



Examination of metaverse awareness levels of university students who have sports education

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Abstract

Being a thinking creature, human has made progress in almost every subject that his mind has reached. The word technology has also emerged as a result of this development. With the advancement of technology in today's digital age, systems that transmit human behaviors to the digital world have also developed rapidly. Metaverse is a good example that can be given to these systems and concepts lately. This technology, in which human movements are at the center, provides benefits in many different fields such as medicine, games, sports and art. In this context, it is important to include the Metaverse, a new technological phenomenon that will contribute to the development and technological progress of sports, in the field of sports, and to introduce and train all individuals in the sports community to the Metaverse. In this study, it was conducted to investigate the Metaverse knowledge, attitude and awareness level of the students studying at the Faculty of Sports Sciences in order to reveal the state of Metaverse knowledge and awareness of the students studying at the Faculty of Sports Sciences, which provides human resources to the field of sports, and to draw attention to the awareness of Metaverse technology. The sample of the study consists of 238 students studying at Sivas Cumhuriyet University, Faculty of Sport Sciences. As a result of our study, while a significant difference was found in various sub-dimensions according to the gender, income level and possession of crypto money, no significant difference was found according to the departments of the students. Conferences can be organised for students to have more information about the metaverse and to raise their awareness.

Keywords: Sports, technology, sports technology, metaverse.

Spor Eğitimi Alan Üniversite Öğrencilerinin Metaverse Farkındalık Düzeylerinin İncelenmesi

Özet

Düşünebilen bir canlı olan insan, aklının eriştiği hemen her konuda gelişme gerçekleştirmiştir. Teknoloji sözcüğünde da bu gelişmenin bir neticesi olarak ortaya çıkmıştır. Günümüz dijital çağımızda teknolojinin ilerlemesiyle birlikte insan davranışlarını dijital dünyaya ileten sistemler de hızla gelişim göstermiştir. Metaverse de son zamanlarda bu sistemlere ve kavramlara verilebilecek güzel bir örneği teşkil etmektedir. İnsan hareketlerin merkezde olduğu bu teknolojiden tıp, oyun, spor, sanat gibi birçok farklı alanda yarar sağlanılmaktadır. Bu bağlamda sporun geliştirilmesi ve teknolojik olarak ilerlemesine bir katkı sunacak yeni teknolojik olgu olan Metaverse spor alanına katmak ve spor camiası içindeki tüm bireylere Metaverse tanıtmak ve eğitim vermek önem arz etmektedir. Bu çalışmada spor alanına insan kaynağı sağlayan Spor Bilimleri Fakültesinde okuyan öğrencilerin Metaverse bilgisi ve farkındalığının ne durumda olduğunu ortaya koymak ve Metaverse teknolojisinin farkındalığına dikkat çekmek için spor bilimleri Fakültesi'nde öğrenim gören öğrencilerin Metaverse bilgi, tutum ve farkındalık düzeyini araştırmak amacıyla yapılmıştır. Çalışmanın örneklemini Sivas Cumhuriyet Üniversitesi Spor Bilimleri Fakültesi'nde öğrenim gören toplam 238 öğrenci oluşturmaktadır. Çalışmamızın sonucunda öğrencilerin cinsiyet, gelir düzeyleri ve kripto para sahip olma durumuna göre çeşitli alt boyutlarda anlamlı farklılık tespit edilirken, öğrencilerin bölümlerine göre herhangi bir anlamlı farklılık bulunamamıştır. Öğrencilerin metaverse hakkında daha fazla bilgi sahibi olmaları ve farkındalıklarının artırılması için konferanslar düzenlenebilir.

Anahtar Kelimeler: Spor, teknoloji, spor teknoloji, metaverse.

INTRODUCTION

Being a thinking creature, man has made progress in almost every subject his mind can reach. The word technology also emerged as a result of this development. Over time, the rapid spread of technologies in daily life has enabled many new concepts to be included in our lives (9). In today's digital age, with the advancement of technology, systems that transmit human behavior to the digital world have also developed rapidly. Metaverse has recently been a good example of these systems and concepts. This technology, which focuses on human behavior, provides benefits in many different fields such as games, medicine, sports and arts (18). The Metaverse, first described in author Neal Stephenson's 1992 novel "Snow Crash", has become a concept used to describe 3D (three-dimensional) VWs (virtual worlds) in which people interact with each other and their environment without being physically together (4). It is also defined as a world where economic, social and cultural activities that create value in the developing world take place (27). This concept, which provides realistic and precise images through the expansion of smartphones and internet networks and allows the real world to be moved to the virtual world by recreating the feeling of the real world (21), points to a world where the physical world and the digital world come together and also regardless of physical location, through their digital symbol avatars, people can gather in an environment and play games, socialize, work, watch sports events, shop and try on clothes, do sports, go to concerts, in short, continue their daily lives and spend their free time (33). In the Metaverse world, people can socialize, buy real estate, travel, do sports, design, and even realize all kinds of fiction, including university education (24).

Mark Zuckerberg, the founder of Facebook, stated that Facebook's vision will revolve around the project of building an extremely ambitious "Metaverse" and that its icons will turn into infinity signs, shifting everyone's attention to the Metaverse. As the concept of Metaverse partially takes place in our daily lives, it has become a subject that is discussed and studied, and this concept has become more interested and also questioned (10). Additionally, Mark Zuckerberg commented, "Our hope is that within the next decade, the Metaverse will reach billions of people, host hundreds of billions of dollars of digital commerce, and support the work of millions of creators and developers" (14). After Facebook, the concept of Metaverse began to take a strong, if not intense, place in many areas of our lives, from education to commerce, from sports to art, and continues to expand its area of influence every day (19). Recently, with the development of smartphones and VR devices, interaction between many different real and virtual objects has become possible and a new Metaverse world has begun to spread rapidly (21). The timeline of Metaverse development, which includes many key events from the emergence of the Internet and its first mention in the literature, to the first virtual world project with Second Life and the latest Metaverse projects of large technology companies such as Facebook and Microsoft, is given below.

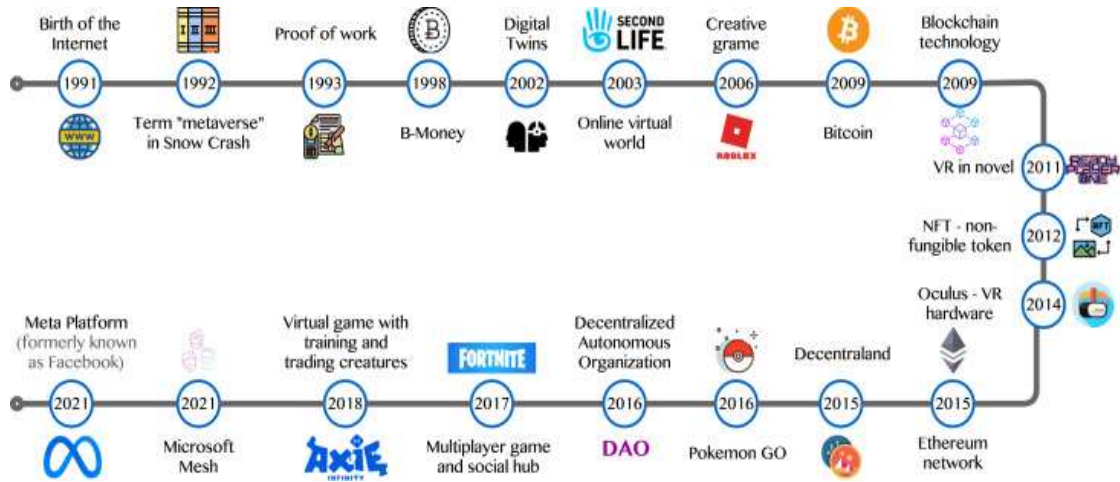


Figure 1: Metaverse progression timeline including key events from 1991 to 2021 (17).

Developments in the technological field show a strong interaction with sports as well as with every other field. While sports inspires many technological developments, it also benefits from developed technologies in many cases (33). In our daily lives, the reflections of technology attract attention at almost every point, from media equipment that provides access to sports to active and passive practitioners and audiences, statistics, analysis and artificial intelligence applications, training techniques and sports equipment (1). The concept of Metaverse, which emerged as a new technological development, has also been integrated into sports and has begun to take its place in sports fields. Metaverse has introduced many concepts within the sports phenomenon to the literature with the technological innovations it has brought. One of these is defined by Süleymanoğulları et al. (29) as "MetaSport" as a virtual universe in which the Metaverse infrastructure is created with the effect of technology and digitalization in order to achieve competitive competition, superiority, entertainment or perfection within the framework of certain rules in the field of sports.

From another perspective, it would not be wrong to use the concept of 'Metaversport' as the transfer of all kinds of physical conditions (Training, Sports management, sports organizations, competitions, etc.) within the phenomenon of sports to the virtual environment of the Metaverse created by technological developments.

Today, with digitalization gaining momentum, augmented reality training, which has been used by major sports clubs for a long time, has begun to become widespread around the world. After observing the benefits of these trainings, even clubs competing in national leagues have started to make their investments in this direction. These clubs also use technological equipment such as wearable technologies and simulations in their training. According to studies, fully immersive virtual reality training positively affects the motor performance and skill development of athletes. Even though sports clubs exist in different places and times offered by the Metaverse world, they have the opportunity to interact in the same virtual environment and evaluate technical and tactical training thanks to avatars. Providing young athletes with the opportunity in the Metaverse world to try movements, which need to be tried a lot and involve risks that may affect their development, thousands of times without any physical harm, creates a great opportunity for athletes (35).

Additionally, it may be possible to solve the difficult problems posed by online learning in sports science faculties by incorporating the Metaverse into physical education subjects. Virtual reality technology is a virtual reality system that allows sports activities, such as playing screen golf in the classroom, to be performed while watching a screen. In a situation where sports activities cannot be performed due to restrictions on outdoor activities, most students can enjoy sports activities in virtual reality as if they were playing football or baseball, and also allow users to experience the effects of real exercise in an augmented reality system in a virtual universe. As explained above, sports such as on-screen golf, baseball, tennis, badminton, table tennis, horseback riding and yoga etc. can be taught just like in the real physical education practice, thanks to Metaverse (34)

The most important feature of sports is that it is an area where "cultural dissemination" is the fastest and most effective (6). In this context, these opportunities are great chances not only for athletes and students, but also for sports spectators. With Metaverse, sports fans have the opportunity to go to Premier League matches without any hassle, for example, from their home or workplace in Turkey, and to watch any match from any angle they want with their friends living in another country. With the socialization effect of sports, people in the metaspports world interact with international people and even offer the opportunity to make new friends from other countries. For example, the Milan-Fiorentina match in Serie A, one of Europe's important and major leagues, was broadcast live on the Metaverse within the Nemesis business. This excitement was experienced for the first time by users connecting from Southeast Asia and North Africa (31). In another example of the Metaverse in action for those who also want to practice the sport rather than watch it, a National Geographic VR subscription allows individuals to virtually ski among icebergs using Oculus VR hardware (15).

Governments must catch up with the rapid development of new technologies (30). We can say that these technological developments should then be included in areas such as education, training, health, economy, trism, and sports, etc., and thus support progress in these areas. Technological developments significantly increase their impact in sports fields as well as in different fields. As progress is made in Metaverse technology, the sports ecosystem will also reap the benefits. In addition, it is thought that with Metaverse, there will be a transformation in almost every field and 'value' functions of companies in the future, from entertainment services to sports services, from healthcare services to consumer products and even payments. In addition, new markets, resources and industries, as well as new types of skills, certifications and professions, will emerge in the future (16,13). In this context, it is important to add Metaverse, a new technological phenomenon that will contribute to the development and technological progress of sports, to the sports field and to introduce it to all individuals within the sports community and provide them with training. When the literature is examined, it is seen that most of the studies on Metaverse are compilation studies. It is thought that quantitative studies should be carried out and this deficiency should be eliminated. This study was conducted to reveal the level of Metaverse knowledge and awareness of students studying at the Faculty of Sports Sciences, which provides human resources to the field of sports, and to investigate the level of Metaverse knowledge, attitude and awareness of students studying at the Faculty of Sports Sciences in order to draw attention to the awareness of Metaverse technology.

METHOD

Research model

This study is descriptive in nature, one of the quantitative research approaches. Descriptive research is conducted to describe the current situation without making any intervention (12). In this study, which was carried out to determine the Metaverse knowledge, attitude and awareness level of students studying at the Faculty of Sports Sciences, the relational screening model, one of the research methods, was used. The relational screening model is a research method that provides the opportunity to see the existence and degree of change between two or more variables (20). With this model, while researching the current situations, the things and events that are the subject of the research are examined and defined under certain conditions (7,20).

Research group

The sample of the study consists of 126 (52.9%) female students and 112 (47.1%) male students studying at Sivas Cumhuriyet University Faculty of Sports Sciences in the academic year 2022-23. The distribution of participants according to departments consists of Physical Education Teaching 65 (27.3%), Coaching Education 61 (25.6%), and Sports Management department 112 (47.1%). According to the grade variable, the distribution is as follows: 1st Grade 44 (18.5%), 2nd Grade 55 (23.1%), 3rd Grade 59 (24.8%) and 4th Grade 80 (33.6%). See Table 1. Convenient sampling method was used to form the sample group and the data was obtained using the online survey form. Convenience sampling method means collecting data by easily reaching people in the study group of the research (7).

Table 1. Distribution of research participants according to their demographic characteristics

Characteristics	Variables	n	%
Gender	Male	112	47.1
	Female	126	52.9
Department	Physical education teacher	65	27.3
	Coach Education	61	25.6
	Sports Management	112	47.1
Grade	1st Grade	44	18.5
	2nd Grade	55	23.1
	3rd Grade	59	24.8
	4th Grade	80	33.6
Total		238	100.0

Data collection tools

Personal Information Form: This form, which was prepared to be compatible with the sub-objectives of the research, is a self-information form designed to determine the demographic information of the participants, including the variables "Grade", "Department", "Gender", "Income status".

Metaverse Scale: In this study, the "Metaverse Scale" developed by Süleymanoğulları et al., (29) was used. Metaverse Scale is a 5-point Likert type scale. The responses are scored as 1 = Strongly Disagree and 5 = Strongly Agree. There are no reverse coded items in the scale. As the scores on the scale increase, the participants' attitudes, knowledge and awareness levels regarding the word Metaverse also increase. As a result of the analyses carried out by the researchers, Cronbach's Alpha values for the scale and its sub-dimensions were found to be .813 for the total scale, .805 for the technology factor, .732 for the digitalization factor, .705 for the social factor and .713 for the lifestyle factor. The Cronbach Alpha value obtained for this study was found to be .91 for the total scale, .90 for the technology factor, .73 for the digitalization factor, .85 for the social factor and .69 for the lifestyle factor. According to Alpar (37), it can be stated that scale reliability is ensured.

Data analysis

SPSS 22 program was used to analyze the data obtained. After the data was transferred to the internet, missing data analysis, which is perceived as a general problem for research in social sciences, was first applied. It is because the modern and classical statistical methods used were developed with the assumption that the data set is not incomplete (3,25,28). No missing data was found in the missing data control carried out in this direction. Then, the normality and linearity assumptions of the resulting data set were evaluated. It was observed that there was a linear relationship in the resulting scatter diagram. Additionally, Skewness and Kurtosis values were observed by observing the significance result of the Shapiro-Wilk test to determine whether the distribution was normal or non-normal. The fact that these values for the measurement tools used in the research are between -1.5 and +1.5 indicates that the data has a normal distribution (38). Then, independent groups t-test was used to compare the Metaverse awareness of the research group according to gender, and one-way analysis of variance ANAVO was used to compare according to income levels, department and grade variables. The significance level was taken as $p < 0.05$.

Ethical approval and institutional permission

For this research, it was decided that it was ethically appropriate in the decision numbered E-60263016-050.06.04-245459 and number 16 taken by Sivas Cumhuriyet University Scientific Research and Publication Ethics Board at its meeting dated 26.12.2022.

FINDINGS

Table 2. Descriptive statistics of participants' metaverse scale scores

Scale/Sub-Dimensions	n	Min	Max	Mean \bar{X}	Standard deviation (Sd)
Technology	238	1.00	5.00	3.45	0.046
Digitalization	238	1.00	5.00	3.48	0.046
Socialization	238	1.00	5.00	3.28	0.059
Lifestyle	238	1.00	5.00	3.45	0.048
Total	238	1.00	5.00	3.44	0.040

When Table 2 is examined, the mean score of the participants was determined as \bar{X} :3.44 for the total scale, \bar{X} :3.45 for the Technology sub-dimension, \bar{X} 3.48 for the Digitalization sub-dimension, \bar{X} :3.28 for the socialization sub-dimension and \bar{X} :3.45 for the lifestyle sub-dimension.

Table 3. Comparison of METAVERSE scale and sub-dimension scores of participants according to gender

Scale	Gender	n	\bar{X}	Sd	t	P
Technology	Male	112	3.37	0.57	-1.423	0.09*
	Female	126	3.53	0.65		
Digitalization	Male	112	3.40	0.63	-1.680	0.12
	Female	126	3.55	0.76		
Socialization	Male	112	3.28	0.65	-1.540	0.97
	Female	126	3.28	0.80		
Lifestyle	Male	112	3.42	0.85	-0.037	0.50
	Female	126	3.48	0.98		
Total	Male	238	3.38	0.73	-0.663	0.15
	Female		3.49	0.74		

When Table 3 was examined, a significant difference was detected between the Metaverse scale and its sub-dimensions in the Technology sub-dimension according to the gender variable ($t=-1.423$; $p<0.05$). No significant difference was detected in the scale total score and socialization, digitalization and lifestyle sub-dimensions.

Table 4. Comparison of metaverse scale scores of participants according to their departments

		n	\bar{X}	Sd	F	p	Bonferroni
Scale Total	PET (a)	65	3.39	0.61	0.575	0.63	-
	COA(b)	61	3.51	0.75			
	SMD(c)	112	3.42	0.53			
Technology	PET (a)	65	3.45	0.67	0.721	0.48	-
	COA(b)	61	3.54	0.88			
	SMD(c)	112	3.41	0.62			
Digitalization	PET (a)	65	3.36	0.72	1.413	0.24	-
	COA(b)	61	3.57	0.82			
	SMD(c)	112	3.50	0.68			
Socialization	PET (a)	65	3.19	0.80	1.089	0.33	-
	COA(b)	61	3.42	1.04			
	SMD(c)	112	3.25	0.91			
Lifestyle	PET(a)	65	3.30	0.84	0.251	0.77	-
	COA(b)	61	3.43	0.67			
	SMD(c)	112	3.62	0.74			

PET= Physical Education Teaching; COA= Coaching; SMD= Sports Management

The scores of the students included in the research from the Metaverse scale were compared with the department variable in which they studied. It can be stated that the difference between the scores of the students who participated in the research in Table 5 and the Metaverse scale and its sub-dimensions according to the department they are studying in is not statistically significant.

Table 5. Comparison of participants according to their cryptocurrency usage situation with the metaverse scale

Scale/Sub-dimension	Cryptocurrency Usage Situation	\bar{X}	Sd	t	p
Metaverse Scale	Yes	3.91	0.54	6.99	0.00*
	No	3.31	0.57		
Technology	Yes	4.05	0.73	6.71	0.00*
	No	3.29	0.61		
Digitalization	Yes	4.00	0.73	7.01	0.00*
	No	3.34	0.61		
Socialization	Yes	3.81	0.88	4.83	0.00*
	No	3.13	0.88		
Lifestyle	Yes	3.57	0.70	1.30	0.19
	No	3.42	0.74		

* p<0.05

An independent t test was applied to compare the scores of the participants in the study on the Metaverse scale and Cryptocurrency usage. As a result of the test, it is seen that there is a significant difference in the participants' Metaverse scale total score and technology, digitalization and socialization sub-dimensions ($p < 0.05$). It is seen that the averages of those who own crypto money are higher than those who do not own crypto money.

DISCUSSION AND CONCLUSION

When the international and national literature of the Metaverse concept is examined, it can be stated that its influence is undeniable today. It can be said that in the national literature, studies on Metaverse have been examined in many different fields, but Metaverse studies in the field of sports are generally few. For this reason, the study aimed to determine the attitude, awareness and knowledge levels of university students studying sports towards the concept of metaverse. In this regard, the information obtained by comparing the data obtained using the metaverse scale with the demographic characteristics of the participants will be evaluated in line with the literature below.

When the findings obtained as a result of the research are evaluated, it can be stated that the metaverse awareness of university students studying sports is high, according to the average score obtained from the metaverse scale and its sub-dimensions. In today's world, there is a technological transformation in communication and information technologies every ten years; It is mentioned that communication with computers in the 1990s, web in the 2000s, and mobile in the 2010s changed and that the main word of the paradigm of the 2020s is Metaverse (22). This result obtained is the age of information and technology, so people can access information in a short time. The fact that the concept of metaverse and metaverse is a concept that has come to the fore in the field of technology recently will explain the high metaverse awareness of university students. In addition, with the Covid-19 epidemic that has recently affected the whole world, the decision taken by the governments and the quarantine process of people have brought individuality to the fore, and as a result, people have turned to the internet environment to socialize. It can be stated that the individual who starts to spend more time than usual on the internet has an increased chance of encountering the word metaverse, which is one of the popular concepts of recent times, and as a result, metaverse knowledge and awareness has increased.

Lee (22) mentions that there is a technological transformation in communication and information technologies every decade in today's world such as communication with computers in the 1990s, the web in the 2000s, mobile in the 2010s, and that the main word of the paradigm of the 2020s is Metaverse. In this context, it is important to determine how aware the students of the faculty of sports sciences are about Metaverse technology in our study. Our study was carried out in line with this importance and the results obtained are as follows. In this study, where the Metaverse awareness of sports sciences faculty students was examined, a significant difference was detected between the Metaverse scale and its sub-dimensions in the Technology sub-dimension according to the gender variable ($t = -1.423$; $p < 0.05$). Female students' technology

awareness was found to be higher than male students. No significant difference was detected in the scale's total score and socialization, digitalization and lifestyle sub-dimensions. Aslan and Grge (5) concluded in their study titled "Teachers' awareness levels of teaching technologies and materials" that the awareness of female teachers is higher in percentage. In another study, akır and Ark (8) conducted a study titled "Examination of Metaverse Awareness of Faculty of Sports Sciences Students" and determined that there was a significant difference in favor of female students in the scale mean scores of the research group according to the gender variable. In general, we can say that the results of our study are parallel to the results of other studies.

When the Metaverse scale total score and sub-dimension scores of the participants were examined according to the income variable, a significant difference was detected between the total score, digitalization and technology sub-dimensions. As a result of the Benforonin test performed to determine the source of the difference, a significant difference was detected between the income level (10001 and above -5001 and 10000) and (5001 and 10000 -0-5000) and between the Technology sub-dimension and the Digitalization sub-dimension (10001 and above -5001 and 10000) and (5001 and 10000 -0-5000) according to the total score of the scale. It was determined that as the income level of the participating students increased, their Metaverse awareness also increased. In the study by Aksoy (2), it was found that, as a result of the analysis made according to the income variable, those with higher incomes had higher technology usage levels. Metaverse, which is a product of internet technology, requires certain technological hardware and products. Accessing this product and equipment requires a certain cost. Therefore, we can say that those with high income levels have a high level of awareness of technological products such as Metaverse.

According to the analysis results, where the Metaverse scale total score and sub-dimension scores of the participants were examined according to the department variable, no significant difference was found. akır et al. (8) could not find a significant difference in the mean scores of the students in their research group from the Metaverse awareness scale in terms of the department variable. We can say that there is no significant difference since there are no Metaverse-related courses in the course content of the students of the faculty of sports sciences and there are generally courses on the basic subjects of sports, and there is no situation that will affect the Metaverse awareness of the students according to their departments.

An independent t test was conducted to compare the scores of the participants on the Metaverse scale and their cryptocurrency usage. As a result of the test, it was determined that there was a significant difference in the participants' scores in the Metaverse scale total score and technology, digitalization and socialization sub-dimensions ($p < 0.05$). It is seen that those who own crypto money have higher Metaverse awareness levels than those who do not own crypto money. In their study, Yurtsızođlu and Akgl (36) found that there is a statistically significant difference in cryptocurrency perception and awareness level depending on the possession status. They concluded that those who own crypto money have a higher level of perception and awareness of crypto money. Today, there are 9351 cryptocurrencies, and 255 of these cryptocurrencies are associated with Metaverse (11). We can say that students investing in cryptocurrencies have a higher awareness of Metaverse as they are more likely to encounter cryptocurrencies related to Metaverse.

Nowadays, technologies such as Metaverse seem to be more prevalent in the field of sports. We encounter examples where Metaverse technology is used in training in many sports branches. This may make Metaverse technology important for the sports field. In this context, it is necessary to teach technologies such as Metaverse, which brings a different perspective to sports and contributes to sports, to the students of the faculty of sports sciences, which provides human resources in the field of sports, and to ensure that they are aware of technological innovations. Therefore, as a recommendation of our study, we can say that courses that introduce future technologies and make them aware of them should be included in the course contents of the Faculty of Sports Sciences. In addition, by informing the lecturers about the metaverse, using technologies such as metaverse technology in the course can increase the interest and awareness of the students.

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