especially culture and tourism, education, e-commerce, retail, e-sports and gaming. The tourism sector is among the leading sectors in Türkiye that will

benefit from metaverse opportunities. In this context, it was underlined that businesses should develop their digital skills further (Habertürk, 2022).

- The NFT exhibition "Move the Capital to Digital with Your Dreams" organized by the Ministry of Culture and Tourism in Ankara was realized in the context of the Capital City Culture Route project. 100 Ankara-themed NFTs were exhibited within the scope of the "Young People Entering the Digital Culture Industry Sector" Project (Culture Route Festival, 2022).
- Isparta Süleyman Demirel University Metaverse Initiative Studio project, which is the first pre-incubation center in Türkiye focused on metaverse, was carried out within the framework of BAKA Financial Support Program for 2022 under the coordination of Süleyman Demirel University, (Göktaş & Hazarhun, 2024). The project team transferred the exhibitions introducing Isparta to the metaverse environment. Visitors were able to experience the metaverse environment through their avatars. In addition, the first Atatürk NFT exhibition in Türkiye and the Türkiye Century NFT exhibition exclusive for the 100th anniversary of our Republic were introduced to visitors.

An examination of academic studies in the context of the reflections of the metaverse on the tourism sector reveals that Bec et al. (2021) focused on virtual reality and augmented reality technology within the framework of virtual tourism applications and found that the tourism sector was successful in the metaverse. Hazan (2010) examined the studies on virtual museums and exhibitions in the virtual world and asserted that digital visitors can both learn about the subject and experience the excitement of a museum in virtual museum and exhibition experiences. Demir (2022) evaluated the reflections of the metaverse on the hotel sector and stated that hotels that can offer alternative solutions to their customers by using digital technology were more popular. The study of Han et al. (2021) showed that it was possible to generate revenue in the tourism industry by utilizing virtual travel services through the metaverse even if outbound travel was forbidden due to the pandemic. Dodd and Johnson (2009) examined the relationship between the real world and the virtual metaverse and investigated whether virtual tourism is a viable alternative to traditional tourism. It has been concluded that users, most of whom are under the age of 18, have adopted virtual worlds, prefer virtual reality tourism to complement traditional tourism, and that there was potential for expansion in this context. The study of Loong (2014) pointed out that gamified tourism activities in virtual worlds generate an economic contribution and stated that the gamification approach is a beacon of hope in determining tourism goals.

Kuş (2021) sought answers to the questions: What is the thematic distribution of comments that contain perceptions of opportunities and concerns about Metaverse? and What is the distribution of user interaction in comments that

contain perceptions of opportunities and concerns about Metaverse? in his study titled "Metaverse: Perceptions of Opportunities and Concerns in the Digital Big Bang". The

thematic distribution of user comments on Metaverse is organized into 16 categories, ranging from the highest number of posts to the lowest number of posts as follow: Trying to Make Sense of Artifacts; Feedback to the Producer; Focus on Real Feelings, Experiences and Problems; Negative Sentiment and Perception of Threats; Reference to Platforms that may be Predecessors of the Metaverse; Emphasis on Economic Opportunities; Emphasis on Access Restrictions; Discussions on Freedom; Perception of a Striking Innovation; Positive Thinking and Perception of Opportunity; Reference to Religion, Morality and Values; Ambivalent Perceptions and Questioning; Views on Abuse and Regulation; Potential for Health Problems; Reference to Technologies that could be Components of the Metaverse; and Ideas on the Conflict of Generations. In addition, it was determined that the themes of Emphasis on Economic Opportunities; Feedback to the Content Producer; Potential for Health Problems; and Focus on Real Feelings, Experiences and Problems received the highest average interaction. Göktaş and Uygur (2024) investigated the metaverse awareness of school administrators and concluded that the level of metaverse awareness of school administrators was at a medium-high level and that there was no significant difference in metaverse awareness according to age, gender, marital status, title, branch, professional seniority, educational status and school type. According to the study of Çakır et al. (2022), the metaverse awareness of students studying in the faculty of sport sciences was at a medium level and the metaverse awareness of women was significantly higher than that of men. According to the study of Avcu et al. (2023), the knowledge, attitude and awareness of high school students regarding metaverse were at a medium level. Participants who were high school students showed a high level of agreement that the metaverse was an investment tool and the future of the internet, while they showed a medium level of agreement that the metaverse had a reliable infrastructure. In the context of the digitalization sub-dimension, it was concluded that the participants were inclined to take part in the metaverse world, do virtual shopping and participate in activities to be organized in the metaverse environment. At the same time, participants think that the metaverse will not have a negative impact on family ties and health and will change their lifestyles. Turan et al., (2023) did not find significant differences in the comparison of metaverse knowledge levels of physical education teachers according to gender and length of service. On the one hand, the metaverse knowledge levels of physical education teachers had significant differences according to marital status, hearing the term metaverse and age. On the other hand, in the social sub-dimension of the metaverse scale, it was determined that single teachers had higher metaverse knowledge levels than married teachers. Physical

education teachers had a higher level of metaverse knowledge in the sub-dimensions of digitalization and lifestyle. Likewise, it was determined that those who had heard the term metaverse had a higher metaverse knowledge level than those who had not in the general metaverse knowledge level. A comparison of the metaverse knowledge levels of physical education teachers according to the age variable indicated that there were no significant differences in the general metaverse knowledge levels between the groups according to social, digitalization and technology sub-dimensions. However, the life style sub-dimension revealed that physical education teachers between the ages of 27-31 had a lower level of metaverse knowledge compared to other age groups. Büyükkarabacak & Balyer (2023) examined the awareness of Metaverse and Metaverse education of school administrators and their views on this issue. The research concluded that school administrators defined the metaverse world as a virtual world and stated that it would be insufficient in the implementation process of educational activities due to the lack of metaverse infrastructure. Therefore, metadata applications are open to improvement to make them widespread in educational activities. Göktaş and Hazarhun (2024) reported in their study that the individuals who participated in Süleyman Demirel University Metaverse Initiative Studio trainings did not have sufficient knowledge about the metaverse before the trainings, that most of the participants preferred the activities carried out in the metaverse environment as a result of the training they received, and that their experiences in the metaverse were remarkable, educational, fun, exciting, calming, interactive and stress-relieving. Hazarhun & Tepeci (2023) investigated the current and future status of using metaverse technology in tourism education from the perspective of tourism academics and revealing its contributions to tourism education. The results of the study revealed that metaverse technology is not utilized in current tourism education. Tourism academics emphasized that the use of metaverse technology in tourism education will increase the quality of the education and that students will benefit from doing their internships in the metaverse universe or hybrid when necessary. Ercan (2022) asserted that metaverse technology will have the most impact on the travel and tourist guidance profession in the tourism sector. In addition, it was emphasized that metaverse technology will provide significant benefits in tourism marketing by providing individuals with prior experience in the tourism sector.

3. Method

The awareness of tourism academics in metaverse technology was examined according to their demographic characteristics in this study. Accordingly, the following hypotheses were developed.

- There is a significant difference in the metaverse outlooks of tourism academics according to the gender variable.
- There is a significant difference in the metaverse outlooks of tourism academics according to the income variable.
- There is a significant difference in the metaverse outlooks of tourism academics according to the marital status variable.
- There is a significant difference in the metaverse outlooks of tourism academics according to the age variable.
- There is a significant difference in the metaverse outlooks of tourism academicians according to the Faculty Departments

The approval of Süleyman Demirel University Social and Human Ethics Committee dated 19.09.2023 and number 140 / 45 attesting that the research was ethically correct was obtained before starting the research. The population of the research consisted of 2125 tourism academics registered on Yökekademik website on 25.09.2023 (Yökekademik, 2024). The data of the study were collected by the questionnaire technique, one of the quantitative research methods. A questionnaire form was sent to the corporate e-mail addresses of 2125 tourism academics between 25.09.2023 and 25.03.2024 and 402 questionnaires were returned. Krejcie and Morgan (1970) proposed a general table on sample size required to represent the size of a population in a study. If the population size is 2200 in the given table at a significance level of 0.05 and an error rate of ± 0.05 , the sample size is stated as 327 people. In line with this information, it is possible to say that the sample number of the study is sufficient. The data collection questionnaire of the study is comprised of two parts. The first part includes the metaverse scale and the second part includes demographic information about the tourism academicians. The metaverse scale consists of 15 statements developed by Süleymanoğulları et al. (2022) and four dimensions in total. These dimensions are specified as technology, digitalization, social and lifestyle. A 5-point Likert-type scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) was used in the study. A pilot test was carried out with 50 tourism academicians. No item with a low load or loaded with more than one factor was removed from the scale during the pilot test and data analysis process. The data obtained from tourism academics were analyzed in a package program developed for social sciences. An explanatory factor analysis was conducted in the study to ensure the construct validity of the Metaverse scale and Cronbach's Alpha coefficients were calculated to test the internal consistency of the scale. In addition, skewness and kurtosis values were examined to test the normality of the data distribution. It was concluded that the data distribution was normal and statistical analyzes of parametric tests were used. A T-test and one-way analysis of variance (ANOVA) test were used to compare the scores obtained from the

Table 1. Distribution of Participants According to Demographic Characteristics

Variables	Groups	Number (f)	Percent (%)
Gender	Male	215	53.5
	Female	187	46.5
Civil status	Married	284	70.6
	Single	118	29.4
Age	25-34	114	28.4
	35-44	179	44.5
	45-54	85	21.1
	55 and over	24	6.0
Department	Tourism Management (Tourism and Hotel Management - Accommodation Management etc.)	201	50.0
	Gastronomy and Culinary Arts (Cookery, Pastry, etc.)	96	23.9
	Tourism Guidance (Travel Management etc.)	80	19.9
	Recreation Management	25	6.2
Revenue	10.001-40.000 TL	44	10.9
	40.001-100.000 TL	291	72.4
	100.001 and over	66	16.4
	Invalid	1	0.2
	Total	402	100.0

Source: Elaborated by Authors

metaverse scale according to the demographic characteristics of tourism academicians.

4. Findings

53.5% of the tourism academics participating in the research were men while 70.6% of the participants stated that they were married. In addition, 44.5% of the participants were in the 35-44 age group while 50% of the participants stated that they worked in the Tourism Management (Tourism and Hotel Management - Accommodation Management, etc.) department of the faculties. Finally, 72.4% of the participants claimed a monthly income between 40,001-100,000 TL.

Validity and Reliability

The overall reliability of the metaverse awareness scale in Table 2 was calculated as $\alpha=0.86$. The reliability of the first factor was $\alpha=0.88$, the second factor $\alpha=0.85$, the third factor $\alpha=0.75$ and the last factor $\alpha=0.60$. The KMO test in the explanatory factor analysis table of the variables in Table 2 is 88.9% (.889). Since $88.9>0.50$, our data set is suitable for factor analysis. The result of Bartlett's test of sphericity was significant ($\chi^2(105)=2925.294$; $p<.000$) and it was determined that there was a high correlation between the variables and data distribution was normal.

Table 2. Metaverse Awareness Explanatory Factor Analysis

Factors	Factor load	Eigenvalue	Explained Variance%	Cr. Alpha	Ave. (μ 1-5)	SS ($\pm$)	F	p
Metaverse awareness			67,876	0,86	3,52	($\pm$)1,08	93,676	0,000
Factor 1: Technology		6,134	40,897	0,88	3,84	($\pm$)1,01	91,910	0,000
The Metaverse will accelerate the transition from the physical world to the virtual world.	,840							
A virtual living environment is being constructed through the Metaverse.	,793							
The Metaverse will change our living standards and routines.	,780							
The Metaverse is the future of the internet.	,691							
The Metaverse will affect people's level of virtual communication and interaction.	,670							
Metaverse is the most important product of emerging technology.	,551							
Factor 2: Social Environment		1,836	12,240	0,85	3,13	($\pm$)1,15	70,891	0,000
I do virtual shopping in the Metaverse.	,831							
I participate in events (concerts, sportive activities, trips, meetings, etc.) organized in the Metaverse world	,814							
I participate in the metaverse world by designing my own avatar.	,793							
The Metaverse contains innovations that will make our lives easier.	,658							
The Metaverse has a reliable infrastructure.	,529							
Factor 3: Lifestyle		1,163	7,752	0,75	3,44	($\pm$)1,15	2,924	0,033
The Metaverse will have a negative impact on family ties.	,879							
The Metaverse will have a negative impact on my health (sleep, nutrition, active life, depression, etc.).	,873							
Factor 4: Digitalization		1,048	6,988	0,60	3,59	($\pm$)1,04	176,081	0,000
The Metaverse is a product of marketing strategy.	,824							
The Metaverse is an investment tool.	,668							

Notes: Principal Component Factor Analysis with Varimax Rotation Kaiser-Meyer-Olkin Sampling Adequacy=.889.

Bartlett's Test of Sphericity: $p<.000$ (Chi-Square 2925,294 df=105).

Source: Elaborated by Authors

Table 3. Skewness and Kurtosis Coefficients for Variables

	Technology	Social Environment	Lifestyle	Digitalization
N	402	402	402	402
Skewness	-,922	-,346	-,277	-,262
Standard error (Skewness)	,122	,122	,122	,122
Kurtosis	,666	-,372	-,373	-,262
Standard error (Kurtosis)	,243	,243	,243	,243

Source: Elaborated by Authors

The 4 factors with eigenvalue statistics greater than 1 in Table 2 were identified for metaverse awareness. The first factor explains 40.897% of the total variance, the second factor explains 12.240%, and the four factors explain 67.876% of the total variance. The first factor is named "Technology", the second factor is named "Social Environment", the third factor is named "Lifestyle" and the fourth factor is named "Digitalization".

The results of the analysis of whether the data are normally distributed are presented in Table 3. According to Kline (2011), skewness and kurtosis coefficients between ± 1.5 indicate that the data are distributed normally. The results of the analysis indicate that the coefficients are between ± 1.5 . Accordingly, it can be said that the data of all variables manifest normal distribution.

5. Hypothesis Testing

T Test

The T-test is used to investigate whether there is a difference in means between two sample groups. The T-test determines whether the mean in one group is significantly different from the mean in the other group (Kalaycı, 2008).

Table 4 shows whether there is a difference in the dimensions of metaverse awareness according to gender. The results obtained from the analysis of the data indicate that there is a difference between the technology dimension and gender at a significance level of ($p > .05$). Female participants ($x = 4.02$) perceive the metaverse as a more

important tool of technology than Male participants ($x = 3.68$). A difference between the social environment dimension and gender at a significance level of ($p > .05$) is determined again in Table 4. Female participants ($x = 3.24$) perceive the metaverse as a social environment more than Male participants ($x = 3.04$). No significant difference at the ($p < .05$) significance level was observed between the other dimensions of metaverse awareness, namely lifestyle and digitalization, and gender. Again in Table 4, no significant difference was detected at the ($p < .05$) significance level in the results of the analysis of whether there are differences in the dimensions of metaverse awareness according to marital status.

One-Way Variance Analysis

One-way variance analysis is a statistical technique used to test whether the difference between the averages is significant at a certain confidence level (such as 95%, 99%) by comparing the averages of two or more groups related to a single independent variable according to a dependent variable (Ural & Kılıç, 2005). The prerequisite for one-way variance analysis is that group variances are homogeneous (Kalaycı, 2008). The results of Levene's test of technology perception according to age in metaverse awareness shown in Table 5 indicate that group variances were homogeneous ($p > 0.05$) (0.765). However, the F value of the dependent variable of technology perception was 1,145 and the p value was $0,331 > 0,05$. Accordingly, no significant difference was determined between age groups and the technology dimension.

Table 4. T Test Results for Factor Dimensions

Factors	Variables	Number (N)	A.O.	S.S.	t-Value	p-Value
Technology	Male	215	3,68	,884	-4,254	,000
	Female	187	4,02	,673		
Social Environment	Male	215	3,04	1,011	-2,120	,035
	Female	187	3,24	,825		
Lifestyle	Male	215	3,47	,999	,627	,531
	Female	187	3,41	1,065		
Digitalization	Male	215	3,57	,890	-,395	,693
	Female	187	3,61	,783		
Technology	Married	284	3,81	,834	-1,305	,193
	Single	118	3,92	,745		
Social Environment	Married	284	3,09	,942	-1,423	,155
	Single	118	3,23	,905		
Lifestyle	Married	284	3,42	1,007	-,586	,558
	Single	118	3,49	1,085		
Digitalization	Married	284	3,59	,856	,150	,881
	Single	118	3,58	,806		

Source: Elaborated by Authors

Table 6. One-Way Variance Analysis Results According to The Faculty Departments Variable (N=402)

Factor dimensions		Mean of Squares	Degree of Freedom	Means Square	F	Sig.
Technology	Between groups	0,902	3	0,301	0,456	0,713
	In-group	262,449	398	0,659		
	Total	263,350	401			
Social Environment	Between groups	0,124	3	0,041	0,047	0,986
	In-group	349,286	398	0,878		
	Total	349,410	401			
Lifestyle	Between groups	1,778	3	0,593	0,557	0,644
	In-group	423,426	398	1,064		
	Total	425,205	401			
Digitalization	Between groups	4,699	3	1,566	2,233	0,084
	In-group	279,209	398	0,702		
	Total	283,908	401			

*p<0,05

Source: Elaborated by Authors

The Levene's test results of the perception of social environment in metaverse awareness according to age given in Table 5 indicate that group variances were homogeneous ($p>0.05$) (0.463). However, the F value of the dependent variable of social environment perception was 1,316 and the p value was 0,269 >0.05 . As such, no significant difference was determined between age groups and the social environment dimension.

The Levene's test results of lifestyle perception in metaverse awareness according to age indicated that group variances were homogeneous ($p>0.05$) (0.223). However, the F value of the dependent variable of lifestyle perception was 0.337 and the p value was 0.799 >0.05 . Thus, no significant difference was determined between age groups and the lifestyle dimension.

Finally, the Levene's test results of the perception of digitalization in metaverse awareness according to age in Table 5 indicate that group variances were homogeneous ($p>0.05$) (0.560). However, the F value of the dependent variable of digitalization perception was 1,381 and the p value was 0,248 >0.05 . Therefore, no significant difference was determined between age groups and the digitalization dimension.

The Levene's test results of technology perception in metaverse awareness according to faculty departments in Table 6 indicate that group variances were homogeneous ($p>0.05$) (0.278). However, the F value of the dependent

variable of technology perception was 0.456 and the p value was 0.713 >0.05 . Therefore, no significant difference was determined between faculty departments and the technology dimension.

Group variances were homogeneous according to the Levene's test results of the perception of social environment according to faculty departments in metaverse awareness indicated in Table 6 ($p>0.05$) (0.678). However, the F value of the dependent variable of social environment perception was 0.047 and the p value was 0.986 >0.05 . Accordingly, no significant difference was determined between faculty departments and the social environment dimension.

Group variances were homogeneous according to the Levene's test results of lifestyle perception of faculty departments in metaverse awareness indicated in Table 6 ($p>0.05$) (0.053). However, the F value of the dependent variable of lifestyle perception was 0.557 and the p value was 0.644 >0.05 . Accordingly, no significant difference was determined between faculty departments and the life style dimension.

Finally, the Levene's test results of the perception of digitalization in metaverse awareness according to faculty departments shown in Table 6 indicate that group variances were homogeneous ($p>0.05$) (0.785). However, the F value of the dependent variable of digitalization perception was 2,233 and the p value was 0,084 >0.05 . Accordingly, no

Table 7. One-Way Variance Analysis Results According to Income Groups (N=402)

Factor dimensions		Mean of Squares	Degree of Freedom	Means Square	F	Sig.
Technology	Between Groups	0,355	3	0,178	0,269	0,764
	In-group	262,971	398	0,661		
	Total	263,326	401			
Social Environment	Between Groups	2,346	3	1,173	1,345	0,262
	In-group	347,060	398	0,872		
	Total	349,406	401			
Lifestyle	Between Groups	1,778	3	0,593	4,590	0,011
	In-group	423,426	398	1,064		
	Total	425,205	401			
Digitization	Between Groups	0,609	3	0,305	0,428	0,652
	In-group	283,290	398	0,712		
	Total	283,899	401			

*p<0,05

Source: Elaborated by Authors

Table 8. Post Hoc Test Results According to Income Groups (N=402)

Lifestyle	Income groups	n	Average	Average Difference (I-J)	p-value
10.001-40.000 TL	40.001-100.000	291	3,53	-,44861*	,019
(n=44) (x=3,09)	100.001and over	66	3,29	-,20455	,559
40.001-100.000	10.001-40.000	44	3,09	,44861*	,019
TL(n=291) (x=3,53)	100.001 and over	66	3,29	,24406	,187
100.001TL and	10.001-40.000	44	3,09	,20455	,559
over(n=66) (x=3,29)	40.001-100.000	291	3,53	-,24406	,187

Source: Elaborated by Authors

significant difference was determined between faculty departments and the digitalization dimension.

The Levene's test results of technology perception according to income groups in metaverse awareness shown in Table 7 indicate that group variances were homogeneous ($p>0.05$) (0.647). However, the F value of the dependent variable of technology perception was 0.269 and the p value was $0.764>0.05$. Accordingly, no significant difference was determined between income groups and the technology dimension.

The Levene's test results of the perception of social environment according to income groups in metaverse awareness shown in Table 7 indicate that group variances were homogeneous ($p>0.05$) (0.833). However, the F value of the dependent variable of social environment perception was 1,345 and the p value was $0,262>0,05$. Accordingly, no significant difference was determined between income groups and the social environment dimension.

The Levene test results of lifestyle perception according to income groups in metaverse awareness indicated in Table 7 show that group variances were homogeneous ($p>0.05$) (0.510). The F value of the dependent variable of lifestyle perception was determined to be 4,590 and the p value was $0,011<0,05$. Accordingly, a significant difference was determined between income groups and the lifestyle dimension.

According to the results of the Tukey HSD Post-Hoc test in Table 8, there is a significant difference between the lifestyle dependent variable and the 10,001-40,000 TL and 40,001-100,000 income groups ($p<0.05$). Accordingly, it was determined that the 40.001-100.000 TL income group ($x=3,53$) perceived metaverse as a lifestyle tendency more than the 10.001-40.000 TL income group ($x=3,09$). This indicates that metaverse technology will become a part of the lives of tourism academics more in parallel with the increase in income.

Group variances were found to be homogeneous according to the Levene test results of the perception of digitalization in metaverse awareness according to income groups in Table 7 ($p>0.05$) (0.081). However, the F value of the dependent variable of digitalization perception was 0.428 and the p value was $0.652>0.05$. Accordingly, no significant difference was found between income groups and the digitalization dimension.

6. Conclusion and Discussion

The recent development of the Internet of Things, virtual universe, augmented reality, mobile communication and metaverse technologies has had a significant impact on the education sector (Göktaş & Uygur, 2024). In particular, unlike the limitations of 2D-based online and distance learning used in the field of education (Mystakidis, 2022), metaverse technology offers the opportunity to experience the virtual universe through 3D graphics, thus combining theory and practical applications in education and increasing the active participation of students in the lessons (Göçen, 2022). As such, utilizing metaverse technology in the process of delivering theory as well as practical training to students in tourism education, where internship practices are intensive, can increase the quality of tourism education (Hazarhun & Tepeci, 2023). Tourism academics should also have awareness about metaverse technology to integrate this technology in tourism education and utilize it in the learning process. Therefore, the aim of this study was to determine the metaverse awareness of tourism academics working in public and private universities affiliated to the Council of Higher Education (YÖK). An analysis of the data obtained for this purpose revealed that technology and social environment, which are the dimensions of metaverse awareness of tourism academics, differed according to gender. Accordingly, female tourism academics perceived the metaverse as both an important tool of technology and social environment more than male tourism academics. The findings of a study carried out by Çakır et al. (2022) that female students have a significantly higher awareness of the Metaverse than male students parallel these findings. Likewise, the study of Suh and Seongjin (2022) involving primary school students revealed that female students used the metaverse environment more. On the other hand, it was determined that lifestyle and digitalization, which are other dimensions of metaverse awareness, did not differ according to the gender of tourism academics. Studies with different results from the findings of this study were also encountered when other studies in the literature were examined. For example, the sample of university students used in the study conducted by Özdemir et al.(2022) revealed that the metaverse awareness levels of male students were higher than female students in the digitalization and lifestyle sub-dimensions of metaverse awareness. Likewise, Aburbeian et al. (2022) emphasized that males were more interested in metaverse technology than females. Turan et al. (2023) conducted a study with physical education teachers and Göktaş and Uygur (2024) conducted a study with school

administrators and found that the level of metaverse knowledge did not differ according to gender in all sub-dimensions.

It was revealed that tourism academics did not differ in all sub-dimensions of metaverse awareness according to their marital status. While this finding is consistent with the research of Göktaş and Uygur (2024), it differs from the findings of Turan et al. (2023) concluded that the metaverse knowledge levels of physical education teachers differed according to marital status in the social sub-dimension of metaverse knowledge levels and that single teachers had higher knowledge levels than married teachers. Another finding of the study is that the metaverse awareness of tourism academics did not change according to age in all dimensions. This finding supports the results of Göktaş and Uygur (2024). This result can be interpreted to mean that the concept of metaverse has reached a certain level of awareness among tourism academics regardless of their age and is accepted in the society. On the other hand, unlike the finding of the study, Turan et al. (2023) emphasized in their study that participants between the ages of 27-31 had a lower level of metaverse awareness compared to other age groups in the lifestyle sub-dimension. Finally, it was concluded that the metaverse awareness of tourism academics did not vary according to the faculty departments of the academics in all sub-dimensions, however, the lifestyle dimension differed with the income of tourism academics. A significant difference was observed between tourism academics in the 10,001-40,000 TL and 40,001-100,000 TL income groups. This means that it can be assumed that with the increase in the income of tourism academics, their awareness of metaverse technology will increase and included in their lives more. An examination of the literature indicates that Çakır et al. (2022) found no significant difference between the metaverse awareness of students according to their departments in their study and Göktaş and Uygur (2024) found no significant difference between the metaverse awareness of school administrators according to school type in their study. It can be said that this finding of the research is supported by the literature.

Theoretical Implications

An examination of the literature revealed that the studies on metaverse in tourism education were limited (Lee & Jo, 2023, Ercan, 2022; Serçek & Korkmaz, 2023) and no study was found in Türkiye that revealed the awareness of tourism academics working in public and private universities according to demographic variables (age, gender, income, marital status, department). In this context, the research can be considered unique because it reflects the metaverse awareness of tourism academicians who deliver tourism education. On the other hand, metaverse technology can deliver major learning outcomes by increasing the quality of tourism education in both public and private universities and improving learning processes by providing students with hands-on experiences in 3D

virtual environments (Hazarhun & Tepeci, 2023). Furthermore, educators are expected to have a high level of metaverse awareness to renew their instruction processes to correspond with the requirements of current developing technology practices (Göktaş & Uygur, 2024). As such, addressing the issue in the research will contribute to the literature since it is current and on the agenda. On the other hand, this study also examined whether there was a significant difference between metaverse awareness and the income variable unlike other studies in the literature (Göktaş & Uygur, 2024; Turan et al., 2023; Çakır et al., 2022). It has been concluded that the lifestyle dimension of metaverse awareness differs with the income of tourism academics, and based on this result, it is thought that significant contributions will be made to the expansion of the current literature by pointing to the inferences that increases in the income of individuals will increase their knowledge and awareness of metaverse technologies. According to the diffusion of innovation theory in the literature, for individuals or institutions to adopt or reject any innovation, they must first become aware of the innovation by acquiring information about it. In other words, individuals try to gather information about an idea, practice, or object they perceive as innovative, and if they perceive this innovation as advantageous, they convince themselves to adopt it (Rogers, 1995). In this context, during the diffusion process of a digital technological innovation like the metaverse, tourism academics must first become aware by obtaining information, and then convince themselves to use metaverse technology by identifying its advantages for tourism education. Similarly, another model in the literature developed to explain the process of adapting to technological advancements is the Technology Acceptance Model, developed by Fred D. Davis (Venkatesh & Davis, 2000). According to this model, factors such as perceived usefulness and perceived ease of use influence whether tourism academics adopt metaverse technology as an innovation (Garip & Köker, 2023). In this regard, the literature emphasizes that metaverse technology offers various benefits and opportunities to users (Lee et al., 2011; Squires, 2021). In this context, increases in tourism academics' income levels could enhance their knowledge and awareness of metaverse technologies. This is because tourism academics with higher incomes may allocate more financial resources to purchasing books or conducting research related to metaverse technology. On the other hand, they may adopt the use of this technology by becoming aware of it and perceiving that it enables innovative applications in tourism education. Garip & Köker (2023) emphasized that metaverse technology would encourage the renewal of educational processes. Similarly, a study by Maharg and Owen (2007) revealed that the use of metaverse in legal education, through the creation of simulations, would reshape learning processes. Based on all this information, the significant variation in tourism academics' metaverse awareness according to income levels can be explained through the diffusion of

innovation theory and the technology acceptance model, highlighting the theoretical contributions of this study.

Practical Implications

The Council of Higher Education (YÖK) initiated the "YÖK is Digitalizing" project and started working to establish the infrastructure of digital technologies in universities to accelerate the digital transformation in higher education in Türkiye (Akbaba & Mühürdaroğlu, 2022). As such, the Council of Higher Education should determine a road map in terms of the applicability of Metaverse in education in universities. This study can provide guidance to the Council of Higher Education in determining new strategic goals for the use of metaverse technology in education by revealing the metaverse awareness of tourism academics teaching at public and private universities according to demographic variables. In particular, as a result of the findings that male tourism academics have lower metaverse awareness in technology and social environment dimensions compared to female tourism academics, university boards of directors and the Council of Higher Education (YÖK) can increase their level of knowledge about metaverse technology by organizing metaverse awareness training programs for male tourism academics. Attention should be paid to make participation in these metaverse training programs compulsory. In the study, the conclusion that the 40,001-100,000 TL income group ($x=3.53$) perceived metaverse as a lifestyle trend more than the 10,001-40,000 TL income group ($x=3.09$) and the interpretation that metaverse technology will become more common by tourism academics with the increase in income can incentivize lawmakers to improve the current salaries of tourism academics. Lawmakers may increase the current salaries of tourism academics to ensure their academic development. On the other hand, the Council of Higher Education (YÖK) can increase the income levels of tourism academics by improving academic incentive allowances and conditions of tourism academics. In this case, tourism academics with increased income can participate in various special trainings to learn about the use and learning processes of other technologies, especially metaverse. Thus, the metaverse awareness and knowledge levels of tourism academics can be increased. In addition to increasing the metaverse awareness of tourism academics to expand the use of metaverse technology in tourism education, free metaverse trainings should be provided for students studying tourism by YÖK as well as the education centers of universities. Finally, it was revealed that the metaverse technology infrastructure in tourism education is inadequate (Hazarhun & Tepeci, 2023). Therefore, YÖK, government agencies and private technology companies should work in cooperation and provide resource transfer to accelerate the infrastructure studies of metaverse technology to enable the widespread use of metaverse technology in tourism education.

Limitations and Suggestions for Future Research

This study has several limitations. Since this study only examines the metaverse awareness of tourism academics working in private and public universities in Türkiye with unique social roles and characteristics according to their demographic variables (income, age, gender, marital status), it is not possible to generalize the results to tourism academics around the world. The expectations that societies attribute to men and women within their cultures change and shape their behaviors. Likewise, the salaries earned by tourism academics vary according to their countries of employment. Therefore, it is highly recommended that the study is repeated with tourism academics in other countries to enable comparisons between different cultures. Furthermore, since metaverse technology is developing rapidly, determining the level of metaverse knowledge of other academics teaching in different disciplines in universities and its use without limiting the scope to academics teaching tourism can be recommended. Another limitation of the study was that the number of tourism academics registered in the Yök academic system is constantly increasing, which makes it difficult to keep the study up-to-date. This research was conducted on 25.09.2023 based on the tourism academics registered in the Yök academic site, but the number of tourism academics entering the Yök academic system is increasing daily. Research on metaverse awareness with different variables can be conducted in future studies by taking the current list of the Yök academic system into account. In addition, qualitative and quantitative research can be carried out to reveal the level of metaverse awareness and knowledge of students studying tourism.

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Investigating the Metaverse Awareness of Tourism Academics

Abstract

Metaverse has become a concept that has gained importance in the field of education and its use has become widespread. This technology is expected to guide rapid developments in the tourism education process of universities. In the light of all these expectations, it is important to reveal the awareness of tourism academics regarding the concept of metaverse and carry out academic studies on this concept to deliver qualified tourism education. The aim of this study is to determine the metaverse awareness of tourism academics working in public and private universities affiliated with the Council of Higher Education (YÖK). The data of the study were collected by using the 5-point Likert type Metaverse Scale developed by Süleymanoğlu et al. (2022) with one of the quantitative research methods, namely the survey application technique. The sample of the research consists of academics (n=402) registered in the YÖK academic system. Descriptive statistics and explanatory factor analysis of the scale were carried out to determine the demographic variables of tourism academics. Subsequently a t-test and one-way analysis of variance were conducted in line with the hypotheses formed in line with the purpose of the study. The results of the study revealed that there was a difference between the technology and social environment dimension and gender at a significance level of ($p>.05$). No significant difference was found between the other dimensions of metaverse awareness, namely lifestyle and digitalization, and gender at the ($p<.05$) significance level. No significant difference was found at the significance level in the results of the analysis of differences in the dimensions of metaverse awareness according to marital status, age groups and

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Full Name	Author contribution roles	Contribution rate
Pınar Göktepe:	Conceptualism, Methodology, Software, Validation, Formal Analysis, Resources, Data Curation, Writing - Original Draft, Writing - Review & Editing, Visualization, Supervision	35%
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