THE RELATIONSHIP BETWEEN MANAGEMENT AND INFORMATION SYSTEMS STUDENTS' E-LEARNING STYLES AND ATTITUDES TOWARDS E-LEARNING IN TURKEY DURING COVID-19 PANDEMIC

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PLAGIARISM

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

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ABSTRACT IN TURKISH

Bu çalışma Covid-19 pandemisi döneminde e-öğrenmeyi deneyimleyen Yönetim Bilişim Sistemleri Bölümü öğrencilerinin e-öğrenme stilleri ve e-öğrenmeye yönelik tutumlarının arasındaki ilişkiyi cinsiyet ve sınıf düzeyleri bakımından araştırmayı amaçlamaktadır. Çalışma 114 katılımcı ile yapılmıştır. Bu çalışmada Gülbahar ve Alper'in (2017) Elektronik Ortamlar için E-Öğrenme Stilleri Ölçeği ile Haznedar ve Baran'ın (2012) E-Öğrenmeye Yönelik Genel Tutum Ölçeği uygulanmıştır. Toplanılan veriler SPSS ile analiz edilmiştir. Normallik testleri sonucunda verilerin normal dağılmadığı bulunmuştur. Bu nedenle parametrik olmayan testler ileri düzey analizler için kullanılmıştır. İki gruba kadar, grupları karşılaştırmak için Mann-Whitney U testi kullanılmıştır. Üç ve üçten fazla gruplar için Kruskal Wallis Testi uygulanmıştır. Bu testin sonucu anlamlı bir farklılık gösterdiğinde, bu anlamlı farklılığın hangi gruplar arasında olduğunu bulmak için ikili gruplar halinde Mann-Whitney U testi uygulanmıştır. E-öğrenme stilleri ile e-öğrenmeye yönelik tutum arasındaki korelasyonu bulmak için veriler normal dağılmadığından Spearman Korelasyon analizi yapılmıştır. Sonuçlar görsel-işitsel öğrenme stilinin katılımcılar arasında en çok sahip olunan öğrenme stili olduğunu göstermiştir. E-öğrenmeye yatkınlık puanının yüksek olması katılımcıların e-öğrenmeye karşı pozitif tutumları olduğunu gösterirken bu skorun düşük olması katılımcıların e-öğrenmeye negatif tutumları olduğunu göstermektedir. E-öğrenmeden kaçış skorları ters kodlama ile elde edilniştir. Bu nedenle e-öğrenmeden kaçış skorlarının yüksek olması katılımcıların e-öğrenmeye pozitif tutumları olduğunu gösterirken, bu skorun düşük olması katılımcıların e-öğrenmeye negatif tutumları olduğunu göstermektedir.

Uygulanan istatistiksel testlerin sonuçları bağımsız öğrenme stiline sahip katılımcıların e-öğrenmeye yatkınlık ve e-öğrenmeden kaçış puanları ile pozitif ve anlamlı ilişkisi olduğunu göstermiştir. Görsel-işitsel öğrenme stiline sahip olanların sonuçlarının e-öğrenmeye yatkınlık ve e-öğrenmeden kaçış puanları ile arasında pozitif ve anlamlı bir ilişki olduğu görülmüştür. Sözel öğrenme stiline sahip olanların sonuçlarının e-öğrenmeye yatkınlık puanları ile arasında pozitif ve anlamlı bir ilişki olduğu görülmüştür. E-öğrenmeden kaçış sonuçlarında cinsiyete bağlı olarak istatistiksel bir farklılık olduğu görülmüştür. E-öğrenmeye yatkınlık ve e-öğrenmeden kaçış sonuçlarında sınıf düzeyleri açısından istatistiksel olarak anlamlı farklılıklar olduğu

saptanmıştır. Ek olarak bağımsız öğrenme, aktif öğrenme ve sözel öğrenme sonuçları incelendiğinde cinsiyetler arasında istatistiksel olarak anlamlı bir farklılık olduğu görüşmüştür. Yapılan testler sonucunda sınıf seviyelerine bağlı olarak bağımsız öğrenme, sosyal öğrenme, aktif öğrenme, mantıksal öğrenme, görsel-işitsel öğrenme, sözel öğrenme ve sezgisel öğrenme stillerinde istatistiksel olarak anlamlı değişiklikler olduğu saptanmıştır.

Anahtar Kelimeler: E-Öğrenme, E-Öğrenmeye Yönelik Tutum, Öğrenme

ABSTRACT

This research aims to investigate the relationship between e-learning styles and attitudes towards e-learning of Management Information Systems students who have experienced e-learning during Covid-19 pandemic and the change in terms of gender and grade level. This study was conducted with 114 participants. In this study Gülbahar and Alper's (2014) E-Learning Styles Scale for Electronic Environments and Haznedar and Baran's (2012) General Attitudes Towards E-Learning instrument were used. The data that gathered from the instruments interpreted via SPSS. After the normality tests, it is obtained that the data was not normally distributed. As a result of this output, nonparametric statistical tests were used. For up to two groups, Mann-Whitney U test was used to compare these groups. For three and above number of groups, Kruskal Wallis test was used. When the meaningful results were obtained, in order to find which groups, have a significant relationship, Mann-Whitney U test was used in pairs. In order to find the correlation between e-learning styles and attitudes towards e-learning, Spearman Correlation analysis was made.

The results showed that audio-visual learning style is the learning style that the participants have the most. The higher e-learning predisposition scores means the participants have positive attitudes to use e-learning. The lower e-learning predisposition scores means the participants have negative attitudes to use e-learning. On the other hand, e-learning avoidance scores were calculated with reverse matter method. The answers of the participants to e-learning avoidance items were calculated with their reverse value. The higher e-learning avoidance score means the participants have positive attitudes to e-learning. The lower e-learning avoidance score means the participants are likely to avoid e-learning.

Independent learning style has positive and meaningful correlation with e-learning predisposition and e-learning avoidance. Audio-visual learning style has positive and meaningful correlation with e-learning predisposition and e-learning avoidance. Verbal learning style has positive and meaningful correlation with e-learning predisposition. The results presented that there is a statistically significant difference between male and female participants in terms of e-learning avoidance. On the other hand, in terms of e-learning predisposition and e-learning avoidance there are statistically significant differences between grade levels. Moreover, it was obtained that there is statistically

significant difference between male and female participants in terms of independent learning, active learning, and verbal learning. As a result of the tests, statistically significant difference was found between grade levels in terms of independent learning, social learning, active learning, logical learning, audio-visual learning, verbal learning and intuitive learning.

Key words: Attitudes Towards E-Learning, E-Learning, Learning

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1. INTRODUCTION

Covid-19 pandemic is a worldwide crisis which was started in 2019 in Wuhan, China. This pandemic has been affecting the countries all around the world in different areas. Because of this highly influential outbreak, the countries felt a need to take precautions like social distancing, handwashing, wearing face masks. In some countries, citizens have experienced lockdowns for a certain time (Pokhrel & Chhetri, 2021).

According to the study of Pokhrel and Chhetri (2021), the Covid-19 pandemic affected approximately 1.6 billion learners all around the world. Both learners and teachers have experienced different types and techniques of learning through almost three years. In this time period, because of pandemic precautions schools were closed, educational institutes moved their whole system to online. Moreover, some learners and teachers got sick, and the educational practices disturbed. In the pandemic situation, schools and universities started to use e-learning tools more actively to give learners opportunities to engage learning environment (Subedi, Nayaju, Subedi, Shah and Shah, 2020).

1.1 Statement of the problem

During the Covid-19 pandemic, both learners and instructors faced a lot of problems about digital and online learning. Without the knowledge of e-learning types and attitudes towards e-learning, the learners weren't completely reached, and weren't provided learning needs. E-learning types of the learners can change from individual to individual. In the Covid-19 period, all the learners used the same type of learning materials. The researcher observed that this strategy didn't totally apply for all the users, especially for the learners who are in Management and Information Systems Department. The researcher strongly suggests that the e-learning types of the students who are in Management and Information Systems Department should be investigated, and new learning materials and strategies need to be developed according to these results.

1.2 Purpose of the study

This research aims to investigate the relationship between e-learning styles and attitudes towards e-learning of Management Information Systems students who have experienced e-learning during Covid-19 pandemic.

1.3 Research questions

In this research, there are six research questions.

- What are the e-learning styles of Management Information Systems students?
- What is the level of Management Information Systems students' attitudes towards e-learning during Covid-19 pandemic?
- Is there a relationship between Management Information Systems students' e-learning styles and attitudes towards e-learning during Covid-19 pandemic?
- Do Management Information Systems students' attitudes towards e-learning during Covid-19 pandemic change according to students' gender and grade level?
- Do Management Information Systems students' e-learning styles change according to students' gender and grade level?
- What is the level of Management Information Systems students' satisfaction about their schools' e-learning system during Covid-19 pandemic?

1.4 Hypotheses

In this study, the listed hypotheses will be tested.

- The Management Information Systems students' learning style is individual learning style.
- The Management Information Systems students' learning style is audio – visual learning style.
- The Management Information Systems students' learning style is logical learning style.
- The Management Information Systems students have positive attitudes towards e-learning.
- The participants whose learning style is individual learning style have positive attitudes towards e-learning.
- The participants whose learning style is audio - visual learning style have positive attitudes towards e-learning.
- The participants whose learning style is logical learning style have positive attitudes towards e-learning.
- The participants whose learning style is social learning style have negative attitudes towards e-learning.
- The participants whose learning style is concrete learning style have negative attitudes towards e-learning.

- The female participants have more positive attitudes towards e-learning than the male participants.
- According to the grade level of the participants, there is no statistically significant difference between their attitudes towards e-learning.

2. LITERATURE REVIEW

2.1 Learning

Learning is a concept that were discussed by a lot of researchers and psychologists. According to Alexander, Schallert and Reynolds (2009), learning was defined as a multidimensional process. At the end of this process, there can be a long-lasting change in a person and the perception of the world. On the other hand, De Houwer, Barnes-Holmes and Moors (2013) define learning that the experiences of the person can change the person's behavior or mechanically make a change in the organism. Moreover, De Houwer, Barnes-Holmes and Moors (2013) find these two definitions are insufficient and they define learning as changes in the behavior of the person that result from orderliness of the person's environment.

Yüksekdağ (2016) also mentions that the definition of the learning changes from researcher to researcher, from scientist to scientist. Despite of no agreement on the learning definitions, there are some common key words and concepts in the definitions. According to these common concepts, Yüksekdağ (2016) defines learning as permanent changes on the behavior that result from life experiences or the capacity to behave in a certain way. However, this definition also discussed by different researchers and theorists. This situation brings about different learning theories based on different interpretations on the definition. According to Ertmer and Newby (2013), there are some questions that help to differentiate learning theories from each other. These questions are about how learning occurs, which factors are affecting learning, the role of memory, how transfer occurs, what types of learning can be explained by the theory in a best way, which basic principles of this theory is about instructional design, to facilitate learning how instruction should be developed (Ertmer and Newby, 2013). The answers that are given to these questions show a definition of learning based on which learning theory (Yüksekdağ, 2016).

2.2 Learning Theories

The definition of the learning differs from learning theory to learning theory. The definitions of learning will be explained according to the different learning theories such as behaviorism, cognitivism, and constructivism.

According to behaviorism, learning occurs when a certain response is given after a specific environmental stimulus. The learner doesn't have an active role in the environment. The learning structure of the learner and the mental processes are not necessary in behaviorism (Ertmer, Newby, 2013). According to the behaviorism, the stimulus, the response, and the relationship between these two are important. The change in the behavior, the environment and the frequency and the reinforcement defines learning (Yüksekdağ, 2016).

In the 1950s, psychologist and learning professionals began to work on complex cognitive processes. These processes are thinking, problem solving and information processing (Ertmer, Newby, 2013). In cognitivism, the learner's knowledge and how the learner acquires knowledge is more important than the behavior changes (Yüksekdağ, 2016). According to cognitivism, learning occurs after a lot of mental processes that result from the learner's effort to understand the environment (Özer, 2003, as cited in Yüksekdağ, 2016).

According to constructivism, people learn the information not as it is presented to them but as they construct it (Perkins, 1999, as cited in Yüksekdağ, 2016). The learners have active role in the environment and the learning occurs when the learners build new and meaningful connection between new information and the existing ones (Yüksekdağ, 2016). Ertmer and Newby (2013) also mention that both learner and environment are crucial components of learning and the connection between them creates knowledge.

As a result, the definition of learning changes according to theories and researchers and how they look at the concepts. There isn't still a universal definition of learning but according to the perception of the world and the theories, a definition can be built.

2.3 Learning Styles

The concept of learning styles is defined by different scientists. According to Felder and Silverman (1988), learning style is learner's preferences in the process of receiving, storing, and processing information. Moreover, according to Jonassen and Grabowski (1993), learning style is general tendencies adopted in the process

of using information differently. With respect to the different explanations of learning styles, a lot of learning style models were developed.

2.4 Learning Styles Models

2.4.1 Gregorc's Learning Styles Model

According to Gregorc, every mind perceives the world concretely or abstractly and has ability to organize it linear and non-linear way. The perception ability of the learner changes from abstract to concrete, the organization ability changes from linear to non-linear (Gregoric Learning Styles, 2005). As a result of the research, Gregorc defined four learning styles.

- Concrete Sequential (CS)
- Concrete Random (CR)
- Abstract Sequential (AS)
- Abstract Random (AR)

Concrete Sequential: The learner with this learning style prefers hands-on experiences, real life examples and sequential learning. Focusing on details, producing concrete outputs from abstract ideas, step by step studying are the features of this learning style. Diagrams, flow charts, computer-aided instruction and hands-on experiments can be used for this type of learners.

Concrete Random: These learners prefer trial and error strategy. These people are the enabler of the change. They like to be in a place that is rich of stimulants. They are fast thinkers and risk takers. Computer games, multimedia can be used for these learners' learning process.

Abstract Sequential: These learners prefer a logical and analytical, highly verbal approach. They like to work alone, and they prefer well-organized materials. Before decision making, they want to gather information, analyze the ideas and search. Reading, searching on the Internet, and explaining are beneficial ways for these learners.

Abstract Random: They like to focus on relationships and emotions. Visual instructions are good for them. They can work in groups, and they like to evaluate personal experiences. They are very good at building positive relationships, listening to others and understanding emotions. Watching videos, groups discussions, case studies can be used for these people's learning process.

2.4.2 Colb's Learning Styles Inventory

According to Colb's Learning Styles Inventory, there are four styles of learners. These are accommodator, assimilator, diverger and converger (Veznedaroğlu, Özgür, 2005).

Converger: Problem solving, decision making, logical analysis of ideas and systematic planning are the important features of this style. Learning by doing is important for these learners. They need to have opportunities about applying what they learn. In the learning process, they need to see the whole first.

Diverger: In the learning process, these learners are patient, subjective. While forming the thoughts, they prioritize their own emotions and thoughts.

Assimilator: They are very good at creating conceptual models. While they are learning, they focus on abstract terms and ideas. They need the opportunity to process information.

Accomodator: Planning, making decisions and taking part in new experiences are their characteristics features. They are open-minded in the learning environment and adapt easily to changes. They like learning by doing and feeling. They need activities about exploring.

2.4.3 Felder and Silverman's **Learning Styles Model**

In this model, learning style is defined as learner's characteristic preferences of receiving, storing, and processing information (Felder, 1993). There are four dimensions in this model.

a) Sensing – Intuitive
b) Visual – Verbal
c) Active – Reflective
d) Sequential – Global

2.4.3.1 Sensing – Intuitive

This area is based on Carl Jung's Psychological Types Theory. According to this theory, people perceive the world in two ways, sensing and intuitive. These two ways can be considered as concrete and abstracts concepts (Veznedaroğlu, Özgür, 2005).

Table 1 *The Characteristics of Sensing and Intuitive Learners*

Sensing	Intuitive
• They prefer inputs that are coming from observations and sense organs.	• They prefer to produce internal data by using their prior

• They prefer concrete information. • They want connection between information and real life. • They are good at tasks that require a certain order and method. • They are careful and practical. • They can have difficulties about understanding the information that is not connecting to a real-life example.	knowledge, intuition, predictions, and imagination. • They prefer abstract information. • They are good at learning new concepts and understanding abstract materials and Mathematical formulas. • They are inpatient about finding details. • They don't like constant memorization and routine calculations.

Veznedaroğlu, Özgür (2005)

2.4.3.2 Visual – Verbal

According to Felder and Silverman (1988), the ways people receiving the information classified in three categories. These categories are visual, verbal, and kinesthetic. When visual and verbal learning styles are related to the receiving and perceiving phase of the learning process, kinesthetic learning is also about processing information.

Table 2 *The Characteristics of Visual and Verbal Learners*

Visual	Verbal
• They can remember what they see easily. They get more information from visual data than written data. • They tend to do visual coding. • They tend to use learning strategies to visualize verbal stimuli.	• They can remember written and verbal stimuli easily. They prefer discussions and verbal explanations. • They learn better by explaining something to someone. • They tend to do code information verbally.

Veznedaroğlu, Özgür (2005)

2.4.3.3 Active – Reflective

The active mental process that information is transformed into knowledge is divided into two groups. These are active experience and reflective observation. Active experience is about doing something in the outside world. On the other hand, reflective observation is about examining and manipulating information with introspection (Veznedaroğlu, Özgür, 2005).

Table 3 *The Characteristics of Active and Reflective Learners*

Active	Reflective
• They have a natural tendency to active experiences in learning process. • They prefer interaction. They learn better by discussing, doing, and trying. • They learn better where they do something physical with knowledge. • They prefer group work.	• They tend to think alone. • They want to think about the meaning of the information. • They prefer to work alone or with most one person. • They can define problems and provide several solutions.

Veznedaroğlu, Özgür (2005)

2.4.3.4 Sequential – Global

The phase of organization of the information in the brain is divided into two, sequential and global. Sequential learners use linear, small, and related steps when receiving and understanding information. Global learners receive information as a whole and see the relationship between them later (Felder, 1996).

Table 4 *The Characteristics of Active and Reflective Learners*

Sequential	Global
• They tend to learn in linear steps in which each step logically follows another step. • While solving problems, they follow linear questioning procedure.	• They tend to learn in large leaps. • While problem solving, they can suddenly find the solution but can't explain how they find it. • They can see the details that no one see. They learn better when

• They learn best when information is presented at a steady pace and complexity.	they develop connection between their prior knowledge.

Veznedaroğlu, Özgür (2005)

2.5 E-Learning

With the help of developing technology, there are some changes in the field of learning and development can be observed. With these changes, learning and development needs of the individuals are provided by different digital tools and environments.

As the definition of learning, e-learning also has several different definitions. E-learning can be described as a delivery method of information to the learners with the help of computer networks and the Internet (Welsh, Wanberg, Brown and Simmering, 2003). E-learning sometimes is defined with the words like on-line learning, web-based learning, or computer-based learning. However, the concept of e-learning can be accepted as a broader term. According to Mayer and Clark (2003), e-learning is an instruction process that occurs via computer to increase individual learning and organization performance. On the other hand, Nicholas (2003, as cited in Durdu and Onay Durdu, 2013) mentions that e-learning is a learning that is provided via web and web-based tools. According to Govindasamy (2002), e-learning can be defined as an instruction provided via all electronic media. These electronic media is listed as the Internet, audio tapes, video tapes, interactive TV, broadcasts, and CD-ROM.

The e-learning also has a market that includes corporate and academic. In this market e-learning has segments like content creators, technology vendors and service providers (Gunasekaran, McNeil and Shaul, 2002). Different sectors and education authorities recognize e-learning and using technology in training as a method for increasing performance. Moreover, Alexander (2001) strongly claims that using technology in learning can develop the quality of learning, the access to training and the cost-effectiveness of education.

According to Gunasekaran, McNeil and Shaul (2002), e-learning is more accessible, and it provides faster learning. Also, e-learning gives learners accessibility and actuality. With e-learning, learners can have the advantages of learning without any limit about time, distance, or socio-economic conditions.

During the Covid-19 pandemic, a lot of educational intuitions across the world experienced e-learning. Alqahtani and Rajkhan (2020) mentions that despite of how wonderful the technology behind the e-learning system, the learners' readiness towards e-learning has a huge impact on the e-learning experience.

2.5.1 The Advantages of E-Learning

E-learning is used in several fields like corporate, higher education etc. According to Arkorful and Abaidoo (2015), e-learning for higher institutions has some advantages and sometimes e-learning is accepted as the best method of education. E-learning has an ability to focus on learners' needs rather than the needs of the instructor or the institutions. There are some of the advantages of using e-learning are listed below (Holmes and Gardner, 2006).

1. In e-learning there is no time or place limitations. Learners can have the necessary training contents without any time and place limit.
2. With e-learning, the learners can reach huge amount of information.
3. E-learning provides opportunities to build interactions between learners via forums. It motivates learners to take active participation in the learning environment.
4. E-learning is cost effective.
5. E-learning provides a freedom for the learners to choose their own learning path. Learners can benefit from e-learning in their own pace.

According to Zhang, Macpherson, and Jones (2006), e-learning gives learner the opportunity to watch and listen to the activities several times with interactive videos. Moreover, according to Juhadil, Samah and Sarah (2007), with the usage of advanced technology in education, both instructors and learners can develop their information and communication technology skills.

2.5.2 The Disadvantages of E-Learning

Adoption of e-learning has some disadvantages. These disadvantages are listed below according to Arkorful and Abaidoo's research (2015).

1. E-learning can cause lack of interaction between learners and instructors. In order to prevent these effects, the learners need to be motivated and supported.
2. Face to face learning sometimes is a lot easier than e-learning.

3. E-learning can be insufficient about learner's communication skills and the transfer of their knowledge to others.
4. The prevention of cheating can be hard.
5. E-learning can also be a subject to plagiarism and cheating.
6. E-learning may limit the role of educators.
7. E-learning cannot be applied for all the areas of teaching. Some of the practices need to be done with hands on experiences.

2.5.3 E-Learning Styles

In order to make suitable instructional design and help learners to learn better, it is important to determine our learners' learning styles. The learning preferences and the learning styles change from learner to learner. To improve the quality of the learning, especially for the online learners, knowledge about learning styles has a huge role. Determining learning preferences and learning styles help both sides of the learning, learners, and instructors. If the learner is aware of his/her personal learning characteristics, he/she can use this knowledge on his/her own learning processes. If the instructors know their learners' characteristics, they will be able to develop and design appropriate learning materials.

Despite there are a lot of studies about learning styles of the learners in traditional learning environments, the number of studies about the learning styles of the learners in online learning environment. The demand of distance learning is increasing and determining learning styles of the learners in online learning environment become very important (Gülbahar & Alper, 2014).

Ergün and Kurnaz (2019) conducted a study with 672 voluntary students. Their aim was to investigate the relationship between academic achievement and learning styles, the participation in online classes and the rate of watching synchronous lecture records. The results show that participation in online classes, watching lecture records increase academic achievement. Moreover, the study presents that active learning and independent learning styles in e-learning environments have a huge impact on academic achievement.

Şentürk and Ciğerci's (2017) study aims that investigating e-learning styles of 213 classroom teachers according to their gender, professional seniority, educational background, prior e-learning course experience, computer software usage level. The study shows that there is a statistically significant difference between e-learning styles of the teachers according to gender difference. Moreover, as a result, classroom teachers

have predominantly audio-visual e-learning style. According to the difference between professional seniority, the study shows that the teachers with 1-5 professional experience and 21 and above years professional experience have predominantly logical e-learning style. The teachers with professional experience with 16-20 years have predominantly social e-learning style. Furthermore, the teachers with 6-10 years professional experience and 11-15 years professional experience have predominantly audio-visual e-learning style. The study presents that the teachers with prior e-learning computer software usage have logical e-learning style.

It has been observed that e-learning styles of learners in online learning environments can consist of eight dimensions. While determining these dimensions, personal characteristics, the processes of receiving and processing information, abilities, and the environments that the learner prefers to work were considered (Gülbahar & Alper, 2014).

2.5.3.1 Independent Learning

- They prefer to work alone.
- They take a long time to think about life-related topics.
- They prefer to work independently with direction.
- Independent learners take responsibility for their own learning.
- They are very confident in their ability to learn.
- They prefer to work in a group work after making preliminary preparations.

2.5.3.2 Social Learning

- They like to be in an interactive group activity.
- They give importance to the interaction between instructor and learners.
- They prefer activities and projects that require group work.
- Social learners consider learning as joint responsibility of the instructor and learner.
- They like giving instructions and helping other learners.
- They prefer to participate activities like chat, virtual classroom, and white board activities.
- They like to be in a group work and leading the group work.

2.5.3.3 Audio Learning

- They think that they learn best by hearing.
- They like to listen to music while working and travelling.

- They like to listen to the others' experiences.
- They can differentiate sounds and notice what the sound is.
- They play an instrument or like to sing.
- They don't like quiet environments.
- They prefer instructors who explain subjects briefly.

2.5.3.4 Visual Learning

- They think that they learn best by seeing.
- They have more interest in mathematics, science, and technology.
- They are good at using maps.
- They prefer documents that contains pictures and tables.
- They can easily remember visual objects and plans.
- They like art, geometry, and drawing.
- They like to take pictures and shoot videos about the environment.

2.5.3.5 Concrete Learning

- They think that they learn best by doing.
- They like activities like sports and dance.
- They like working with things like ceramics and sculptures.
- They like to touch different objects like furniture and clothes.
- They like learning by playing games and simulations.
- They enjoy solving problems that require creativity.
- They enjoy discovering and researching.

2.5.3.6 Abstract Learning

- They think that they learn best by reading.
- They enjoy making connections between their daily conversations and what they have heard and seen before.
- They like telling jokes and stories.
- They prefer to work on subjects like literature, language, and history.
- They like to discuss problems more than work on them.
- They have a huge vocabulary, and they are careful about using the right word in the right place.
- They can express themselves very well, either in writing or verbally.

2.5.3.7 Logical Learning

- They can learn best by thinking in detail.
- They like activities that include calculation.
- They enjoy playing puzzles and logic games.
- They prefer to work step by step within a plan.
- They don't like to make choices in the learning process.
- They are very realistic.
- If they understand the small parts, they can understand the whole.

2.5.3.8 Intuitive Learning

- They think that they learn best by associating with their feelings.
- They prefer random processes.
- They use their intuition when solving problems.
- They like to be offered different options and resources.
- They are very creative.
- If they understand the whole, they can also understand the small parts.

2.6 E-Learning Attitudes

E-learning has been used in various fields. The effect of e-learning on different target groups has been investigated. The attitudes towards e-learning can be change according to learners' needs and the situation that they are in. Technological barriers, socio-economic conditions, insufficient equipment, the Internet availability can directly affect learners' attitudes towards e-learning and satisfaction of the instruction.

In Dikbaş's study (2006), e-learning attitudes of teacher candidates were investigated. According to the study, e-learning has a huge impact on teacher trainings. Most of the teacher candidates think that e-learning has no place limitations and therefore they want to use e-learning applications more. The research shows that the attitudes towards e-learning of teacher candidates are positive and female teacher candidates have more positive attitudes than male teacher candidates.

Liaw, Huang and Chen (2007) conducted a study on instructors' and learners' e-learning attitudes. The research shows that instructors have positive attitudes towards e-learning. Moreover, Özgür and Tosun (2010) worked on the effect of the Internet aided instructions on e-learning attitudes. The study shows that the Internet aided instruction has positive affect on teacher candidates' e-learning attitudes.

In another study, Liaw and Huang (2011) worked on learners' attitudes and behaviors in using e-learning. They investigated the attitude difference according to

gender, computer related experiences, self-efficacy, and motivation. The study shows that male learners have more positive attitudes than female learners about using e-learning.

In Alodail's research (2016), the attitudes of instructors about e-learning usage in the classroom were investigated. The study presents that female instructors have more positive attitudes towards e-learning. On the other hand, Thakkar, and Joshi (2017) made research with university students and they found that the students who are in engineering departments have positive attitudes towards e-learning.

Korucu and Ertekin (2020) also studied on e-learning attitudes of learners who were studying on KPSS. According to the study, there is no statistically significant difference between e-learning attitudes of female and male students.

In Güven Özdemir and Sönmez's study (2021), the researchers are working with nursing students and their technology addiction level and their attitudes towards e-learning during Covid-19 pandemic. Their purpose is to establish the relationship between their attitudes towards e-learning and their levels of technology addiction. In the study, the sample included 434 nurses. The study presented that these nursing students had mildly positive attitudes towards e-learning. The researchers explained this result as the limitations of practical skills via distance learning. In this study, there are also limitations such as limited internet access and not being able to download e-learning materials. These limitations also had a huge effect on these nursing students' e-learning experiences (Güven Özdemir & Sönmez, 2021).

During the Covid-19 pandemic, Akcil and Bastas (2020) also conducted a study on university students' attitudes towards e-learning. In the study, the researchers explained that Covid-19 pandemic had a huge impact on people's lives and caused several changes in the field of education, life, and economy. The concepts such as digital learning and e-learning became parts of the people's lives. The study's purpose is to investigate the relationship between digital citizenship and e-learning. The study conducted with university students. The results showed that the e-learning attitude of these participants is positive at medium level. The researchers claimed that this result can be caused by unpreparedness for e-learning in the Covid-19 pandemic (Akcil & Bastas, 2020).

Yurdal, Sahin, Kosan and Toraman (2020) conducted a study to establish the relationship between students' attitudes towards e-learning and their e-learning styles. In order to determine students' attitudes towards e-learning, the researchers developed

a scale. This study was held with 815 students who are from Canakkale Onsekiz Mart University Faculty of Medicine. The study showed that the students' attitudes towards e-learning was changing between positive and negative. In addition to that, the students had negative attitudes towards online medical education (Yurdal, Sahin, Kosan & Toraman, 2020).

3. METHODOLOGY

This research aims to investigate the relationship between e-learning styles and attitudes towards e-learning of Management Information Systems students who have experienced e-learning during Covid-19 pandemic. In this section, the population, the data collection instruments, the design of the study and procedures will be explained.

3.1 Participants

The participants of this study are the students in Management Information Systems Department of Yeditepe University who experienced e-learning during Covid-19 pandemic. The population includes Management Information Systems students who are first graders, second graders, third graders, fourth graders. Moreover, graduate students in Management Information Systems Master Program also are in the population of this study.

The instruments were presented via online survey tool, Google Forms. The number of participants who completed the survey voluntarily is 120. However, 3 of the participants indicated that they are studying in the Department of Information Systems and Technologies. 3 of the participants indicated in the online survey that they are studying in the Department of Computer Science and Engineering. By reason of the target population of this study includes only Management Information Systems students, the answers of these 6 participants were removed.

Table 5 *Gender Distribution of the Participants*

Gender	n	%
Female	66	58%
Male	48	42%
Total	114	100%

The participant of this study consists of 66 females and 48 males (See Table 5). The percentage of females in this study is 58%, the percentage of males in this study 42%.

Table 6 *Grade Distribution of the Participants*

Grade Level	n	%
First Year / Freshman Year	6	5%
Second Year / Sophomore Year	24	21%
Third Year / Junior Year	30	26%
Fourth Year / Senior Year	12	11%
Graduate	42	12%

The participants of this study include 6 first year students, 24 second year students, 30 third year students, 12 fourth year students and 14 graduate students. The percentage of first year students in this study is 5%, the percentage of second year students in this study is 21%, the percentage of third year students in this study is 26%, the percentage of fourth year students in this study is 11%, the percentage of graduate students in this study is 12% (See Table 6).

Table 7 *Age Distribution of the Participants*

Age	n	%
18-20	6	5%
21-23	66	58%
24-26	12	11%
27 and above	30	26%

The participants of this study consist of 6 people with the age 18-20, 66 people with the age 21-23, 12 people with the age 24-26, 30 people with the age 27 and above (See Table 7). The percentage of the people with the age 18-20 is 5%, the percentage of the people with the age 21-23 is 58%, the percentage of the people with the age 24-26 is 11% and the percentage of the people with the age 27 and above is 26%.

3.2 Instruments

In this study, Gülbahar and Alper's (2014) E-Learning Styles Scale for Electronic Environments and Haznedar and Baran's (2012) General Attitudes Towards E-

Learning instrument are used. Moreover, to gather demographic and personal additional questions are presented. In order to gather data about participants' Covid-19 pandemic experiences, 6 additional items are presented. The questions about demographic and personal information, two instruments and 6 additional Covid-19 pandemic questions are prepared in online survey and presented to participants online.

In the first section of the survey form, participants' e-mail, gender, department, grade, and age information are taken.

3.2.1 E-Learning Styles Scale for Electronic Environments

Gülbahar and Alper (2014) mention that to help students learn better and develop appropriate instructional design for them, determining their learning styles is very critical. To determine learners' e-learning styles for electronic environments, Gülbahar and Alper (2014) developed an instrument that is called "E-Learning Styles Scale for Electronic Environments". The universe of their study consists of 3437 students who are registered in distance learning program. The sample of this study consists of 2722 students who are using distance learning system actively. First, to develop the instrument, 161 students were asked 4 open-ended questions. With the qualitative analysis of their answers and literature reviews, the researchers ended up with the idea that e-learning styles scale for electronic environments should have 8 dimensions (Gülbahar & Alper, 2011). The scale was developed as 5-point Likert scale and has 38 items. The reliability value of the scale was found as Cronbach α 0.94. According to the seven factors of this scale, the reliability coefficients change between 0.72 and 0.87. The reliability coefficients of the seven dimensions are listed in Table 5. As a result of validity analyses, the scale consisted of seven factors. One of the important findings of this research is visual and audio learning styles are combined as a single factor. Concrete learning style was changed as active learning style and abstract learning style was changed as verbal learning style (Gülbahar & Alper, 2014).

Table 8 *The Reliability Coefficient of The Seven Dimensions*

Factors	**Number of Items**	**Reliability Coefficient (α)**
Independent Learning	4	0.82
Social Learning	6	0.87
Audio - Visual Learning	8	0.86
Active Learning	6	0.83

Verbal Learning	7	0.86
Logical Learning	3	0.77
Intuitive Learning	4	0.72

3.2.2 General Attitude Scale Towards E-Learning

Haznedar and Baran (2012) conducted a study to develop a general attitude scale towards e-learning. Their aim was to determine students' attitudes towards e-learning in the Faculty of Education. 567 students who were in the Faculty of Education participated this study. With respect to literature reviews, 50 attitude items were written for the first draft. After the factor analyses, the scale was developed as 20 attitude item scale. The scale has two factors. These two factors were determined as differentiating between positive attitude items and negative attitude items. The first factor was names as e-learning susceptibility and the second factor was names as escapism from e-learning. The lowest score that participants can take from this scale is calculated as 20 points. The highest score that participants can take from this scale is calculated as 100 points. The reliability coefficient, Cronbach α was calculated as 0.93. The Cronbach α coefficient is between 0.7 and 1, therefore this scale is reliable (Büyüköztürk, 2002). Haznedar and Baran (2012) developed this scale with the students who were in the Faculty of Education, but the researchers recommend that using this scale with different samples for different purposes will make significant contributions to the field of e-learning.

3.3 Design of The Research

In this study, quantitative correlational research design model is used. According to Gay and Mills (2011), correlational research design is collecting and gathering data to state the relationship between two or more variables. The relationship degree between variables is explained as a correlation coefficient. The aims of the correlational research are establishing relationship between two variables and using this relationship to make predictions (Gay & Mills, 2011, p.204). Variables that are used in correlational studies can be scored. Sample size must be over 30 participants. The result of the study gives the researcher the opportunity to define if and to what degree the variables are related to each other. The correlation between two variables is obtained by a correlation coefficient. This coefficient can take values from -1.00 to +1.00. The correlation coefficient shows the size and the direction of the relationship between two variables.

The result doesn't determine a causal relationship (Gay & Mills, 2011, p.204). In correlational research design, the scores of the variables are determined from all the participants and the pairs are correlated (Gay & Mills, 2011, p.205).

3.4 Procedure of The Research

In this study, the instruments were presented online to the participants. Then, according to their responses to the items, the scores of the participants were calculated. After the calculations, appropriate statistical tests were applied to obtain correlational coefficient.

3.5 Data Analysis

In order to analyze the data that was gathered, in this study IBM SPSS Statistics 26 software was used. To test research questions, several statistical tests were conducted on IBM SPSS Statistics 26.

4. RESULTS

In this section, the test results of the research questions are provided. Under each research question, the results are presented.

4.1 E-Learning Styles of Management Information Systems Students

Research question: What are the e-learning styles of Management Information Systems students?

Table 9 *Descriptive Statistics of E-Learning Styles of Management Information Systems Students*

E-Learning Style	n	Mean	Standard Deviation
Independent Learning	114	15.53	3.678
Social Learning	114	19.89	4.898
Audio - Visual Learning	114	32.37	5.175
Active Learning	114	22.11	3.376
Verbal Learning	114	23.37	4.214
Logical Learning	114	9.58	3.376
Intuitive Learning	114	13.89	3.090

When the results of the e-learning styles of Management Information Systems students are examined, the mean score obtained from Independent Learning sub dimension is 15.53 points.

The mean score obtained from Social Learning sub dimension is 19.89 points, the mean score obtained from Audio - Visual Learning sub dimension is 32.37 points, the mean score obtained from Active Learning sub dimension is 22.11 points, the mean score obtained from Verbal Learning sub dimension is 23.37 points, the mean score obtained from Logical Learning sub dimension is 9.58 points, and the mean score obtained from Intuitive Learning sub dimension is 13.89 points.

4.2 The Level of Management Information Systems Students' Attitudes Towards E-Learning During Covid-19 Pandemic

Research question: What is the level of Management Information Systems students' attitudes towards e-learning during Covid-19 pandemic?

The instrument that Haznedar and Baran (2012) developed has two factors. One of the factors is e-learning predisposition and the other factor is avoiding e-learning.

Table 10 *The level of Management Information Systems Students' Attitudes Towards E-Learning During Covid-19 Pandemic*

Factors of Attitudes Towards E-Learning	n	Mean	Standard Deviation
Factor 1: E-Learning Predisposition	114	26.79	12.737
Factor 2: E-Learning Avoidance	114	27.16	11.435

The results show that mean of the e-learning predisposition is 26.79 and the mean of the e-learning avoidance is 27.16 (See Table 10). E-learning predisposition scores were calculated according to the answers of the participants. The participants gave answers from 1 to 5 points. The points were summed and presented as e-learning predisposition scores. The higher e-learning predisposition scores means the participants are positive to use e-learning. The lower e-learning predisposition scores means the participants are negative to use e-learning. On the other hand, e-learning avoidance scores were calculated with reverse matter method. The answers of the participants to e-learning avoidance items were calculated with their reverse value. The higher e-learning avoidance score means the participants are positive to e-learning. The lower e-learning avoidance score means the participants are likely to avoid e-learning.

4.3 Relationship Between Management Information Systems Students' E-Learning Styles and Attitudes Towards E-Learning During Covid-19 Pandemic

Research question: Is there a relationship between Management Information Systems students' e-learning styles and attitudes towards e-learning during Covid-19 pandemic?
In order to analyze the relationship between e-learning styles and attitudes towards e-learning of Management Information Systems students', the normality of the data was checked.

Table 11 *Kolmogorov-Smirnov Results of E-Learning Styles Sub Dimensions*

E-Learning Style	Statistic	df	Significance
Independent Learning	.183	114	<.001
Social Learning	.168	114	<.001
Audio - Visual Learning	.130	114	<.001
Active Learning	.085	114	.043
Verbal Learning	.155	114	<.001
Logical Learning	.094	114	.014
Intuitive Learning	.118	114	<.001
E-Learning Predisposition	.906	114	<.001
E-Learning Avoidance	.921	114	<.001

According to Kolmogorov-Smirnov results, the significance values of independent learning, social learning, audio-visual learning, active learning, verbal learning, logical learning, intuitive learning, e-learning predisposition, and e-learning avoidance aren't normally distributed ($p < .05$).
In order to analyze the correlation between the e-learning styles and attitudes towards e-learning, one of the nonparametric test Spearman Correlation was used.

Table 12 *The Result of Spearman Correlation Test Based on The Relationship Between Students' E-Learning Styles and Attitudes Towards E-Learning*

E-Learning Styles	Attitudes Towards E-Learning	N	r	p
Independent Learning	E-Learning Predisposition	114	.552**	<.001
	E-Learning Avoidance	114	.559**	<.001
Social Learning	E-Learning Predisposition	114	-.056	.551
	E-Learning Avoidance	114	-.012	.896
Active Learning	E-Learning Predisposition	114	.129	.173
	E-Learning Avoidance	114	.091	.334
Logical Learning	E-Learning Predisposition	114	.085	.368
	E-Learning Avoidance	114	-.021	.823
Audio-Visual Learning	E-Learning Predisposition	114	.284**	.002
	E-Learning Avoidance	114	.212*	.024
Verbal Learning	E-Learning Predisposition	114	.257**	.006
	E-Learning Avoidance	114	.177	.059
Intuitive Learning	E-Learning Predisposition	114	.135	.152
	E-Learning Avoidance	114	-.063	.505

According to the results of Spearman Correlation Test, there is a positive and meaningful correlation between independent learning and e-learning predisposition

(r=.552, p<.05). There is also a positive and meaningful correlation between independent learning and e-learning avoidance (r=.559, p<.05).

Between audio-visual learning and e-learning predisposition, there is a positive and meaningful correlation (r=.284, p=.002). Between audio-visual learning and e-learning avoidance, there is a positive and meaningful correlation (r=.212, p=.024). There is a positive and meaningful correlation between verbal learning and e-learning predisposition (r=.257, p=.006).

In accordance with the result, there is no correlation between social learning style and e-learning predisposition and e-learning avoidance (p>.05). Moreover, no correlation was found between active learning style and e-learning predisposition and e-learning avoidance (p>.05). There is no correlation between logical learning style and e-learning predisposition and e-learning avoidance (p>.05). There is no correlation between verbal learning style and e-learning avoidance. Finally, there is no correlation between intuitive learning style and e-learning predisposition and e-learning avoidance (p>.05).

4.4 Management Information Systems Students' Attitudes Towards E-Learning During Covid-19 Pandemic Change According to Students' Gender and Grade Level

Research question: Do Management Information Systems students' attitudes towards e-learning during Covid-19 pandemic change according to students' gender and grade level?

In order to analyze the change of attitudes towards e-learning of Management Information Systems students' according to the students' gender and grade, the normality of the data was checked.

Table 13 *Kolmogorov-Smirnov Results of E-Learning Predisposition and E-Learning Avoidance*

Attitudes Towards E-Learning	Statistic	df	Significance
E-Learning Predisposition	.147	114	<.001
E-Learning Avoidance	.149	114	<.001

The result of Kolmogorov-Smirnov test on e-learning predisposition and e-learning avoidance scores showed that these two scores are not normally distributed (p<.05).

As a result of this test, for the further analysis nonparametric tests must be used. To analyze the change in terms of gender in e-learning predisposition and e-learning avoidance Mann-Whitney U test was used.

Table 14 *Mann-Whitney U Results of The Attitudes Towards E-Learning and Gender*

Attitudes Towards E-Learning	Gender	N	Mean Rank	Sum of Rank	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
E-Learning Predisposition	Male	48	63.88	3066.0	1278.0	-1.760	.078
	Female	66	52.86	3489.0			
	Total	114					
E-Learning Avoidance	Male	48	70.25	3372.0	972.0	-3.528	<.001
	Female	66	48.23	3183.0			
	Total	114					

The result of Mann-Whitney U Test shows that there is a statistically significant difference between male and female participants' e-learning avoidance scores ($p<.05$). On the other hand, according to the results of the test e-learning predisposition doesn't change according to the gender ($p>.05$)

To be able to analyze the change in e-learning predisposition and e-learning avoidance in terms of grades, the result of Kruskal-Wallis Test must be examined.

Table 15 *Kruskal Wallis Results of The Attitudes Towards E-Learning and Grade Levels*

Attitudes Towards E-Learning	Grade Level	N	Mean Rank	Kruskal Wallis H	df	Asymp. Sig.
E-Learning Predisposition	First Year	6	39.50	21.452	4	<.001
	Second Year	24	47.0			
	Third Year	30	71.30			

	Fourth Year	12	27.50			
	Graduate	42	64.79			
	Total	114				
E-Learning Avoidance	First Year	6	9.50	41.296	4	<.001
	Second Year	24	43.25			
	Third Year	30	71.30			
	Fourth Year	12	26.00			
	Graduate	42	71.64			
	Total	114				

According to the Kruskal Wallis Test results, the statistically significant difference is seen in terms of grade levels in e-learning predisposition scores and e-learning avoidance scores ($p<.05$).

In order to identify the statistically significant difference in terms of grade levels in attitudes towards e-learning further tests were applied between groups. According to Akbulut (2010, p.185), when a statistically significant difference is seen as a result of Kruskal Wallis test, to identify which groups have this statistically significant difference between them, Mann-Whitney U test must be conducted. For e-learning predisposition and e-learning avoidance, the grade level groups were compared and tested. As a result of the nonnormally distribution of e-learning predisposition scores and e-learning avoidance scores, one of the non-parametric tests which is Mann-Whitney U test was applied.

Table 16 *Mann-Whitney U Test Results of E-Learning Predisposition According to the Grade Levels*

Attitudes Towards E-Learning	Grade Level	N	Mean Rank	Sum of Rank	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)

E-Learning Predisposition	First Year	6	15.50	93.0	72.0	.000	1.00
	Second Year	24	15.50	372.0			
	Total	30					
E-Learning Predisposition	First Year	6	9.50	57.0	36.00	-2.324	.020
	Third Year	30	20.30	609.0			
	Total	36					
E-Learning Predisposition	First Year	6	15.50	93.0	.000	-3.571	<.001
	Fourth Year	12	6.50	78.0			
	Total	18					
E-Learning Predisposition	First Year	6	9.50	57.0	36.0	-2.827	.005
	Graduate	42	26.64	1119.0			
	Total	48					
E-Learning Predisposition	Second Year	24	22.25	534.0	234.0	-2.216	.027
	Third Year	30	31.70	951.0			
	Total	54					
E-Learning Predisposition	Second Year	24	20.00	480.0	108.0	-1.225	.221
	Fourth Year	12	15.50	186.0			
	Total	36					
E-Learning Predisposition	Second Year	24	26.75	642.0	342.0	-2.173	.030
	Graduate	42	37.36	1569.0			
	Total	66					
E-Learning Predisposition	Third Year	30	25.10	753.0	72.0	-3.037	.002
	Fourth Year	12	12.50	150.0			
	Total	42					
E-Learning Predisposition	Third Year	30	40.70	1221.0	504.0	-1.444	.149
	Graduate	42	33.50	1407.0			
	Total	72					
E-Learning Predisposition	Fourth Year	12	12.50	150.0	72.0	-3.768	<.001
	Graduate	42	31.79	1335.0			
	Total	54					

According to the test results, in terms of e-learning predisposition there is a statistically significant difference between first year students and third year students (See Table 16). Third year students have statistically higher e-learning predisposition than first year students in this study (U=36, p<.05). Between first year students and fourth year students, there is also a statistically significant difference. First year students have more e-learning predisposition than fourth year students (U=0, p<.05). A statistically significant difference is determined between first year students and graduate year students. Graduate year students have more e-learning predisposition than first year students (U=36, p<.05). In terms of e-learning predisposition, there is also a statistically significant difference between second year students and third year students. Third year students have more e-learning predisposition than second year students in this study (U=234, p<.05). Moreover, between second year students and graduate year students, there is a statistically significant difference in terms of e-learning predisposition. Graduate year students have statistically higher e-learning predisposition than second year students (U=342, p<.05). There is also a difference between third year students and fourth year students in terms of e-learning predisposition. Third year students have more e-learning predisposition than fourth year students (U=72, p<.05). Furthermore, there is also a statistically significant difference between fourth year students and graduate year students. Graduate year students have higher e-learning predisposition than fourth year students in this study (U=72, p<.05).

On the other hand, the test results showed that there is no statistically significant difference between first year students and second year students, second year students and fourth year students and third year students and graduate year students in terms of e-learning predisposition (p>.05).

Table 17 *Mann-Whitney U Test Results of E-Learning Avoidance According to the Grade Levels*

Attitudes Towards E-Learning	Grade Level	N	Mean Rank	Sum of Rank	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
E-Learning Avoidance	First Year	6	3.50	21.0	.000	-3.907	<.001
	Second Year	24	18.50	444.0			

	Total	30					
E-Learning Avoidance	First Year	6	3.50	21.0			
	Third Year	30	21.50	645.0	.000	-3.873	<.001
	Total	36					
E-Learning Avoidance	First Year	6	9.50	57.0			
	Fourth Year	12	9.50	114.0	36.0	.000	1.00
	Total	18					
E-Learning Avoidance	First Year	6	3.50	21.0			
	Graduate	42	27.50	1155.0	.000	-3.958	<.001
	Total	48					
E-Learning Avoidance	Second Year	24	19.25	462.0			
	Third Year	30	34.10	1023.0	162.0	-2.497	<.001
	Total	54					
E-Learning Avoidance	Second Year	24	20.00	480.0			
	Fourth Year	12	15.50	186.0	108.0	-1.243	.214
	Total	36					
E-Learning Avoidance	Second Year	24	23.0	552.0			
	Graduate	42	39.50	1659.0	252.0	-3.404	<.001
	Total	66					
E-Learning Avoidance	Third Year	30	25.70	771.0			
	Fourth Year	12	11.0	132.0	54.0	-3.576	<.001
	Total	42					
E-Learning Avoidance	Third Year	30	36.50	1095.0			
	Graduate	42	36.50	1533.0	630.0	.000	1.00
	Total	72					
E-Learning Avoidance	Fourth Year	12	9.50	114.0			
	Graduate	42	32.64	1371.0	36.0	-4.521	<.001
	Total	54					

In accordance with the results, in terms of e-learning avoidance statistically significant differences were found between first year students and second year students, first year students and third year students, first year students and graduate year students.

Moreover, there are significant differences between second year students and third year students, second year students and graduate year students, third year students and fourth year students, fourth year students and graduate year students.

According to the results, second year students have more e-learning avoidance than first year students (U=0, p<.05). Third year students have higher e-learning avoidance than first year students (U=0, p<.05). Graduate year students have more e-learning avoidance than first year students (U=0, p<.05). On the other hand, third year students have more e-learning avoidance than second year students (U=162, p<.05). Graduate year students have higher e-learning avoidance than second year students (U=252, p<.05). Third year students have statistically higher e-learning avoidance than fourth year students in this study (U=54, p<.05). Finally, graduate year students have more e-learning avoidance than fourth year students (U=36, p<.05).

The results showed that there is no statistically significant difference between first year students and fourth year students, second year students and fourth year students and third year students and graduate year students in terms of e-learning avoidance (p>.05).

4.5 Management Information Systems Students' E-Learning Styles and The Change According to Students' Gender and Grade Level

Research question: Do Management Information Systems students' e-learning styles according to students' gender and grade level?

In order to analyze the change of e-learning styles of Management Information Systems students' according to the students' gender and grade, the normality of the data was checked.

Table 18 *Kolmogorov-Smirnov Results of E-Learning Styles Sub Dimensions*

E-Learning Style	Statistic	df	Significance
Independent Learning	.183	114	<.001
Social Learning	.168	114	<.001
Audio - Visual Learning	.130	114	<.001
Active Learning	.085	114	.043
Verbal Learning	.155	114	<.001
Logical Learning	.094	114	.014
Intuitive Learning	.118	114	<.001

According to Kolmogorov-Smirnov results, the significance values of independent learning, social learning, audio-visual learning, active learning, verbal learning, logical learning and intuitive learning don't have normal distribution ($p < .05$).

To be able to check the change of e-learning styles of Management Information Systems students' according to the students' gender, Mann-Whitney U test was used. Mann-Whitney U test is one of the non-parametric tests. Because of the scores of learning styles sub dimensions don't have normal distribution, non-parametric tests must be used.

Table 19 *Mann-Whitney U Results of E-Learning Styles and Gender*

E-Learning Styles	Gender	N	Mean Rank	Sum of Rank	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Independent Learning	Male	48	69.50	3336.0	1008.0	-3338	<.001
	Female	66	48.77	3219.0			
	Total	114					
Social Learning	Male	48	53.38	2562.0	1386.0	-1144	.253
	Female	66	60.50	3993.0			
	Total	114					
Active Learning	Male	48	49.25	2364.0	1188.0	-2282	.023
	Female	66	63.50	4191.0			
	Total	114					
Logical Learning	Male	48	51.13	2454.0	1278.0	-1766	.077
	Female	66	62.14	4101.0			
	Total	114					
Audio-Visual Learning	Male	48	57.13	2742.0	1566.0	-.104	.917
	Female	66	57.77	3813.0			
	Total	114					
Verbal Learning	Male	48	49.25	2364.0	1188.0	-2301	.021
	Female	66	63.50	4191.0			
	Total	114					
	Male	48	59.38	2850.0	1494.0	-.522	.601

Intuitive Learning	Female	66	56.14	3705.0
	Total	114		

According to the results of Mann-Whitney U test (See Table 19), there is a statistically significant difference between male and female participants that have independent learning styles (U= 1008, p< .05). Male participants have independent learning style more than female participants in this study. Moreover, the results shows that there is a statistically significant difference between male and female participants who have active learning styles (p< .05). According to the result of the test, female participants have more active learning style than male participants in this study. Furthermore, according to the results of Mann-Whitney U test, there is a statistically significant difference between male and female participants who have verbal learning styles (p< .05). In accordance with the test results, female participants have more verbal learning style than male participants in this study. On the other hand, the results presents that there is no statistically significant difference between male and female participants that have social learning style, logical learning style, audio-visual learning style and intuitive learning style (p> .05).

In order to analyze the statistically significant difference between grade levels of the participants according to e-learning styles, Kruskal Wallis test was implemented. Kruskal Wallis test is one of the nonparametric tests to show difference between more than two groups.

Table 20 *Kruskal Wallis Results of E-Learning Styles and Grade Levels*

E-Learning Styles	Grade Level	N	Mean Rank	Kruskal Wallis H	df	Asymp. Sig.
Independent Learning	First Year	6	21.50	41.066	4	<.001
	Second Year	24	71.0			
	Third Year	30	82.10			
	Fourth Year	12	36.50			
	Graduate	42	43.36			

	Total	114				
Social Learning	First Year	6	72.50	31.045	4	<.001
	Second Year	24	62.00			
	Third Year	30	29.30			
	Fourth Year	12	69.50			
	Graduate	42	69.50			
	Total	114				
Active Learning	First Year	6	99.50	23.481	4	<.001
	Second Year	24	74.00			
	Third Year	30	57.50			
	Fourth Year	12	51.50			
	Graduate	42	43.79			
	Total	114				
Logical Learning	First Year	6	108.50	48.608	4	<.001
	Second Year	24	55.25			
	Third Year	30	53.90			
	Fourth Year	12	Jun.50			
	Graduate	42	68.64			
	Total	114				
Audio-Visual Learning	First Year	6	111.50	25.144	4	<.001
	Second Year	24	48.50			
	Third Year	30	43.70			

	Fourth Year	12	59.00			
	Graduate	42	64.36			
	Total	114				
Verbal Learning	First Year	6	111.50	32.430	4	<.001
	Second Year	24	68.00			
	Third Year	30	38.90			
	Fourth Year	12	41.00			
	Graduate	42	61.79			
	Total	114				
Intuitive Learning	First Year	6	99.50	47.595	4	<.001
	Second Year	24	84.50			
	Third Year	30	63.50			
	Fourth Year	12	35.00			
	Graduate	42	38.21			
	Total	114				

According to the Kruskal Wallis Test results, the statistically significant difference is seen in terms of grade levels in the independent learning, social learning, audio-visual learning, active learning, verbal learning, logical learning, intuitive learning sub dimensions ($p<.05$). In order to identify the statistically significant difference in terms of grade levels in e-learning styles further tests were applied between groups. For every e-learning style, the grade level groups were compared and tested. As a result of the nonnormally distribution of the e-learning styles, one of the non-parametric tests which is Mann-Whitney U test was applied.

Table 21 *Mann-Whitney U Test Results of Independent Learning Sub-Dimension According to the Grade Levels*

E-Learning Styles	Grade Level	N	Mean Rank	Sum of Rank	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Independent Learning	First Year	6	3.50	21.0	.00	-3.907	<.001
	Second Year	24	18.50	444.0			
	Total	30					
Independent Learning	First Year	6	3.50	21.0	.00	-4.115	<.001
	Third Year	30	21.50	645.0			
	Total	36					
Independent Learning	First Year	6	9.50	57.0	36.00	.00	1.00
	Fourth Year	12	9.50	114.0			
	Total	18					
Independent Learning	First Year	6	15.50	93.0	72.0	-1.707	.088
	Graduate	42	25.79	1083.0			
	Total	48					
Independent Learning	Second Year	24	23.75	570.0	270.0	-1.639	.101
	Third Year	30	30.50	915.0			
	Total	54					
Independent Learning	Second Year	24	20.75	498.0	90.0	-1.892	.058
	Fourth Year	12	14.0	168.0			
	Total	36					
Independent Learning	Second Year	24	45.50	1092.0	216.0	-3.872	<.001
	Graduate	42	26.64	1119.0			
	Total	66					
Independent Learning	Third Year	30	25.70	771.0	54.0	-3.713	<.001
	Fourth Year	12	11.0	132.0			

	Total	42					
Independent Learning	Third Year	30	50.90	1572.0			
	Graduate	42	26.21	1101.0	198.0	-5.049	<.001
	Total	72					
Independent Learning	Fourth Year	12	21.50	258.0			
	Graduate	42	29.21	1227.0	180.0	-1.513	.130
	Total	54					

As in the Table 21, the result showed that for independent learning style, there is a statistically significant difference between first year and second year students (U=0, p<.05). Second year students have statistically higher level of independent learning than first year students. The comparison of first year students and third year students showed that there is a statistically significant difference between first year students and third year students in terms of independent learning (U=0, p<.05). Third year students have statistically higher independent learning style than first year students. The test also showed that there is a statistically significant difference between second year students and graduate year students (U=216, p<.05). Second year students have higher independent learning style than graduate year students. There is also statistically significant difference between third year students and fourth year students. Third year students have higher independent learning styles than fourth year students (U=54, p<.05). According to the result of the test, it is seen that there is a difference between third year students and graduate year students in terms of independent learning (U=198, p<.05). Third year students have statistically higher independent learning than graduate year students. In accordance with the test results, there is no statistically significant difference between first year students and third year students, first year students and graduate year students, second year students and third year students, second year students and fourth year students, fourth year students and graduate year students (p>.05).

Table 22 *Mann-Whitney U Test Results of Social Learning Sub-Dimension According to the Grade Levels*

E-Learning Styles	Grade Level	N	Mean Rank	Sum of Rank	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Social Learning	First Year	6	18.50	111.0	54.0	-.977	.329
	Second Year	24	14.75	354.0			
	Total	30					
Social Learning	First Year	6	30.50	183.0	18.00	-3.144	.002
	Third Year	30	16.10	483.0			
	Total	36					
Social Learning	First Year	6	9.50	57.0	36.00	.000	1.00
	Fourth Year	12	9.50	114.0			
	Total	18					
Social Learning	First Year	6	24.50	147.0	126.0	.000	1.00
	Graduate	42	24.50	1029.0			
	Total	48					
Social Learning	Second Year	24	35.75	858.0	162.0	-3.482	<.001
	Third Year	30	20.90	627.0			
	Total	54					
Social Learning	Second Year	24	17.0	408.0	108.0	-1.225	.221
	Fourth Year	12	21.50	258.0			
	Total	36					
Social Learning	Second Year	24	32.0	768.0	468.0	-.485	.628
	Graduate	42	34.36	1443.0			
	Total	66					
Social Learning	Third Year	30	17.90	537.0	72.0	-3.037	.002
	Fourth Year	12	30.50	366.0			
	Total	42					
Social Learning	Third Year	30	20.90	627.0	162.0	-5.383	<.001
	Graduate	42	47.64	2001.0			

	Total	72					
Social Learning	Fourth Year	12	27.50	330.0	252.0	.000	1.00
	Graduate	42	27.50	1155.0			
	Total	54					

According to the test results, the data showed that there is a statistically significant difference between first year students and third year students in terms of social learning style ($p<.05$). First year students have statistically higher social learning style than third year students in this study ($U=54$, $p<.05$). Also, the data presented that there is a statistically significant difference between second year students and third year students in terms of social learning style ($p<.05$). Second year students have more social learning style than third year students in this study ($U=162$, $p<.05$). In accordance with the results, there is a statistically significant difference between third year students and fourth year students ($p<.05$). Fourth year students have statistically higher social learning styles than third year students ($U=72$, $p<.05$). There is also statistically significant difference between third year students and graduate year students in this study ($p<.05$). Graduate year students have statistically higher social learning style than third year students in this study ($U=252$, $p<.05$). On the other hand, the test results presented that there is no statistically significant difference between first year students and second year students, first year students and fourth year students, first year students and graduate year students, second year students and fourth year students, second year students and graduate year students and fourth year students and graduate year students ($p>.05$).

Table 23 *Mann-Whitney U Test Results of Active Learning Sub-Dimension According to the Grade Levels*

E-Learning Styles	Grade Level	N	Mean Rank	Sum of Rank	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Active Learning	First Year	6	21.50	129.0	36.0	-1.904	.057
	Second Year	24	14.0	336.0			
	Total	30					

Active Learning	First Year	6	27.50	165.0	36.0	-2.324	.020
	Third Year	30	16.70	501.0			
	Total	36					
Active Learning	First Year	6	15.50	93.0	.000	-3.571	<.001
	Fourth Year	12	6.50	78.0			
	Total	18					
Active Learning	First Year	6	45.50	273.0	.000	-3.982	<.001
	Graduate	42	21.50	903.0			
	Total	48					
Active Learning	Second Year	24	32.0	768.0	252.0	-1.891	.059
	Third Year	30	23.90	717.0			
	Total	54					
Active Learning	Second Year	24	21.50	516.0	72.0	-2.449	.014
	Fourth Year	12	12.50	150.0			
	Total	36					
Active Learning	Second Year	24	44.0	1056.0	252.0	-3.396	<.001
	Graduate	42	27.50	1155.0			
	Total	66					
Active Learning	Third Year	30	22.10	663.0	162.0	-.511	.609
	Fourth Year	12	20.0	240.0			
	Total	42					
Active Learning	Third Year	30	41.30	1239.0	486.0	-1.656	.098
	Graduate	42	33.07	1389.0			
	Total	72					
Active Learning	Fourth Year	12	32.0	384.0	198.0	-1.140	.254
	Graduate	42	26.21	1101.0			
	Total	54					

According to the results, there is a statistically significant difference between first year students and third year students in terms of active learning style. First year students have statistically higher active learning styles than third year students ($U=36$, $p<.05$).

Moreover, between first year students and fourth year students there is a statistically significant difference. First year students have higher active learning style than fourth year students in this study (U=0, p<.05). There is also statistically significant difference between first year students and graduate year students in this study. First year students have more active learning style than graduate year students (U=0, p<.05). In accordance with the results, there is a statistically significant difference between second year students and fourth year students. Second year students have higher active learning styles than fourth year students in this study (U=72, p<.05). The results showed that second year students and graduate year students are different in terms of active learning. Second year students have higher active learning style than graduate year students (U=252, p<.05).

On the other hand, the results showed that there is no statistically significant difference between first year students and second year students, second year students and third year students, third year students and fourth year students, third year students and graduate year students and fourth year students and graduate year students in this study (p>.05).

Table 24 *Mann-Whitney U Test Results of Logical Learning Sub-Dimension According to the Grade Levels*

E-Learning Styles	Grade Level	N	Mean Rank	Sum of Rank	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Logical Learning	First Year	6	27.50	165.0	.000	-3.808	<.001
	Second Year	24	12.50	300.0			
	Total	30					
Logical Learning	First Year	6	30.50	183.0	18.0	-3.191	.001
	Third Year	30	16.10	483.0			
	Total	36					
Logical Learning	First Year	6	15.50	93.0	.000	-4.123	<.001
	Fourth Year	12	6.50	78.0			
	Total	18					
	First Year	6	45.50	273.0	.000	-3.982	<.001

Logical Learning	Graduate	42	21.50	903.0			
	Total	48					
Logical Learning	Second Year	24	26.0	624.0	324.0	-.633	.527
	Third Year	30	28.70	861.0			
	Total	54					
Logical Learning	Second Year	24	24.50	588.0	.000	-4.971	<.001
	Fourth Year	12	6.50	78.0			
	Total	36					
Logical Learning	Second Year	24	29.75	714.0	414.0	-1.210	.226
	Graduate	42	35.64	1497.0			
	Total	66					
Logical Learning	Third Year	30	27.50	825.0	.000	-5.155	<.001
	Fourth Year	12	6.50	78.0			
	Total	42					
Logical Learning	Third Year	30	28.10	843.0	378.0	-2.919	.004
	Graduate	42	42.50	1785.0			
	Total	72					
Logical Learning	Fourth Year	12	6.50	78.0	.000	-5.319	<.001
	Graduate	42	33.50	1407.0			
	Total	54					

In accordance with the results, there is a statistically significant difference between first year students and second year students in terms of logical learning. First year students have higher logical learning style than second year students ($U=0$, $p<.05$). Furthermore, a statistically significant difference is seen between first year students and third year students in terms of logical learning. First year students have more logical learning style than third year students in this study ($U=18$, $p<.05$). Between first year students and fourth year students, there is also a statistically significant difference. First year students have higher logical learning style than fourth year students ($U=0$, $p<.05$). There is a statistically significant difference between first year students and graduate year students. First year students have statistically higher logical learning styles than graduate year students ($U=0$, $p<.05$).

According to the results, a statistically significant difference is presented between second year students and fourth year students. Second year students have more logical learning style than fourth year students (U=o, p<.05). There is also a statistically significant difference between third- and fourth-year students in this study. According to the results third year students have higher logical learning style than fourth year students (U=0, p<.05). Between third year students and graduate year students, a statistically significant difference was found. Graduate year students have statistically more logical learning styles than third year students in this study (U=378, p<.05). Moreover, between fourth year students and graduate year students there is a statistically significant difference. Graduate year students have more logical learning style than fourth year students in this study (U=0, p<.05).

On the other hand, statistically significant differences were not found between second year students and third year students, second year students and graduate year students (p>.05).

Table 25 *Mann-Whitney U Test Results of Audio-Visual Learning Sub-Dimension According to the Grade Levels*

E-Learning Styles	Grade Level	N	Mean Rank	Sum of Rank	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Audio-Visual Learning	First Year	6	27.50	165.0	.000	-3.808	<.001
	Second Year	24	12.50	300.0			
	Total	30					
Audio-Visual Learning	First Year	6	33.50	201.0	.000	-3.873	<.001
	Third Year	30	15.50	465.0			
	Total	36					
Audio-Visual Learning	First Year	6	15.50	93.0	.000	-3.571	<.001
	Fourth Year	12	6.50	78.0			
	Total	18					
Audio-Visual Learning	First Year	6	45.50	273.0	.000	-3.982	<.001
	Graduate	42	21.50	903.0			
	Total	48					
	Second Year	24	29.0	696.0	324.0	-.636	.525

Audio-Visual Learning	Third Year	30	26.30	789.0			
	Total	54					
Audio-Visual Learning	Second Year	24	17.75	426.0			
	Fourth Year	12	20.0	240.0	126.0	-.621	.534
	Total	36					
Audio-Visual Learning	Second Year	24	26.75	642.0			
	Graduate	42	37.36	1569.0	342.0	-2.178	.029
	Total	66					
Audio-Visual Learning	Third Year	30	20.30	609.0			
	Fourth Year	12	24.50	294.0	144.0	-1.012	.311
	Total	42					
Audio-Visual Learning	Third Year	30	28.10	843.0			
	Graduate	42	42.50	1785.0	378.0	-2.914	.004
	Total	72					
Audio-Visual Learning	Fourth Year	12	27.50	330.0			
	Graduate	42	27.50	1155.0	252.0	.000	1.00
	Total	54					

According to the test result, in terms of audio-visual learning style, a statistically significant difference was found between first year students and second year students. First year students have more audio-visual learning style than second year students ($U=0$, $p<.05$). There is also a statistically significant difference between first year students and third year students. First year students have more audio-visual learning style than third year students ($U=0$, $p<.05$). A statistically significant difference was determined between first year students and fourth year students in terms of audio-visual learning style. First year students have statistically higher audio-visual learning style than fourth year students ($U=0$, $p<.05$). There is also a statistically significant difference between first year students and graduate year students in this study. First year students have more audio-visual learning style than graduate year students ($U=0$, $p<.05$). Between second year students and graduate year students, there is also a difference.

Graduate year students have statistically more audio-visual learning style than second year students (U=342, p<.05).

Also, there is a statistically significant difference between third year students and graduate year students. Graduate year students have higher audio-visual learning style than third year students in this study (U=378, p<.05).

Additionally, statistically significant differences were not found between second year students and third year students, second year students and fourth year students, third year students and fourth year students and fourth year students and graduate year students (p>.05).

Table 26 *Mann-Whitney U Test Results of Verbal Learning Sub-Dimension According to the Grade Levels*

E-Learning Styles	Grade Level	N	Mean Rank	Sum of Rank	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Verbal Learning	First Year	6	27.50	165.0	.000	-3.907	<.001
	Second Year	24	12.50	300.0			
	Total	30					
Verbal Learning	First Year	6	33.50	201.0	.000	-3.873	<.001
	Third Year	30	15.50	465.0			
	Total	36					
Verbal Learning	First Year	6	15.50	93.0	.000	-3.571	<.001
	Fourth Year	12	6.50	78.0			
	Total	18					
Verbal Learning	First Year	6	45.50	273.0	.000	-4.006	<.001
	Graduate	42	21.50	903.0			
	Total	48					
Verbal Learning	Second Year	24	35.0	840.0	180.0	-3.206	.001
	Third Year	30	21.50	645.0			
	Total	54					
	Second Year	24	21.50	516.0	72.0	-2.485	.013

Verbal Learning	Fourth Year	12	12.50	150.0			
	Total	36					
Verbal Learning	Second Year	24	36.50	876.0			
	Graduate	42	31.79	1335.0	432.0	-.989	.323
	Total	66					
Verbal Learning	Third Year	30	20.90	627.0			
	Fourth Year	12	23.00	276.0	162.0	-.511	.609
	Total	42					
Verbal Learning	Third Year	30	27.50	825.0			
	Graduate	42	42.93	1803.0	360.0	-3.122	.002
	Total	72					
Verbal Learning	Fourth Year	12	18.50	222.0			
	Graduate	42	30.07	1263.0	144.0	-2.309	.021
	Total	54					

According to the test results, statistically significant differences were found between first year students and second year students, first year students and third year students, first year students and fourth year students, first year students and graduate year students, second year students and third year students, second year students and fourth year students, third year students and graduate year students and fourth year students and graduate year students in terms of verbal learning style ($p<.05$). However, there are no statistically significant difference between second year students and graduate year students, third year students and fourth year students in terms of verbal learning style ($p>.05$).

First year students have more verbal learning styles than second year students, third year students, fourth year students and graduate year students. Second year students have statistically higher verbal learning style than third year students and fourth year students. Third year students have more verbal learning styles than graduate year students ($U=360$, $p<.05$). Finally, fourth year students have more verbal learning style than graduate year students in this study ($U=144$, $p<.05$).

Table 27 *Mann-Whitney U Test Results of Intuitive Learning Sub-Dimension According to the Grade Levels*

E-Learning Styles	Grade Level	N	Mean Rank	Sum of Rank	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Intuitive Learning	First Year	6	21.50	129.0	36.0	-1.904	.057
	Second Year	24	14.0	336.0			
	Total	30					
Intuitive Learning	First Year	6	27.50	165.0	36.00	-2.324	.020
	Third Year	30	16.70	501.0			
	Total	36					
Intuitive Learning	First Year	6	15.50	93.0	.000	-3.571	<.001
	Fourth Year	12	6.50	78.0			
	Total	18					
Intuitive Learning	First Year	6	45.50	273.0	.000	-4.006	<.001
	Graduate	42	21.50	903.0			
	Total	48					
Intuitive Learning	Second Year	24	34.25	822.0	198.0	-2.873	.004
	Third Year	30	22.10	663.0			
	Total	54					
Intuitive Learning	Second Year	24	23.75	570.0	18.0	-4.349	<.001
	Fourth Year	12	8.0	96.0			
	Total	36					
Intuitive Learning	Second Year	24	50.0	1200.0	108.0	-5.349	<.001
	Graduate	42	24.07	1011.0			
	Total	66					
Intuitive Learning	Third Year	30	24.50	735.0	90.0	-2.554	.011
	Fourth Year	12	14.0	168.0			
	Total	42					
Intuitive Learning	Third Year	30	46.70	1401.0	324.0	-3.551	<.001
	Graduate	42	29.21	1227.0			

	Total	72					
Intuitive Learning	Fourth Year	12	26.0	312.0	234.0	-.387	.699
	Graduate	42	27.93	1173.0			
	Total	54					

According to the test results, statistically significant differences were found between first year students and third year students, first year students and fourth year students, first year students and graduate year students, second year students and third year students, second year students and fourth year students, second year students and graduate year students, third year students and fourth year students and third year students and graduate year students in terms of intuitive learning style ($p<.05$). However, there are no statistically significant difference between first year students and second year students, fourth year students and graduate year students in terms of intuitive learning style ($p>.05$).

First year students in this study have statistically higher intuitive learning style than third year students, fourth year students and graduate year students ($p<.05$). Second year students have more intuitive learning style than third year students, fourth year students and graduate year students ($p<.05$). On the other hand, third year students have statistically higher intuitive learning style than fourth year students and graduate year students ($p<.05$).

4.6 The level of Management Information Systems students' satisfaction about their school's e-learning system during Covid-19 pandemic

Research question: What is the level of Management Information Systems students' satisfaction about their schools' e-learning system during Covid-19 pandemic?

In the online survey instrument, six questions were presented to the participants to have their satisfaction level about their school's e-learning system during Covid-19 pandemic.

Table 28 *The level of Management Information Systems students' satisfaction about their school's e-learning system during Covid-19 pandemic*

	n	Mean	Standard Deviation
Satisfaction Level	114	18.53	6.126

When the results of the level of Management Information Systems students' satisfaction about their school's e-learning system during Covid-19 pandemic was examined, the mean score obtained from satisfaction level is 18.53 points. The total satisfaction score can be gathered from satisfaction related questions was 30 points. The mean is lower than the total score. The level of Management Information Systems students' satisfaction about their school's e-learning system during Covid-19 pandemic is low.

5. DISCUSSION

The purpose of this study is to analyze the relationship between e-learning styles and attitudes towards e-learning of Management Information Systems students who have experienced e-learning during Covid-19 pandemic and the change according to gender and grade level.

The results presented that audio-visual learning style is the learning style that the participants have the most. The higher e-learning predisposition scores means the participants have positive attitudes to use e-learning. The lower e-learning predisposition scores means the participants have negative attitudes to use e-learning. The higher e-learning avoidance score means the participants have positive attitudes to e-learning. The lower e-learning avoidance score means the participants are likely to avoid e-learning.

Independent learning style has positive and meaningful correlation with e-learning predisposition and e-learning avoidance. Audio-visual learning style has positive and meaningful correlation with e-learning predisposition and e-learning avoidance. Verbal learning style has positive and meaningful correlation with e-learning predisposition. The results presented that there is a statistically significant difference between male and female participants in terms of e-learning avoidance. Male participants have higher e-learning avoidance scores than female participants in this study. However, the results showed that there is no statistically significant difference between male and female participants in terms of e-learning predisposition. On the other hand, in terms of e-learning predisposition and e-learning avoidance there are statistically significant differences between grade levels. In terms of e-learning predisposition, first grade students have statistically higher results than third grade students, fourth grade students and graduate year students. Second grade students have higher e-learning predisposition than third grade students and graduate year students. Third year students

have more e-learning predisposition than fourth grade students and fourth grade students have higher e-learning predisposition than fifth grade students. In terms of e-learning avoidance, first year students have higher scores than second year students, third year students and fifth year students. Moreover, second year students have higher e-learning avoidance than third year students and fifth year students. Third year students have higher e-learning avoidance than fourth year students. Finally, fourth year students have more e-learning avoidance than fifth year students. Moreover, it was obtained that there is statistically significant difference between male and female participants in terms of independent learning, active learning, and verbal learning. Male participants have higher independent learning style than female participants. Female participants have more active learning style and verbal learning style than male participants. As a result of the tests, statistically significant difference was found between grade levels in terms of independent learning, social learning, active learning, logical learning, audio-visual learning, verbal learning and intuitive learning.

The reason that causes the correlation between independent learning and attitudes towards learning can be investigated with further studies.

The reason that causes the correlation between audio-visual learning and attitudes towards learning can be investigated with further studies.

There is a statistically significant difference between grade levels in terms of attitudes towards e-learning. Further research and studies can be done on the reason for this difference.

In terms of e-learning styles, statistically significant difference were found between grade levels. Second year students have statistically higher level of independent learning than first year students. Third year students have statistically higher independent learning style than first year students. Second year students have higher independent learning style than graduate year students. Third year students have higher independent learning styles than fourth year students. Third year students have statistically higher independent learning than graduate year students. First year students have statistically higher social learning style than third year students in this study. Second year students have more social learning style than third year students in this study**.** Fourth year students have statistically higher social learning styles than third year students. Graduate year students have statistically higher social learning style than third year students in this study. First year students have statistically higher active learning styles than third year students. First year students have higher active learning style than

fourth year students in this study. First year students have more active learning style than graduate year students. Second year students have higher active learning styles than fourth year students in this study. Second year students have higher active learning style than graduate year students. First year students have higher logical learning style than second year students. First year students have more logical learning style than third year students in this study. First year students have higher logical learning style than fourth year students. First year students have statistically higher logical learning styles than graduate year students. Second year students have more logical learning style than fourth year students. According to the results third year students have higher logical learning style than fourth year students. Graduate year students have statistically more logical learning styles than third year students in this study. Graduate year students have more logical learning style than fourth year students in this study. First year students have more audio-visual learning style than second year students. First year students have more audio-visual learning style than third year students. First year students have statistically higher audio-visual learning style than fourth year students. First year students have more audio-visual learning style than graduate year students. Graduate year students have statistically more audio-visual learning style than second year students. Graduate year students have higher audio-visual learning style than third year students in this study. First year students have more verbal learning styles than second year students, third year students, fourth year students and graduate year students. Second year students have statistically higher verbal learning style than third year students and fourth year students. Third year students have more verbal learning styles than graduate year students. Finally, fourth year students have more verbal learning style than graduate year students in this study.

First year students in this study have statistically higher intuitive learning style than third year students, fourth year students and graduate year students. Second year students have more intuitive learning style than third year students, fourth year students and graduate year students. On the other hand, third year students have statistically higher intuitive learning style than fourth year students and graduate year students.

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7. APPENDIX A

The survey that was used for data collection in Turkish.

1. Email	
2. Lütfen cinsiyetinizi seçiniz.	( ) Kadın ( ) Erkek
3. Lütfen yaşınızı seçiniz.	( ) 17 ve altı ( ) 18 - 20 ( ) 21 - 23 ( ) 24 - 26 ( ) 27 ve üstü
4. Lütfen bölümünüzü giriniz.	
5. Lütfen yaşınızı seçiniz.	( ) 1. Sınıf ( ) 2. Sınıf ( ) 3. Sınıf ( ) 4. Sınıf ( ) Yüksek Lisans ya da Doktora

No	Aşağıdaki maddeleri okuyarak size en uygun olan seçeneği seçiniz. 1- Kesinlikle Katılmıyorum 2 - Katılmıyorum 3 - Kararsızım 4 - Katılıyorum 5 - Kesinlikle Katılıyorum	Kesinlikle Katılmıyorum	Katılmıyorum	Karasızım	Katılıyorum	Kesinlikle Katılıyorum
1	E-öğrenme ortamında öğrenmek isterim.	1	2	3	4	5
2	E-öğrenmenin yararlı olacağını düşünmüyorum.	1	2	3	4	5

3	E-öğrenme gereksizdir.	1	2	3	4	5
4	E-öğrenme ile eğitim alma fikri kendimi kötü hissetmeme sebep olur.	1	2	3	4	5
5	E-öğrenme eğlencelidir.	1	2	3	4	5
6	E-öğrenme, öğrenmeyi kolaylaştırır.	1	2	3	4	5
7	E-öğrenme ile ilgili gelişmeleri takip ederim.	1	2	3	4	5
8	E-öğrenme ile ders aldığımda çok fazla sorunla karşılaşacağımı düşünüyorum.	1	2	3	4	5
9	E-öğrenme yaygınlaşmalıdır.	1	2	3	4	5
10	E-öğrenme sosyalleşmeyi engeller.	1	2	3	4	5
11	E-öğrenme ders çalışma şeklime uymuyor.	1	2	3	4	5
12	E-öğrenme ilgimi çeker.	1	2	3	4	5
13	E-öğrenmede değerlendirme işlemi sağlıklı bir şekilde yapılamaz.	1	2	3	4	5
14	E-öğrenmede yüz-yüze etkileşim olmaması beni rahatsız eder.	1	2	3	4	5
15	E-öğrenme motivasyonu arttırır.	1	2	3	4	5

16	E-öğrenme başarıyı arttırır.	1	2	3	4	5
17	E-öğrenme öğrenenin üretkenliğini arttırır.	1	2	3	4	5
18	E-öğrenmede yeterli öğretmen desteği alabileceğimi düşünmüyorum.	1	2	3	4	5
19	E-öğrenme ortamında öğrenmeyi sevmiyorum.	1	2	3	4	5
20	E-öğrenme ile kendi hızımda çalışmak hoşuma gider.	1	2	3	4	5
21	Öğrenme sürecinde en iyi kendi kendime çalışarak öğrenirim.	1	2	3	4	5
22	Yönlendirilmiş olarak bağımsız çalışmayı tercih ederim.	1	2	3	4	5
23	Bir dersten alabildiğim kadar çok şey almak benim sorumluluğumdadır.	1	2	3	4	5
24	Kendi başıma öğrenme konusundaki yeteneğime oldukça güvenirim.	1	2	3	4	5
25	Öğrenirken farklı-zamanlı etkinliklere katılmak daha çok hoşuma gider (forum, blog, wiki vb.).	1	2	3	4	5

26	E-öğrenme yöntemi ile öğrenirken diğer öğrencilerle etkileşimli bir şekilde grup çalışmaları yapmayı severim.	1	2	3	4	5
27	Eğitmenimle ve arkadaşlarımla iyi ilişkiler kurmak benim için önemlidir.	1	2	3	4	5
28	Grup çalışması gerektiren etkinlikleri ve projeleri daha çok tercih ederim.	1	2	3	4	5
29	Öğrenirken eş-zamanlı etkinliklere katılmak daha çok hoşuma gider (sohbet, sanal sınıf, beyaz tahta uygulaması vb.).	1	2	3	4	5
30	Grup çalışmaları yaparken çalışmaya yön vermek ve katkı sağlamak çok hoşuma gider.	1	2	3	4	5
31	Yolda, çalışırken veya işte müzik dinlemekten çok hoşlanırım.	1	2	3	4	5
32	Bir müzik aleti çalabilir veya şarkı söyleyebilirim.	1	2	3	4	5

33	Spor ve dans gibi etkinlikler yapmayı çok severim.	1	2	3	4	5
34	Seramik ve heykel gibi el sanatları ile uğraşmayı çok severim.	1	2	3	4	5
35	Giysi, mobilya veya diğer nesnelere dokunarak dokularını hissetmeyi severim.	1	2	3	4	5
36	Oyun oynayarak ve simülasyonlar aracılığı ile öğrenmeyi çok severim.	1	2	3	4	5
37	Matematik, fen ve teknoloji en sevdiğim konulardır.	1	2	3	4	5
38	Hesaplama gerektiren işlemlerle uğraşmayı severim.	1	2	3	4	5
39	Satranç gibi mantık oyunları oynamayı ve bulmaca çözmeyi çok severim.	1	2	3	4	5
40	İnsanların farklı deneyimlerine ilişkin paylaşımlarını dinlemekten çok hoşlanırım.	1	2	3	4	5
41	Farklı nesnelere ait sesleri kolayca ayırt edebilir, sesin neye ait	1	2	3	4	5

	olduğunu söyleyebilirim.					
42	Derslerde konuyu detaylı olarak anlatan öğretmenleri tercih ederim.	1	2	3	4	5
43	En iyi "görerek" öğrendiğimi düşünüyorum.	1	2	3	4	5
44	Pek çok şekil, karikatür ve tablo içeren kitapları daha çok severim.	1	2	3	4	5
45	Görsel nesneleri, planları ve durumları kolayca hatırlarım.	1	2	3	4	5
46	Araştırmayı ve keşfetmeyi çok severim.	1	2	3	4	5
47	Çok "gerçekçi" olduğum söylenebilir.	1	2	3	4	5
48	En iyi "okuyarak" öğrendiğimi düşünüyorum.	1	2	3	4	5
49	Günlük konuşmalarımda duyduğum veya gördüğüm bilgilerle çok sık bağlantı kurarım.	1	2	3	4	5
50	Fıkra ve hikâye anlatmayı çok severim.	1	2	3	4	5

51	Edebiyat, tarih ve yabancı dil en sevdiğim konulardır.	1	2	3	4	5
52	Çok geniş bir kelime bilgim vardır ve doğru kelimeyi doğru yerde kullanmayı severim.	1	2	3	4	5
53	Kendimi yazılı veya sözlü olarak çok iyi ifade ederim.	1	2	3	4	5
54	En iyi "detaylı düşünerek" öğrenirim.	1	2	3	4	5
55	En iyi "duygularımla ilişkilendirerek" öğrenirim.	1	2	3	4	5
56	Adım adım ve hiyerarşik süreçler yerine rastgele akışları tercih ederim.	1	2	3	4	5
57	Problemleri çözerken sezgilerimi kullanırım.	1	2	3	4	5
58	Öğrenme sürecimin başkaları tarafından planlanmasından hoşlanmam.	1	2	3	4	5
59	Pandemi döneminde okulumun seçtiği e-eğitim sistemini kolaylıkla kullandım.	1	2	3	4	5
60	Pandemi döneminde çevrimiçi derslerde konuları iyi	1	2	3	4	5

	öğrendiğimi düşünüyorum.					
61	Pandemi döneminde çevrimiçi dersleri veren öğretim üyeleriyle iletişim kurabildim.	1	2	3	4	5
62	Pandemi döneminde çevrimiçi derslerde sınıf arkadaşlarımla iletişim kurabildim.	1	2	3	4	5
63	Pandemi döneminde çevrimiçi sınavlara rahatlıkla katıldım.	1	2	3	4	5
64	Pandemi döneminde okulumun geliştirdiği uzaktan eğitim stratejilerinden ve yaklaşımından memnunum.	1	2	3	4	5

8. APPENDIX B

The permission e-mail from Yasemin Gülbahar to use "E-Learning Styles Scale for Electronic Environments" in the study.

12/28/22, 12:34 PM Gmail - Elektronik Ortamlar için e-Öğrenme Stilleri Ölçeği Kullanım İzni Hakkında

Gmail Nazlican Lule Ercan <[redacted]

Elektronik Ortamlar için e-Öğrenme Stilleri Ölçeği Kullanım İzni Hakkında
2 ileti

Nazlican Lule Ercan [redacted] 14 Aralık 2021 11:23
Alıcı: [redacted]
Bcc: Nazlican Lule [redacted]

Yasemin Hocam merhabalar,

Umarım iyisinizdir. İsmim Nazlıcan Lüle Ercan. Yüksek lisans çalışmam kapsamında Ayfer Hocam ile geliştirdiğiniz Elektronik Ortamlar için e-Öğrenme Stilleri Ölçeği'ni kullanmak istiyorum. İzninizi almam mümkün müdür?

Ek olarak ölçeğin son halini ve puanlandırma detaylarını benimle paylaşabilirseniz çok mutlu olurum.

Teşekkür ederim.
İyi çalışmalar dilerim.

Saygılarımla,
Nazlıcan Lüle Ercan

Yasemin Gülbahar <[redacted] 15 Aralık 2021 14:06
Alıcı: Nazlican Lule Ercan [redacted]

Nazlıcan merhaba,

Ölçek ektedir. Puanlama için net bir tanım yok. Hangi stiller baskın çıkarsa o yaklaşımla öğrenme ihtimali daha fazla şeklinde yorumlayabiliyoruz.

Başarılar dilerim.
YG
[Alıntılanan metin gizlendi]

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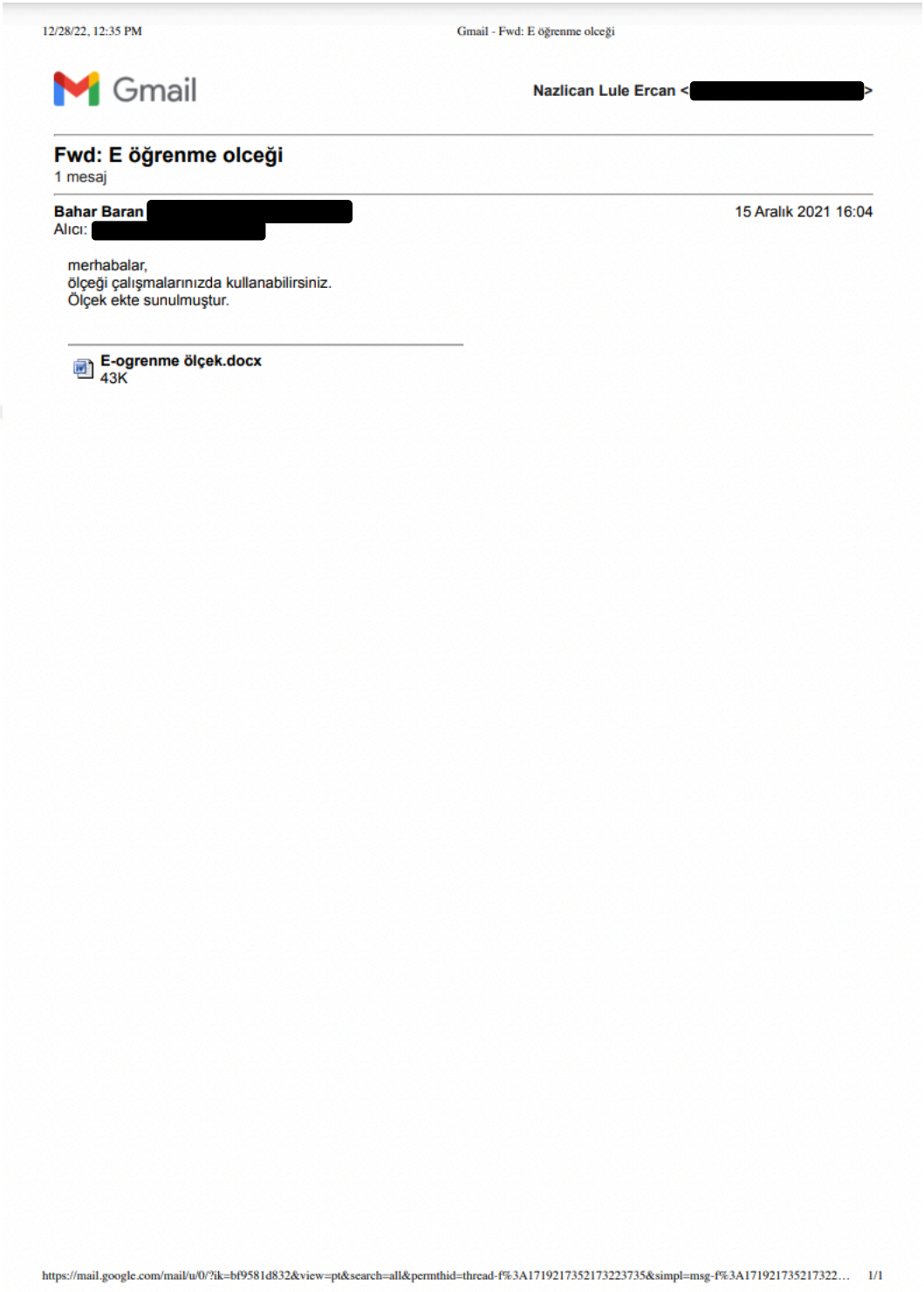
9. APPENDIX C

The permission e-mail from Bahar Baran to use “General Attitude Scale Towards E-Learning” in the study.



12/28/22, 12:35 PM Gmail - Fwd: E öğrenme olceği

Gmail

Nazlican Lule Ercan <[redacted]>

Fwd: E öğrenme olceği

1 mesaj

Bahar Baran [redacted] 15 Aralık 2021 16:04

Alıcı: [redacted]

merhabalar,
ölçeği çalışmalarınızda kullanabilirsiniz.
Ölçek ekte sunulmuştur.

E-ogrenme ölçek.docx
43K

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10. APPENDIX D

Ethics Committee Approval

T.C.
YEDİTEPE ÜNİVERSİTESİ REKTÖRLÜĞÜ

04.03.2023

Sayı : E.50532705-302.14.01-1500
Konu : Nazlıcan Lüle Ercan Kurul Onayı

İLGİLİ MAKAMA

Üniversitemiz Sosyal Bilimler Enstitüsü Yönetim Bilişim Sistemleri Yüksek Lisans Öğrencisi Nazlıcan Lüle Ercan'ın, Doç. Dr. Uğur Tevfik Kaplancalı danışmanlığında gerçekleştireceği ''The Relationship Between Management and Information System Students' E-Learning Styles and Attitudes Towards E-Learning In Turkey During Covid-19 Pandemic'' başlıklı araştırmasının Beşeri Bilimler etik standartlarına uygunluğuna ilişkin Yeditepe Üniversitesi Beşeri ve Sosyal Araştırmalar Etik Kurulu Onayı ekte sunulmuştur.

Gerekli iznin verilmesi hususunu bilgilerinize arz ve rica ederim.

İmza
Prof. Dr. Fatma Yeşim EKİNCİ
Rektör a.
Rektör Yardımcısı

Ek: Etik Kurul Onayı.pdf

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