Journal of Educational Technology & Online Learning
Volume 7 | Issue 2 | 2024
http://dergipark.org.tr/jetol

Opinions and expectations of instructors on metaverse applications in higher education

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Suggested citation: Çalışkan, G. & Maya İ. (2024). Opinions and expectations of instructors on metaverse applications in higher education, *Journal of Educational Technology & Online Learning*, 7(2), 273-285.

Highlights

- The study aimed to determine the opinions and expectations of the instructors on metaverse application in higher education.
- Instructors believe that education and management processes in higher education will change with the metaverse application.
- The future studies can be focus to determine students' opinions on metaverse applications in higher education.
- Further research is needed on student perspectives and the potential negative impacts of Metaverse applications

Article Info: Research Article

Keywords: *Metaverse, higher education, instructor*

Abstract

Nowadays, technology is constantly evolving. The use of developing technologies in daily life brings transformation. One of the areas where transformation is inevitable is education. Developing technologies cause the emergence of new applications and paradigms in education. One of these applications is Metaverse, which have increased in popularity in recently. Interest in Metaverse is increasing day by day at higher education. In addition to the benefits that Metaverse provide to the education, it also has some negative effects. In order to benefit from the benefits provided by metaverse at the highest and to minimise the negativities that will arise with the application, multifaceted studies on metaverse should be carried out. In this study, it is aimed to determine the opinions and expectations of the instructors about metaverse in higher education. The research was designed with phenomenology. In this study, a semi-structured interview form was used to determine the opinions of instructors. 23 instructors who work at Canakkale Onsekiz Mart University participated in the study. As a result of the study, it was concluded that the instructors think that education and management processes in higher education will change with metaverse. The studies can be conducted to determine students' opinion on metaverse.

1. Introduction

Today, technology is developing rapidly and is finded to use as a facilitating factor in all areas of life, from management to trade, from trade to banking, from banking to health. Although constantly developing technology facilitates the social and daily lives of individuals, it also makes comprehensive changes and transformations inevitable in the areas where it is used. One of the areas where technology finds usage and transformation is the education sector. The use of technology at all levels of education is becoming widespread day by day (Sevgi & Yılmaz, 2022). The continuous development of technology and the widespread use of it lead to the emergence of new paradigms and practices in the education sector. One of these applications in the field of education is Metaverse applications, which are created by combining technologies such as augmented reality, virtual reality and mixed reality, which have garnered increased attention in recent years.

The concept of Metaverse was first introduced in the novel "Snow Crash" written by Neal Stephenson in 1992 (Çiğdem, 2022). Metaverse is defined as a 3-D virtual world where individuals can interact among

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Doi: http://doi.org/10.31681/jetol.1439812
Received 19 Feb 2024; Revised 30 May 2024; Accepted 30 May 2024
ISSN: 2618-6586.

themselves or with their environment, where there are no physical limitations, and which contains elements of the real world (Owens et al., 2011). Metaverse is the virtual world that evolves with real world dynamics (Hwang et al., 2023). It allows individuals to express themselves in a three-dimensional virtual environment, interact with others and have different experiences. When considered in this context, it can be said that the concept of metaverse has an important potential to enrich and transform education and learning processes, as it does not have physical limitations, offers individuals the opportunity to interact, and allows them to experience the real world in a virtual environment as it exists.

With metaverse applications in education, individuals find a new area for socialization and communication, high creativity, freedom of sharing and the opportunity to gain different experiences in a virtual environment (Kalınkara & Özdemir, 2022). With the active use of Metaverse applications in the field of education, the cost of education can be reduced, students can achieve more success, virtual interaction can be provided, the risks arising from real-life applications can be minimized and attractive learning environments can be offered to students (Kshetri et al., 2022; Serpil, 2022). In addition, students can understand complex concepts more easily in Metaverse applications (Salloum et al., 2023).

As can be seen, it is possible to use metaverse applications at all stages of the education system due to the benefits it provides. However, the higher education level, which is expected to be a pioneer in the implementation of innovations in the field of education, also comes to the fore with metaverse applications. With Metaverse applications, positive effects can be achieved at all levels of education, especially at the higher education level, including practical training such as piloting, engineering, mathematics (Kefalis & Drigas, 2019). With metaverse applications, physical barriers in education and training can be eliminated, and equal opportunities can be provided regardless of race and gender (Duan et al., 2021). Students who experience metaverse applications in education processes can easier to learn and their motivation can be positively affected (Hwang et al., 2023; Jeon & Jung, 2021). In addition, the use of metaverse applications in education offers accessibility, flexibility and interactivity as well as comprehensive and personalized learning experiences (Khalil et al., 2023; Prakash et al., 2023).

When the relevant literature is examined, it is seen that the use of metaverse applications in education provides many advantages for education-training processes, as well as some limitations or disadvantages (Kalınkara & Özdemir, 2022; Mystakidis, 2022; Shwedeha, 2024). With the use of metaverse applications in education, negativities such as high cost, data privacy, security concerns, lack of access to infrastructure, technical problems and addiction are generally encountered in the process (Pregowska et al., 2024; Serpil, 2022). Prakash et al. (2023) stated in their study that the problems experienced by users with metaverse applications in education are generally privacy, security concerns, technical limitations and not having sufficient digital literacy skills. With Metaverse applications, breach of confidentiality problems that may arise during the implementation process may cause misuse of user information (Kye et al., 2021). In addition to studies arguing that the use of metaverse applications in educational processes has a positive impact on equality of opportunity in education, there are also studies that argue that the inability of users to access applications due to the high cost and advanced technical infrastructure required may disrupt equality of opportunity in education (Mystakidis, 2022). In order for metaverse applications to be used effectively in educational processes, instructional designers and instructors should have sufficient technical knowledge on metaverse applications (Kye et al., 2021; Shwedeha, 2024). When considered in this context, it can be said that the lack of sufficient technical knowledge of instructional designers and instructors may cause limitations in the process of using Metaverse applications in education. In addition to technical and infrastructure problems and breach of confidentiality problems in metaverse applications, there are also problems such as users' confusion between their real identities and virtual identities in metaverse applications, their behavior of pretending to be different people than they are, and users' problems of adaptation to virtual reality can also be encountered (Kalınkara & Özdemir, 2022). In metaverse applications, differentiation is experienced in management processes as well as education- training processes. For this reason, in order to prevent the differentiation from turning into a problem in the

implementation process, educational administrators need to gain special competencies for metaverse applications (Serpil, 2022).

Although the interest in the use of metaverse applications supported by augmented reality, virtual reality and mixed reality in educational processes is increasing day by day, the developments in this field are still in the model/testing phase (Narin, 2021). When the relevant literature is evaluated, it is seen that scientific studies on the subject remain limited in number and diversity, although the interest in metaverse applications in education has increased (Alkan & Bolat, 2022; Onecha, et al., 2023). One of the educational levels where Metaverse applications are carried out at the model/testing phase and studies are limited is higher education. When the relevant literature is evaluated, it is seen that some higher education institutions operating in the national (Middle East Technical University, Istanbul University, Atatürk University, etc.) or international (Fisk University, Morehouse University, Northern Illinois University, etc.) field of education and training have developed virtual campus/virtual university environments with metaverse applications or continue their studies to develop them. Considering that virtual campus/virtual university applications in the metaverse may become indispensable educational environments for higher education institutions in the future, higher education institutions should have completed their readiness in terms of infrastructure, human resources, scientific research and users' knowledge and skills for practice (Göçen, 2022).

Although Metaverse applications are an important opportunity to provide radical changes in higher education, they also contain some threats/limitations (Pregowska et al., 2024). When evaluated in this context, one of the issues that need to be studied is the opinions and expectations of instructors towards metaverse applications. The instructors, as the main actors of higher education, are the people who design, implement and evaluate metaverse applications. Determining the opinions and expectations of instructors towards metaverse applications has a significant and positive impact on increasing the effectiveness and prevalence of these applications (Pregowska et al., 2024). When the revalent literature exemined, it is seen that there is not enough study to determine the opinions and expectations of instructors towards metaverse applications in higher education. For this reason, it can be said that conducting studies to determine the opinions of instructors towards metaverse applications will make a significant contribution to the literature.

1.1. Aim of the Study

In this study, it is aimed to determine the opinions and expectations of instructors regarding the metaverse applications developed/to be developed in the field of higher education. Within this framework, answers to the following sub-research questions were sought:

1. What are the instructors' opinions on the concept of metaverse?
2. What are the instructors' opinions on the change that the concept of metaverse will bring about in the understanding of higher education?
3. What are the instructors' opinions on the opportunities that metaverse applications will offer to higher education?
4. What are the instructors' opinions on the threats that metaverse applications will pose in higher education?
5. What are the instructors' expectations from metaverse applications in higher education?
6. What are the instructors' expectations from administrators in metaverse applications in higher education?
7. What are the instructors' opinions on the change that metaverse applications in higher education will create in the management structure?
8. What are the instructors' opinions on the change that metaverse applications in higher education will create in the roles of in-class/out-of-class lecturers?
9. What are the instructors' opinions on the change that metaverse applications will create in the management processes in higher education?
10. What are the instructors' opinions on the change that metaverse applications will create in the roles of administrators in higher education?

11. What are the instructors' suggestions for the planning and development of metaverse applications in higher education?

2. Methodology

2.1. Research Model

This study was designed with phenomenology, one of the qualitative research models. The phenomenological approach, centered on phenomena that are acknowledged yet not entirely grasped, facilitates a comprehensive and nuanced exploration of individuals' perceptions, experiences, and perspectives (Yıldırım & Şimşek, 2016). In this study, the concept of "Metaverse" and "Metaverse Applications in Higher Education", which have recently become popular and attracted the attention of researchers but have not yet been fully experienced by individuals, are accepted as phenomena. With the phenomenological study conducted, the perceptions and perspectives of instructors regarding metaverse applications in higher education were explained with a holistic approach.

2.2. Study Group

The population of the study consists of instructors who work at at Çanakkale Onsekiz Mart University (ÇOMÜ). In the study, snowball sampling method was used to determine the study group. With the snowball sampling method, a reference person related to the subject of the study is identified at the beginning of the research and other participants are reached through the selected person (Şahin, 2014). The interview form, consisting of semi-structured open-ended questions developed by the researchers, was sent via e-mail to the instructors which determined by snowball sampling method. Twenty-three instructors (three professors, four associate professors, six assistant professors, eight lecturers, and two research assistants) participated in the data collection process on a voluntary basis.

2.3. Data Collecting Tools

A semi-structured interview form was developed by the researchers in order to collect data within the scope of the research. In the first stage of the development process of the interview form, the relevant literature was reviewed and a draft interview form with 12 questions was created by the researchers. In the second stage, expert opinions were obtained from five instructors who are experts in the field of "Computer Education and Instructional Technology" and "Educational Administration and Supervision". In the third stage, the draft interview form was finalized by taking expert opinions into consideration and an 11-questions semi-structured interview form was developed.

2.4. Data Collection and Analysis

The interview form consisting of semi-structured open-ended questions developed within the scope of the research was transferred to the digital environment (Google Forms). The sharing link of the data collection tool was sent to the instructors constituting the study group via e-mail.

The data collected from the instructors whose participated to the study were analyzed by inductive content analysis. Inductive content analysis focuses on the foundations of the phenomenon(s) subject to the research (Baltacı, 2019). While analyzing the data in content analysis, the first coding is done, themes are created from the codes determined, and finally the findings are interpreted (Yıldırım & Şimşek, 2016). In the analysis of the data within the scope of the research, the coding process was carried out by the researchers, and the themes were obtained by verifying the generated codes with the formula (reliability = consensus / (consensus + disagreement) x 100) determined by Miles and Huberman (1994). While creating the research findings, the instructors who participated in the research were coded as "I-1, I-2". The research findings were presented by considering the themes and codes obtained and finally interpreted by supporting them with the literature.

3. Findings

The summary of findings are presented in Table 1.

3.1. The Instructors' Opinions on the Concept of Metaverse

In this study, the instructors who participated in the study were asked to answer the question "Can you explain what the concept of metaverse means to you?". When the answers given to the related question were analyzed, it was seen that all instructors defined the concept of metaverse as "virtual world", "new world" or "fictionalized world" in general. In other words, it was found that all of the lecturers participating in the study positioned the metaverse as a new formation/world separate from the real world. Some l instructors' opinions on this issue are as follows:

"Metaverse refers to a virtual world where people from all over the world can come together by creating an avatar." (I-11).

"Metaverse is a new universe parallel universe where the real world will move to the virtual environment." (I-13).

" A fictional universe as real thanks to interfaces." (I-5).

"The new space, the new world, the digital world is a medium where everything can be redone and reorganized, where new perspectives on life and living can be watered." (I-15).

3.2. The Instructors' Opinions on the Change that the Concept of Metaverse Will Bring About in the Understanding of Higher Education

In this study, the instructors who participated in the study were asked to answer the question "What changes do you think the concept of metaverse will bring about in the understanding of higher education?". When the answers given to the related question were analyzed, it was concluded that the instructors were of the opinion that change in higher education is inevitable with the concept of metaverse and that this change will occur in "management and education and training processes". Some instructors' opinions on this issue are as follows:

" The metaverse will bring about a significant transformation on education and management process in higher education " (I-10).

"The concept of metaverse will bring about a change in the understanding of higher education. The traditional campus and university understanding will be replaced by virtual universities and virtual campuses, education and training activities will take place in virtual classrooms and people will participate to them with their avatars." (I-13).

However, an instructor was of the opinion that the change that metaverse practices will bring about in the understanding of higher education may vary according to the structure/type of the institution. The opinion of the relevant instructor on this issue is as follows:

"Since state universities cannot adapt to technological innovations quickly, I think it cannot bring about a significant change. I think private universities can adapt to metaverse systems more than state universities." (A11).

3.3. The Instructors Opinions on the Opportunities that Metaverse Applications Will Offer to Higher Education

In this study, the instructors who participated in the study were asked to answer the question "What opportunities do you think metaverse applications can offer to higher education?". When the answers given to the related question were analyzed, it was seen that almost all of the instructors thought that metaverse applications would offer various opportunities to higher education. It was found that the opinion of the

instructors regarding the opportunities that metaverse applications will offer to higher education are generally gathered around "more effective teaching, especially applied trainings", "equal opportunities for disadvantaged individuals", "communication" and "providing extracurricular environments". Some instructors' opinions on this issue are as follows:

"Especially for the trainings that need to be given practically, changing from 2D to 3D will bring ease of understanding and comprehension." (I-1).

" It will offer better education and practice opportunities to students and academics, especially in the fields of medicine, architecture and engineering. In addition, many students will be involved in education and training processes on equal terms. (I-2).

"It will be useful in applied trainings. It can be more educational and instructive with virtual environments." (I-5).

"..... is an opportunity where disadvantaged individuals can have equal conditions with their peers with the right practices." (I-18).

"In addition to the opportunities provided by distance education, people will be able to utilize more spaces in the way they want. For example, while in distance education there is only the option of attending synchronous or asynchronous course, instead of attending a course in metaverse, students can also benefit from other environments and facilities on campus, such as the library, etc., and metaverse can also offer new and different communication opportunities." (I-13).

However, it was also observed that some instructors thought that metaverse applications would not offer a fully holistic opportunity to the process. Some instructors' views on this issue are as follows:

"I think that it will not offer much opportunity except for computer and software departments. For example, while participation in a seminar/panel in the field of social sciences may not be very realistic in face-to-face and online platforms, it does not seem very convincing for people to come together and participate in metaverse." (I-10).

3.4. The Instructors' Opinions on the Threats that Metaverse Applications Will Pose in Higher Education

In this study, the instructors who participated in the study were asked to answer the question "What threats do you think metaverse applications may pose in higher education?". When the answers given to the relevant question were analyzed, it was concluded that four instructors were of the opinion that metaverse applications would not pose any threats in the process, while the other instructors were of the opinion that they could pose threats such as "cyber security", "protection of personal data", "inability to access technology" and "psychological/identity problems". Some instructors' opinions on this issue are as follows:

"As in every field, threats such as cyber security and easy acquisition of personal data may increase and also the crime rate may increase." (I-2).

"The problems caused by the digital world can also be encountered here. Especially the sharing of personal data and its malicious use can cause problems." (I-15).

"Considering equal opportunities, there may be a threat to students who do not have the opportunity to access metaverse applications." (I-19).

"It is possible to have negative psychological effects on students, such as technology addiction and cyberbullying." (I-14).

" It can also cause individuals to lose themselves in the digital environment." (I-2).

3.5. The Instructors' Expectations from Metaverse Applications in Higher Education

In this study, the instructors who participated in the study were asked to answer the question "What are your expectations from metaverse applications in higher education?". When the answers given to the related

question were analyzed, it was concluded that almost all of the instructors were not fully determined about their expectations from metaverse applications and did not give meaningful/clear answers to the related question. It was observed that the instructors who expressed their opinions about their expectations were generally in the subjects of "continuity of development", "flexibility", "facilitation" and "ensuring permanence in learning". Some instructors' opinions on this subject are as follows:

"I expect continuous progress and development." (I-7).
"I expect it to offer more flexibility to learners and teachers." (I-13).
"I expect it to be more facilitative in practice trainings." (I-5).
"To make life experiences more permanent." (I-17).

3.6. The Instructors' Expectations from Administrators in Metaverse Applications in Higher Education

In this study, the instructors who participated in the study were asked to answer the question "What are your expectations from administrators in metaverse applications in higher education?". When the answers given to the related question were analyzed, it was concluded that the instructors had different expectations regarding the behaviors exhibited by the administrators in metaverse applications. It was observed that the instructors generally expected the administrators to "exhibit lea dership behavior", "be visionary", "be open to innovations", "act in a planned and systematic manner", "improve themselves", "pay attention to ethical principles", "give importance to stakeholder participation" and "be flexible". Some instructors' opinions on this issue are as follows:

"They should plan and present the opportunities brought by technology in a very good way." (I-2).
"I expect them to have a vision and assume an initiating role in the organization." (I-4). "They should be able to guide their colleagues and to be open to improvement." (I-18).
"They need to demonstrate a facilitative and supportive leadership and a participatory approach in planning and implementation processes." (I-21).
"I expect them to adapt to the new world and improve themselves because there is the highest resistance to adaptation" (I-22).

3.7. The Instructor' Opinions on the Change that Metaverse Applications will Create in Management Structure in Higher Education

In this study, the instructors who participated in the study were asked to answer the question "What are your opion on the change that metaverse applications will create in the management structure (such as subordinate-superior relations, vertical relations, horizontal relations, status, bureaucracy) in higher education?". When the answers given to the related question were analyzed, it was concluded that almost all of the instructors thought that "bureaucratic management approach will decrease" and "horizontal communication channels will be used more actively instead of subordinate-superior relations" will gain importance in the management structure of higher education with metaverse applications. Some instructors' opinions on this issue are as follows:

"Metaverse applications in higher education will also affect subordinate relations and bureaucracy. Since people can have roles with different names in the virtual environment, I think that more horizontal communication channels will emerge rather than subordinate- superior relationships." (I-10).
"Considering that artificial intelligence will be actively used in management processes, it can be said that bureaucratic processes will decrease or disappear in the structuring of management. I believe that this situation will lead to a weakening of superior-as-subordinate relations in Metaverse and an increase in horizontal relations rather than vertical relations." (I-13).
"I think that more horizontal relations will increase." (I-17).

3.8. The Instructors' Opinions on The Change That Metadata Applications in Higher Education Will Create in The Roles of in-Class/ıut-of-Classroom

In this study, the instructors who participated in the study were asked to answer the question "What are your opinions on the change that metaverse applications in higher education will create in your in-class and out-of-class roles?". When the answers given to the related question were analyzed, it was seen that the instructors had different opinions about the new roles of the instructors. While some of the instructors stated that the instructors would "increase their guidance role" and "gain a fatherly leadership role" in/out of the classroom, some of them did not express any opinion on the related question or stated that metaverse applications would not cause any change in the roles of the instructors in/out of the classroom. Some instructors' opinions on this issue are as follows:

"It can create additional roles. It will be necessary to provide information guidance, to know when and how to be involved in practices and to take a leading role for students. You need to be very interrogant, investigative, critical and innovative." (I-4).

"Instead of being seen as a source of knowledge, instructors *will be seen as a guide in accessing and applying knowledge." (I-19).*

"Instructors should exhibit a more fatherly leadership both inside and outside of the classroom." (I-13).

" I predict that the role of the instructors will not change." (I-22).

3.9. The Instructor' Opinions on the Change that Metaverse Applications will Create in Management Processes in Higher Education

In this study, the instructors who participated in the study were asked to answer the question "What are your opinions on the change that metaverse applications in higher education will create in management processes (decision making, planning, supervision, leadership, motivation, communication)?". When the answers given to the related question were analyzed, it was concluded that almost all of the instructors thought that metaverse applications would cause changes in "decision making", "planning", "supervision", "leadership", "motivation" and "communication" processes.

"The decision-making process can be accelerated due to its time and space independence. Multiple planning and strategic planning may be required in the planning dimension. Self-control practices related to the supervision process will become more important. It can provide everyone with the opportunity to lead. Leadership behaviors such as shared leadership and self-leadership are likely to gain importance. It will motivate all members more (provided that they are open to informatics). A colorful, fast and open to changes world is expected to increase motivation. It will be open to multiple communication and it will be possible to obtain multiple data." (I-3).

"Metaverse practices in higher education will bring transformation in management processes. Especially the technological leadership characteristics of Administrators will need to come to the forefront. In addition, tools related to motivation will also change. This will be reflected in planning processes and therefore in supervision processes." (I-10).

However, contrary to the instructors who thought that there would be a change in management processes with metaverse applications, it was also seen that there were instructors who thought that there would be no change and even negative developments. Some instructors' opinions on this issue are as follows:

"Since the communication process will be directly online with the Metaverse, there may be weakening and negativity in communication processes. I don't think there will be a change in decision-making processes. It may become difficult for managers to reach people in the motivation process." (I-13).

3.10. The Instructors' Opinions on The Change That Metaverse Applications Will Create in The Roles of Administrators in Higher Education

In this study, the instructors who participated in the study were asked to answer the question "What are your opinions on the change that metaverse applications will create in the roles of administrators in higher education?". When the answers given to the related question were analyzed, it was seen that the instructors had different opinions about the new roles of administrators. While some of the instructors stated that the "technological leadership role" and "guide/mentor role" of the administrators will increase, some of them stated that the roles of administrators will decrease in metaverse applications compared to traditional applications. Some instructors stated that there would be no change in administrator roles. Some instructors' views on this issue are as follows:

"...it will be inevitable for them to be IT leaders. Administrators who are IT leaders are expected to be more successful." (I-4).

"Metaverse applications in higher education will also change the roles of administrators. The technological leadership role needs to be developed..." (I-10).

"Reduces the roles of the manager and saves time." (I-12).

"I don't think it creates a change in the roles of administrators." (I-16).

3.11. The Instructors' Opinions on The Change That Metaverse Applications Will Create in The Roles of Administrators in Higher Education

In this study, the instructors who participated to the study were asked to answer the question "What are your suggestions for the planning and development process of metaverse applications in higher education?". When the answers given to the related question were analyzed, it was seen that almost all of the instructors made different suggestions to be taken into consideration in the planning and development process of metaverse applications. It was concluded that the instructors generally suggested "acting systematically and in a planned manner", "following the developments in the field", "getting support from stakeholders and experts", "paying attention to ethical principles", "training users" and "developing applications accessible to everyone" in the planning and development processes. Some instructors' opinions on this issue are as follows:

"An important planning process should be established and a follow-up system should be developed." (I-2).

"Developments can be followed carefully and the parts that will contribute positively to education and training can be integrated." (I-18).

"Exchanging opinions by Coming together with all stakeholders, administrators, instructors*" (I-5).*

"I say ethics first, ethical boundaries should definitely be drawn and an infrastructure should be created, and then unique designs should be made for each institution." (I-23).

"All stakeholders need to be trained in metaverse Instructional design, matevarse content design, metaverse design, metaverse design, avatar design, metaverse artificial intelligence applications, as too many components and factors will need to change and new areas of expertise and experts will be needed." (I-16).

"Instructors and especially administrators should be informed about the advantages, limitations and threats of meteaverse applications." (I-10).

"Instructional technologists should be utilized while developing Metaverse applications. Pedagogy should be utilized in the development process. Affordable interfaces that everyone can access should be developed." (I-13).

Table 1.

Summary of Findings

Researh Questions	Themes/Summary of Findings
The Instructors' Opinions on the Concept of Metaverse	• virtual world • new world • fictionalized world
The Instructors' Opinions on the Change that the Concept of Metaverse Will Bring About in the Understanding of Higher Education	• To change will occur in "management and education and training processes" • the change will bring to higher education may vary according to the structure/type of the institution
The Instructors Opinions on the Opportunities that Metaverse Applications Will Offer to Higher Education	• more effective teaching especially applied trainings • equal opportunities for disadvantaged individuals • communication • providing extracurricular environments
The Instructors' Opinions on the Threats that Metaverse Applications Will Pose in Higher Education	• cyber security • protection of personal data • inability to access technology • psychological/identity problems
The Instructors' Expectations from Metaverse Applications in Higher Education	• continuity of development • flexibility • facilitation • ensuring permanence in learning
The Instructors' Expectations from Administrators in Metaverse Applications in Higher Education	• to exhibit leadership behavior • to be visionary • to be open to innovations • act in a planned and systematic manner • improve themselves • pay attention to ethical principles • give importance to stakeholder participation • to be flexible
The Instructor' Opinions on the Change that Metaverse Applications will Create in Management Structure in Higher Education	• bureaucratic management approach will decrease • horizontal communication channels will be used more actively instead of subordinate-superior relations
The Instructors' Opinions on The Change That Metadata Applications in Higher Education Will Create in The Roles of in-Class/ıut-of-Classroom	• increase their guidance role • gain a fatherly leadership role in/out of the classroom
The Instructor' Opinions on the Change that Metaverse Applications will Create in Management Processes in Higher Education	• To change will occur in "decision making", "planning", "supervision", "leadership", "motivation" and "communication" processes
The Instructors' Opinions on The Change That Metaverse Applications Will Create in The Roles of Administrators in Higher Education	• "technological leadership role" and "guide/mentor role" of the administrators will increase, • the roles of administrators will decrease in metaverse applications compared to traditional applications
The Instructors' Opinions on The Change That Metaverse Applications Will Create in The Roles of Administrators in Higher Education	• acting systematically and in a planned manner • following the developments in the field • getting support from stakeholders and experts • paying attention to ethical principles • training users • developing applications accessible to everyone

4. Conclusion, Discussiıon and Suggestions

In this study, It is aimed to determine the opinions and expectations of instructors regarding the metaverse applications developed/to be developed in the field of higher education. It was concluded that the instructors defined the concept of metaverse as "virtual world", "new world" or "fictionalized world". It is seen that these definitions are similar to the definitions of metaverse in the literature (Hwang et al., 2023; Owens et al., 2011). When considered in this context, it can be said that the instructors conceptually understand the concept of metaverse correctly Along with Metaverse applications, there are differentiations in both education and management processes (Serpil, 2022). As a result of the study, it was founded that instructors think that change in "management and education processes" is inevitable with the use of metaverse applications in higher education. The relevant opinions of instructors support the literature. With Metaverse applications, positive results can be obtained in educational activities that include application-oriented training (Kefalis & Drigas, 2019), and complex concepts can be understood more easily by students (Salloum et al., 2023). In addition, metaverse applications can contribute to providing equal opportunities in education (Duan et al., 2021) and create new opportunities for students to socialize and communicate (Kalınkara & Özdemir, 2022). As a result of the study, it was founded that the opinions of the instructors regarding the opportunities that metaverse applications will offer to higher education are generally gathered around "more effective teaching, especially applied trainings", "equal opportunities for disadvantaged individuals", "communication" and "providing extracurricular environments". When considered in this context, the research results support the literature.

As a result of the study, it was founded that instructors see the threats that may arise with the use of metaverse applications in higher education as "cyber security", "protection of personal data", "inability to access technology" and "psychological/identity problems". It is seen that the relevant opinions of the instructors are similar to the literature (Kalınkara & Özdemir, 2022; Kye et al., 2021; Mystakidis, 2022; Serpil, 2022; Pregowska et al., 2024). Within the scope of the research, it was concluded that the instructors could not fully reveal their expectations from the metaverse applications, but they had an expectation from metaverse applications in terms of "continuity of development", "flexibility", "facilitation" and "ensuring permanence in learning". It was concluded that the expectations of the instructors were similar to the opportunities that the metaverse applications mentioned in the literature (Khalil et al., 2023; Kshetri et al., 2022; Prakash et al., 2023; Serpil, 2022). In other words, it can be said that the expectations of instructors are parallel to the opportunities offered by metaverse applications.

In this study, it was founded that instructors have different expectations regarding the behaviors that administrators should exhibit in metaverse practices. It was concluded that instructors expect administrators to "exhibit leadership behavior", "be visionary", "be open to innovations", "act in a planned and systematic manner", "improve themselves", "pay attention to ethical principles", "give importance to stakeholder participation" and "be flexible". In addition, it was concluded that instructors think that with metaverse applications, "bureaucratic management approach will decrease" and "horizontal communication channels will be used more actively instead of subordinate-superior relations" will gain importance in the management structure of higher education. It was concluded that the differentiation expectations of the instructors regarding the management structure are generally similar to the literature (Serpil, 2022). In addition, it has been concluded that there is no consensus on the changes that may arise with the management processes in higher education with metaverse applications, some instructors think that management processes will not change, while others think that it will cause changes in "decision-making", "planning", "supervision", "leadership", "motivation" and "communication" processes.

As a result of the study, it was founded that the instructors had different opinions about the changes that would occur in their roles with the Metaverse applications. While some of the instructors stated that their "guidance role will increase" and "they will gain a paternalistic leadership role" in/out of the classroom, some of them did not express an opinion on the related question or stated that Metaverse applications will not cause any change in the roles of lecturers in/out of the classroom. In addition, it was concluded that the

instructors had different opinions on the changes that would occur in their own roles with Metaverse applications, as well as the changes that would occur in the roles of administrators. It has seen that some instructors think that the "technological leadership role" and "guide/mentor role" of administrators will increase, while others think that there will be no change in the roles of administrators in metaverse applications compared to traditional applications.

In this study, it was founded that the instructors offered constructive suggestions for the planning and development process of metaverse applications in higher education. It was seen that the suggestions offered by the instructors regarding the planning and development processes of metaverse applications were generally as follows: "acting systematically and in a planned manner", "following the developments in the field", "getting support from stakeholders and experts", "paying attention to ethical principles", "training users" and "developing applications accessible to everyone". When the relevant literature is evaluated, it is seen that one of the factors affecting the effectiveness of metaverse applications is that users do not have sufficient technical knowledge and digital literacy (Kye et al., 2021; Prakash et al., 2023; Serpil, 2022; Shwedeha, 2024). When considered in this context, it can be said that the instructors' offering to "train users" regarding metaverse applications is a suggestion to eliminate one of the factors affecting the effectiveness of metaverse applications in the literature.

As a result of the study, it was founded that the instructors have different opinions about the changes that will arise with their roles and the roles of administrators with metaverse applications. In this context, more scientific studies can be conducted to determine the roles of instructors and administrators in metaverse practices in future research. In addition, it was aimed to determine the opinions and expectations of the lecturers regarding the metaverse practices in the field of higher education. In future studies, it can be conducted to determine students' opinions on metaverse aplications in higher education and to determine of students' expectations from instructors and administrators in related practices. In addition, scientific studies can be conducted to evaluate the change that metaverse applications will bring to the understanding of higher education, taking into account the structure/type of the higher education institution (public, foundation, research university, etc.).

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