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MASTER'S PROGRAM IN CURRICULUM AND INSTRUCTION

**EXAMINATION OF THE RELATIONSHIP BETWEEN 21st CENTURY
LEARNING SKILLS AND DIGITAL LITERACY LEVELS OF UNIVERSITY
STUDENTS**

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SKILLS AND DIGITAL LITERACY LEVELS OF UNIVERSITY STUDENTS



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Bütün hayatım boyunca maddi ve manevi yanımda olan, emeklerini ve desteklerini her zaman hissettiğim, bana en çok güvenen, başarımlarımda benden daha mutlu olan ve her zaman destekçim olan, abime, anneme, ve babama teşekkür ederim.



ABSTRACT

The aim of this research is to determine relationship between the 21st century skills, digital literacy levels of university students. The sample of the research consists of a total of 122 students, 81 girls and 41 boys, studying at 19 state and 14 private universities in different provinces of Turkey in the 2020-2021 academic year.

In this study, survey model one of the descriptive research methods, was used and was applied. Two scales were used as data collection tool in the study. These scales were 21st Century Learner Skills Scale was developed by Orhan Göksun (2016) and Digital Literacy Scale was developed by Hamutoğlu et al (2017).

The first scale used in accordance with the purpose of the research is “21st Century Learner Skills Usage Scale. The scale consists of 5-point Likert type and 31 items. The reliability level of the scale is high. ($\alpha=.98$). The 21st Century Learner Skills Usege Scale consists of four sub-dimensions: cognitive skills, autonomous skills, cooperation and flexibility skills, and innovation skills. The Digital Literacy Scale consists of 5-point Likert type and 17 items. The reliability level of the scale is high. ($\alpha=.93$). The digital literacy scale consists of four sub-dimensions: attitude, technical, cognitive and social.

Frequency, percentage, mean, standard deviation, independent samples t-test, one-way analysis of variance (ANOVA) were used for the analysis of the data. The Pearson Product-Moment Correlation Analysis was conducted for the relationship between university sutdensts' perceptions of 21st century learner skills and their levels of digital literacy.

As a result of the analysis of the data obtained in the research, when the 21st century learner skills and digital literacy levels are compared, there does not appear to be a significant difference in the average scores of the variables of gender, department and class level. The

sub-dimensions of the 21st century learner skills scale are evaluated; the average of the scores of the university students participating in the research from the expressed sub-dimensions of the scale is $\bar{x} = 89.94$; It is seen that $\bar{x} = 53.61$ and $\bar{x} = 15.5$. It can be said that the cognitive skill dimension of university students, one of the sub-dimensions of the 21st century learner skills scale, is at a high level. According to the gender variable, there is no significant difference between the attitude, technical, cognitive and social sub-dimensions of the digital literacy scale of university students according to gender. When the relationship between the 21st century learner skills and digital literacy levels of university students was examined in the sub-dimensions, it was seen that there were generally low and moderate positive significant relationships. students. Cognitive skills ($r = .444$; $p < 0.01$), which are sub-dimensions of the 21st century learner skills scale, and cooperation and flexibility skills ($r = .432$; $p < 0.01$), which are one of the sub-dimensions of the digital literacy scale.

In line with the results of this study, some suggestions are given to the researchers. The first of these suggestions is to prioritize 21st century skills in the curriculum preparation process. Different studies can be conducted on the application of 21st century skills. Considering that all components of the prepared curricula are interrelated, consistent curricula should be prepared in order to cover all 21st century skills. New content should be added to the education programs for the needs of our age or changes should not be made in the existing content. Considering that students are very intertwined with technology, courses on digital literacy can be added to the curriculum. In order to develop 21st century skills such as digital literacy, information and technology literacy, critical thinking and problem solving of university students, technology-supported lessons should be carried out by using techniques such as learning by doing and experiencing and active learning.

Keywords: 21st century learner skills, digital literacy, university students

ÖZET

Bu araştırmanın amacı, üniversite öğrencilerinin 21. yüzyıl becerileri, dijital okuryazarlık düzeyleri ve aralarındaki ilişkiyi belirlemektir. Araştırmanın örneklemini 2020-2021 eğitim öğretim yılında Türkiye'nin farklı illerinde bulunan 19 devlet ve 14 özel üniversitede öğrenim gören 81 kız ve 41 erkek olmak üzere toplamda (N=122) öğrenci oluşturmaktadır.

Bu çalışmada betimsel araştırma yöntemlerinden tarama modeli kullanılmıştır ve tarama modellerinden birisi olan ilişkisel tarama uygulanmıştır.

Araştırmada veri toplama aracı olarak iki adet ölçek kullanılmıştır. Bu ölçekler sırasıyla, Orhan Göksun (2016) tarafından geliştirilen 21. Yüzyıl Öğrenen Becerileri Kullanımı Ölçeği ve Hamutoğlu vd (2017) tarafından geliştirilen Dijital Okuryazarlık Ölçeği' dir.

Araştırmanın amacına uygun olarak kullanılan ilk ölçek "21. Yüzyıl Öğrenen Becerileri Kullanım Ölçeği"dir. Ölçek 5'li likert tipi ve 31 maddeden oluşmaktadır. Ölçeğin güvenilirlik seviyesi yüksektir ($\alpha=.98$). 21. Yüzyıl Öğrenen Becerileri Kullanımı Ölçeği bilişsel beceriler, otonom beceriler, iş birliği ve esneklik becerileri ve yenilikçilik becerileri olmak üzere dört alt boyuttan oluşmaktadır. Dijital Okuryazarlık Ölçeği 5'li likert tipi 17 maddeden oluşmaktadır. Ölçeğin güvenilirlik seviyesi yüksektir ($\alpha=.93$). Dijital okuryazarlık ölçeği tutum, teknik, bilişsel ve sosyal olmak üzere dört alt boyuttan oluşmaktadır.

Verilerin analizi için tanılayıcı analizler yapılmıştır, bağımsız örneklemler t-testi, tek yönlü varyans analizi(ANOVA) kullanılmıştır. Üniversite öğrencilerinin 21. yüzyıl öğrenen becerileri ile dijital okuryazarlık düzeyleri arasındaki ilişki için Pearson Momentler Çarpımı Korelasyon Analizi yapılmıştır.

Araştırmada elde edilen verilerin analizi sonucunda 21. yüzyıl öğrenen becerileri ve dijital okuryazarlık düzeyleri karşılaştırıldığında cinsiyet, bölüm ve sınıf düzeyi değişkenlerine ait ortalama puanlarında anlamlı bir farklılık gözükmemektedir. Üniversite öğrencilerinin 21. yüzyıl öğrenen becerileri ölçeğinin alt boyutlarından bilişsel beceri boyutunun yüksek düzeyde olduğu söylenebilir. Üniversite öğrencilerinin cinsiyet değişkenine göre dijital okuryazarlık ölçeğinin alt boyutları arasında cinsiyete göre anlamlı bir farklılık yoktur.

Üniversite öğrencilerinin 21. yüzyıl öğrenen becerileri ve dijital okuryazarlık düzeyleri arasında ilişki alt boyutlarında incelendiğinde genel olarak düşük düzeyde ve orta düzeyde pozitif ve anlamlı ilişkiler olduğu görülmüştür.

Araştırmanın sonunda elde edilen sonuçlara göre 21. yüzyıl öğrenen becerileri ölçeğinden alınabilecek en yüksek puan 124 iken, araştırmaya katılan üniversite öğrencilerinin ölçeğin toplamından aldıkları puan ortalamasının ($\bar{x} = 89,94$) olduğu görülmektedir. Bu bulgulara göre üniversite öğrencilerinin 21. yüzyıl öğrenen becerileri kullanım düzeylerinin genel ortalamasının yüksek olduğu söylenebilir. Bulgular incelendiğinde, üniversite öğrencilerinin ölçeğin alt boyutlarından bilişsel beceri boyutunun yüksek düzeyde olduğu söylenebilir. 21. yüzyıl öğrenen becerileri ölçeği ile dijital okuryazarlık ölçeğinden aldıkları puanların cinsiyete göre değişip değişmediğine ilişkin t-testi sonuçlarına göre üniversite öğrencilerinin 21. yüzyıl öğrenen becerilerini kullanımına yönelik düzeyleri ve dijital okuryazarlık düzeyleri arasında cinsiyete göre anlamlı bir farklılık yoktur. Üniversite öğrencilerinin var olan dijital okuryazarlık düzeyleri incelendiğinde, hem ölçeğin alt boyutlarında hem de ölçeğin tamamında dijital okuryazarlık düzeylerinin yüksek düzeyde olduğu söylenebilir. 21. yüzyıl öğrenen becerileri ölçeğinin alt boyutları ile dijital okuryazarlık ölçeğinin alt boyutları arasındaki ilişkiyi belirlemeye

yöneliktir. Üniversite öğrencilerinin 21. yüzyıl öğrenen becerileri ile dijital okuryazarlık düzeyleri arasındaki ilişkiye dair korelasyon analizi sonuçları incelenmiştir. Bulgular incelendiğinde 21. yüzyıl öğrenen becerileri ile dijital okuryazarlık düzeyleri arasında orta düzeyde, pozitif ve anlamlı bir ilişki olduğu görülmektedir ($r=,498$; $p<0,01$). Üniversite öğrencilerinin 21. yüzyıl öğrenen becerileri arttıkça dijital okuryazarlık düzeyleri de artmaktadır.

Bu çalışmanın sonuçları doğrultusunda araştırmacılara bazı öneriler verilmektedir. Bu önerilerden ilki, 21. yüzyıl becerilerinin öğretim programı hazırlık sürecinde ön planda tutulmasıdır. 21. yüzyıl becerilerinin uygulanmasına yönelik farklı araştırmalar yapılabilir. Hazırlanan öğretim programlarının tüm bileşenlerinin birbiri ile olan ilişkisi olduğu düşünüldüğünde 21. yüzyıl becerilerinin tümünü kapsamı bakımından tutarlı öğretim programları hazırlanmalıdır. bulunduğumuz çağın ihtiyaçlarına yönelik eğitim programlarına yeni içerikler eklenmeli ya da var olan içeriklerde değişikliklere gidilmelidir. Öğrencilerin teknolojiyle fazlasıyla iç içe oldukları düşünüldüğünde özellikle dijital okuryazarlık üzerine müfredata dersler eklenebilir. Üniversite öğrencilerinin dijital okuryazarlığı, bilgi ve teknoloji okuryazarlığı, eleştirel düşünme ve problem çözme gibi 21. yüzyıl becerilerinin geliştirilmesi için derslerde teknoloji destekli ve yaparak-yaşayarak öğrenme ve aktif öğrenme gibi tekniklerden yararlanılarak yürütülmelidir.

Anahtar Kelimeler: 21. yüzyıl becerileri, dijital okuryazarlık, üniversite öğrencileri

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CHAPTER 1: INTRODUCTION

It is seen that the individual qualities needed in the 21st century have changed due to social, political, economic and technological developments. These developments also affect education systems and have made it necessary to make changes in the knowledge, skills and competencies that should be gained by individuals.

There is an ongoing effort in schools to get students to acquire the 21st century skills such as creativity, critical thinking, communication, cooperation, information and communication technologies literacy, and social and cultural competencies.

The main purpose of the education process is to equip people to be in harmony with their surroundings and to enable them to become productive people. Technological tools offer wide range of opportunities for individuals to acquire contemporary knowledge, skills and attitudes in order to adapt to social life. For this reason, the changes in the field of technology force educators to recognize these developments, to develop and direct them and to rebuild them (Çoban, 2007).

Learning has become the activity of producing knowledge by communicating with individuals who think collaboratively, critically and creatively; literacy has gone beyond reading and writing from printed materials (Hamarat, 2019). In today's conditions, reading, writing and four-process skills are no longer sufficient. In addition to mother tongue literacy; Competencies have been established in many fields such as information literacy, information and communication technologies literacy, science literacy, mathematical literacy, art literacy and foreign language literacy (Gelen, 2017).

Education-teaching environments have been affected by the changing and developing world conditions, like many other fields. There have been many changes, starting from the technologies used in education and teaching, to teacher competencies. In the education system, teachers and students have been the most important people affected by this change. With the emergence and spread of the concepts of digital native and digital immigrant, the roles of students and teachers have begun to be explained with their individual characteristics. According to Palfrey and Gasser (2008), digital natives interact the most with their friends and family. After friends and family, digital natives interact the most with teachers, coaches, and mentors.

The skills of the 21st century differ from the centuries we have left behind since it has a more complex infrastructure. The reason for this difference and complexity is the constant variability and fluidity that we see in people's whole lives. Education, such as economy, politics, culture and art, is also affected by this fluid and ever-changing system. For this reason, education systems should be re-examined and new education policies should be created at the end of this review. From this point of view, this study, it is aimed to determine the relationship between university students' 21st century learner skills and digital literacy levels.

1.1. Purpose and Importance of the Research

The aim of this study is to understand how well university students have mastered the 21st century learner skills in acquiring and constructing information, and in this context, to reveal whether there is a significant difference between their digital literacy levels and the variables of gender, department and grade level.

1.2. Problem Statement

Problem statement of the research is stated as below:

Is there a relationship between university students' levels of using 21st century learner skills and their digital literacy levels?

Accordingly, the sub-problems were determined as follows.

1. What are the scale scores of university students regarding the level of use of 21st century learner skills?
2. Does it differ significantly in terms of
 - a. gender,
 - b. department,
 - c. grade level scale scores of university students' level of use of 21st century learner skills and digital literacy levels?
3. What is the current digital literacy level of university students?
4. Is there a significant relationship between university students' levels of using 21st century learner skills and their digital literacy levels?

CHAPTER 2: LITERATURE REVIEW

2.1. 21st Century Learner Skills

Defining the characteristics of learners is important when preparing a curriculum (Callison & Lamb, 2004). In this context, there are 21st century learners in today's education system. In order to increase the effectiveness of teaching processes, it will be beneficial to get to know 21st century learners and define their skills.

There are many different views on what 21st century skills are in the literature. These different views are given below.

Qualities such as creativity, innovation, critical thinking and problem solving, which are under the 21st century skills, have become a necessity for one's self-realization and adaptation to the era. In addition to the skills used in the past, new-age skills such as technology and information literacy are among the 21st century skills. Therefore, all of these skills are called 21st century skills (as cited in Ekici et al., 2017).

Ekici et al. (2017) reached a total of 63 skills. These skills were reached by analyzing the skills in 19 sources. Skills such as problem solving, collaboration, critical thinking, information and technology literacy are the most used skills. Founded by the United States of America "21. "Partnership for 21st Century Skills" organization has gathered these skills (P21, 2015). He gathered these skills in three main categories as Learning and Innovation, Information, Media and Technology and Life and Career skills. The content, themes and support systems for the acquisition of relevant skills for the information age, which are included in these categories, are explained (P21, 2015). 21st century skills are included in the literature as P21. The framework for 21st century skills is shown in Figure 1.



Figure 1. 21st Century Skills Framework (P21, 2015)

Basic Subjects: English, Reading and Language Arts, World Languages, Science, Mathematics, Economics, History, Geography, Government Administration and Civics.

21st century Themes; Environmental Literacy, Health Literacy, Global Awareness, Finance, Entrepreneurship, Civics.

Learning and Renewal Skills; Creativity and Renewal Skills, Critical Thinking and Problem Solving, Communication and Collaboration Skills.

Information, Media and Technology Skills; Information and Communication Technologies Literacy, Information Literacy and Media Literacy.

Life and Professional Skills; Flexibility and Adaptation, Entrepreneurship and Self-Management, Sociocultural Skills, Productivity and Accountability, Leadership and Responsibility.

Support Training Systems; Standards and Assessment, Curriculum and Instruction, Professional Development and Learning Environments.

2.1.1. Content Information and 21st Century Themes

Science, government and civics, world languages, art, mathematics, history and geography are among the 21st century skills. These disciplines constitute the basic subjects for students. These disciplines should be addressed within the framework of global awareness, civics, health literacy, environmental literacy, finance-business and entrepreneurial literacy themes (P21, 2015).

Global awareness can be defined as being aware of the problems that concern all humanity and the problems caused by these problems, and the ability to produce solutions using 21st century skills. Different cultures, beliefs and social formations create cultural differences and richness. With this understanding, global awareness is based on the agreement of cultures in respect and cooperation (P21, 2015).

Within the scope of 21st century skills, the individual plays an active role in the policies regarding citizenship knowledge, access, evaluation and use of information. It is based on the protection of the fundamental rights and freedoms of the individual at the national and global level. In addition, it is defined as awareness of the effectiveness of decisions taken by governments on citizenship rights at the national and global levels (P21, 2015).

Health literacy; It can be defined as the individual's ability to obtain and interpret information about basic health and use related health services. Health literacy includes protective physical and mental process awareness. These awarenesses include measures such as diet, balanced nutrition, exercise and avoidance of stress. In addition to the dimensions such as establishing, monitoring and evaluating the individual's own and their family's health goals, it is to protect public health and to follow relevant health policies in international dimensions and to be related to global health problems (P21, 2015).

Environmental literacy; Evaluating the conditions and impact areas of the living and non-living elements that make up the environment and the factors affecting the environment, and being conscious of the environment. Analyzing environmental problems, producing effective solutions to these problems and being aware of them. Social factors such as population growth, production and consumption can be given as examples of factors affecting the environment, and environmental literacy is being aware of the impact of these factors on the environment. It is to be involved in activities such as finding solutions to environmental problems and participating in global actions (P21, 2015).

Financial and entrepreneurial literacy; awareness of the role of the economy in society. It is the awareness of being able to make economic choices in the current income and expense system of the individual. It includes increasing the career preferences of individuals by using their entrepreneurial skills and increasing the productivity of their workplaces (P21, 2015).

2.1.2. Learning and Innovation Skills

The skills that individuals should have in life and work environments in the 21st century are called learning and innovation skills. These skills include critical thinking, problem solving and creative thinking skills.

Analytical thinking, entrepreneurship, working together and decision making skills are included under communication and cooperation skills (MEB, 2013; 2017a).

Creativity skill is based on diversifying, changing or adapting the existing (Özden, 2014). Creativity is viewed from different angles in education, arts and sciences. Creativity is seen as a product obtained in science, the process of expressing emotions in art, and an individual who thinks freely, questions and researches in education (Adıgüzel, 2015).

In order to have the creativity skill defined as the 21st century skill, the individual must have an original, flexible and sensitive mindset. Individuals are forced to be creative in order to enable companies to exist in the globalizing world and to respond to the changing trends in the business world and customer demands (Eryılmaz & Ulusoy, 2015).

Critical thinking is a mental process that tries to understand the individual and the events around him and aims to consider the thoughts of the people he interacts with (Özden, 2014). Individuals with critical thinking skills can analyze the information they have obtained, make inferences, and transfer the results obtained from their experiences to other situations (Özden, 2014).

Individuals with problem-solving skills develop new solutions to problems, strive to overcome obstacles and develop solutions. Every individual should have problem solving skills because problems and difficulties can be encountered in every field. Therefore, problem solving skill is one of the basic skills to be possessed (Eryılmaz & Ulusoy, 2015). The characteristics of creativity skills such as being aware of the problem, being sensitive to the problem and producing solutions to the problem show that they are closely related to problem solving skills (Karakuş, 2011).

Collaboration skills include the ability of individuals to gather for the same purpose, to have common interests, and to work partnership. One of the ways of learning in education is the collaborative skill. It is aimed to work in cooperation by making the most of the personal differences of individuals. Working in cooperation with other individuals, accessing and evaluating information, and producing new information have become mandatory in the century we live in (P21, 2015).

2.1.3. Information, Media and Technology Skills

Individuals are intertwined with technology, media and rich environments in the information age. Due to the rapid change of technological tools, easy access to information and unlimited knowledge, individuals need to have the skills to use, analyze and evaluate information, media and technology effectively in order to become citizens of the 21st century (P21, 2015).

Due to technological developments, the proliferation of information sources, the rapid spread and access of information cause an information explosion. In this case, the ethical and legal dimensions of the information obtained were also highlighted. Effective use of information, caring for and evaluating its ethical and legal dimensions, and producing new information define information literacy (Anagün et al., 2016; Eryılmaz & Ulusoy, 2015).

Information and communication technologies literacy is one of the compulsory skills that should be acquired by individuals in the 21st century. The digitization of communication has increased the importance of this skill. This skill refers to the use and evaluation of knowledge and to benefit from digital tools in the production of new knowledge (Eryılmaz & Ulusoy, 2015).

With media literacy skills, individuals are able to reach, analyze, evaluate and transmit media-based messages (Karakoyun, 2014). Media literacy, which is one of the 21st century skills, should be acquired at an early age. The reason for this is to ensure that the information coming from the media can be differentiated between reality and fiction. Because children are the most vulnerable group exposed to the media. In addition, it is of great importance to have individuals who can analyze the media correctly in business life and have a critical eye (Eryılmaz & Ulusoy, 2015; Karakoyun, 2014).

2.1.4. Life and Career Skills

Life and career skills are features such as adapting to changing living conditions of individuals, using the advantages of individual differences, living together, producing projects, and being aware of global problems. Individuals with these skills form the basis of society (P21, 2015).

Flexibility and adaptability are the first of life and career skills. The ability of an individual to adapt to changing work and living conditions is one of the basic conditions of being able to exist in the world that is going through the process of change. Individuals with this skill can maintain a balance between their beliefs and reactions, and they can manage their duties with the responsibility they take (Eryılmaz & Ulusoy, 2015).

Another life and career skill is self-management. Individuals with this skill can use time efficiently and manage their goals well. This skill enables individuals to use their abilities efficiently based on lifelong learning (Kalyoncu, 2012).

Social skills are one of the most important skills. It is a skill that includes behaviors that include cognitive and affective elements, enabling individuals to live and work in harmony with society, to analyze and evaluate social information, and to give an appropriate response. (Eryılmaz and Ulusoy, 2015; Kalyoncu, 2012).

Accounting and productivity skills, on the other hand, are to be responsible for the effectiveness of the product by determining the needs of the individuals in line with the objectives and taking a role in the product creation and product creation process with the work that foresees ethics and cooperation in effective time management (Eryılmaz & Ulusoy, 2015).

Leadership skill, on the other hand, is the ability to gather people around and mobilize people to achieve common interests and goals. In addition, individuals with leadership skills have the characteristics that lead change in education, business world and all other fields, and cope with situations such as stress and loss of motivation. Skills such as using all opportunities effectively and achieving success with people with whom they act together, putting their thoughts into action and reconciling their differences of opinion are the qualities that a good leader should have (P21, 2015).

2.1.5. Measuring 21st Century Skills

Measuring and evaluating 21st century skills is just as important as developing them. The measurement methods used until now are not sufficient for 21st century skills and different measurement and evaluation approaches should be used. Measurement and evaluation approaches such as multiple choice and short answer may not be sufficient in measuring cognitive skills such as group work, leadership or creativity (Kylonen, 2012). Tools including performance evaluation, portfolios, performance evaluations and simulations, situational judgment tests, rating scales and different item types are used to measure 21st century skills (Kylonen, 2012; Soland et al., 2013).

In order to examine the relationship between the measurement and evaluation approaches commonly used in Turkey and the measurement and evaluation approaches commonly used in measuring and evaluating 21st century skills, and to show the important points to be considered when using these approaches, information about all the approaches mentioned is given in the explanations below.

2.1.5.1. Rating Scales

Likert type self-report items are the most commonly used measurement approach to measure 21st century competencies (Soland et al., 2013). Likert type items are mostly used to measure internal and interpersonal skills. Ratings can be made in measurements made with Likert type items (Kylonen, 2012).

As an example of Likert-type measurement, one of the items in the PISA 2012 student questionnaire to determine the perceived control of students' success in mathematics course, "If I make enough effort, I will be successful in mathematics." item was rated as "strongly disagree, disagree, agree, strongly agree". Students respond by choosing the degree that suits them (OECD, 2013).

There are situations that should be considered when using the Likert type measurement approach. The first of these situations is that ratings have different meanings for individuals. This situation makes the interpretation of the results difficult and leads to subjectivity. Anchored rating scales should be used to avoid this situation (Kylonen, 2012).

The second thing to pay attention to is the response style problem (Harzing, 2006; Liu, Lee, & Conrad, 2015; Lu & Bolt, 2015). Anchoring vignette approach is used to solve this problem (Hopkins & Kings, 2010; Kylonen, 2012; OECD, 2014). In the "anchoring vignette" approach, students are first asked to rate the created vignette sets and then the related items. Accordingly, students' reactions to the main items are scaled according to their responses to vignettes (Kylonen & Bertling, 2012; OECD, 2014).

2.1.5.2. Situational Judgment Tests

Situational judgment tests are preferred because they reduce the problems of intercultural comparability and response styles (OECD, 2015). They are tests used when individuals are asked to make a choice (McDaniel, Hartman, Whetzel, & Grubb, 2007).

The most widely used approach to measure individuals' internal skills, group work and communication is situational judgment tests. (Kylonen, 2012). McDaniel and Nguyen (2001) divided situational judgment tests into two categories: knowledge-based and behavioral disposition. Instructions that ask participants to choose the correct or best answer and evaluate the effectiveness of the responses are called knowledge-based response guidelines. Behavioral disposition response guidelines evaluate the participants' possibilities of developing an action.

2.1.5.3. Evaluations and Simulations

Performance appraisal is used to measure participants' reactions to real-life situations. For example, students are asked to make presentations to their teachers in the evaluation of their cooperation and communication performances and their teachers give points for their presentations (Soland et al., 2013). An example of performance evaluation or simulation is the part of PISA that measures collaborative problem solving (OECD, 2017; Soland et al., 2013).

2.1.5.4. Skill and Talent History

The skill and ability history is a collection of activities that provide evidence of students' demonstrated competence and acquired skill. Skill and talent history obtained from social media (Facebook, LinkedIn, Twitter and Google+) is obtained by “big data” scanning technology (Kylonen, 2012). Skill and talent history is used to measure students' life and career skills.

2.1.5.5. Portfolios

Portfolios are used to develop skills such as learning to learn, collaboration, communication and application of knowledge. Student works are evaluated according to the criteria determined in the portfolios (Soland et al., 2013).

2.1.5.6. Applications Containing Different Types of Substances

Multiple choice items are one of the traditional assessment approaches used to measure 21st century skills such as collaboration and critical thinking. In addition, multiple choice items are used in situational judgment tests. Multiple-choice items are used in the "Mission Skills Assessment (MSA)" to measure students' cooperation skills (Soland et al., 2013).

Closed-ended computer-assisted items allow students to choose items or create responses in limited ways, such as moving them on the screen. In this way, closed-ended computer-assisted items reduce chance success in multiple-choice items (Soland et al., 2013). This situation allows decreasing the likelihood of success gained by guessing in multiple-choice items.

Open-ended items are traditionally one of the most widely used measurement approaches. Open-ended items are particularly suitable for measuring non-routine problem solving and creativity among 21st century skills (Soland et al., 2013).

2.2. Digital Literacy

The first researcher to reveal the concept of digital literacy is Paul Gilster. Gilster (1997) stated that digital literacy is a special kind of mindset associated with mastering ideas, not just pressing buttons (Gilster, 1997: 15). Gilster's view is based on three accepted principles of digital literacy:

- Knowledge and ability to access and use various hardware devices and software applications,
- Competence to understand and critically analyze digital content and applications,
- Ability to create with digital technology (Media Awareness Network, 2010).

Based on these principles of Gilster, the European Commission, competencies related to digital literacy; solve problems, communicate, manage information, collaborate, create and share content; knowledge, skills, attitudes (skills, strategies, values) required to use ICT and digital media in an effective, productive, appropriate, critical, creative, autonomous, flexible, ethical manner for work, leisure, participation, learning, socialization, consumption and awareness) (Ferrari, 2013: 3; Murray and Perez, 2014: 86).

Digital literacy has also been defined as “the ability to survive in the digital age” (Eshet-Alkalai, 2004). The indicator of an individual being digitally literate; It is the adaptation to new or emerging technologies (Ng, 2012). Comprehensive definitions of digital literacy, beyond being skills-based, include the process of critical thinking and problem solving encompassing the ability to solve problems effectively in a technology-rich environment.

The term “digital literacy” encompasses five types of literacy:

1. Visual literacy (learning from visuals, visual thinking skills),
2. Reproduction literacy (the ability to reproduce creatively using materials such as text, audio, video, images),
3. Multi-literacy (the use of hypertext in the creation of a non-linear information environment and the ability to freely navigate through the displayed information)
4. Information literacy (critical thinking, ability to search and evaluate information effectively),
5. Socio-emotional literacy (ability to manage the emotional and social aspects of online socialization - avoiding traps, fraud, etc.) (Eshet-Alkalai, 2004)

Young people today interact with tablets, smartphones and e-readers as well as print publications; so they use technology. Technological convergence or convergence makes it

possible for any digital device with a screen (smartphone, tablet, video console, etc.) to share almost any type of content with broad cultural and trans-media influences (Jenkins, 2006). The younger generation reads texts in very different ways from the past, they can manipulate the information they have acquired and produce content. The ability of young people to adopt information and communication technologies (ICT), especially the use of mobile phones and social media technologies, means they have a certain level of digital literacy. Therefore, there is a need to reveal the awareness, competence or inadequacy of young people on digital literacy with evidence. With this research, it is aimed to reveal the level of digital literacy that university students think they have. Consciousness levels can be a step in showing the result of incompatibility or lack of computer communication technologies education.

Today, awareness of the increasing importance of digital literacy and educational institutions have a prominent role in the evaluation and strengthening of these important competencies, but this situation creates a social paradox. Moreover, many employers and educators acknowledge that higher education institutions do not adequately prepare university graduates for digital literacy (Duggan, 2013).

Digital literacy is related to time spent online, knowledge of usage and frequency of use.

2.3. Research on 21st Century Skills and Digital Literacy

In this part of the study, accessible theses and articles on 21st century learner skills and digital literacy levels in both national and international literature are included. The study basically consists of two subjects. The first of these is 21st century learner skills, and the second is digital literacy levels. For this reason, the relevant research section has been divided into the subjects of the study and reported as two sub-titles.

2.3.1. Research on 21st Century Skills

Kalyoncu (2012) with his thesis titled "The Views of Administrators and Teachers on Some Basic Skills that Students Should Have in the Twenty-First Century", aimed to the opinions of teachers and administrators working in private schools and public schools about the skills that students should have in the 21st century and to identify the differences in these two school types. It also aimed to determine whether 307 teachers and administrators constitute the sample of the research. The research was conducted with descriptive method. Data were collected using a two-part questionnaire. As a result of the analysis of the data, it was concluded that the views on 21st century learner skills vary according to the variables of school size, gender, branch and duration of activity.

Gülen (2013), in her thesis titled "An Analysis of Secondary School Students' 21st Century Learning Skills and Information Technologies and Support Levels by Gender and Class Level", aimed to determine how students use 21st century skills and to what extent they benefit from information technologies in this process. In the research, 670 students at secondary school level participated in the research and 58 students were excluded from the study because they left more than half of the measurement tool blank. Scanning method was used in the research. The measurement tool was developed by the researcher. As a result of the analysis of the data; It has been stated that the students' level of 21st century learning skills such as problem solving, active learning, cooperation and communication and learning to learn are good, but the students' level of supporting these skills with information technologies is moderate. In the results of the analysis, it was observed that there was a positive and significant relationship between the students' level of having 21st century learning skills and the level of supporting these skills with information technologies.

Karakaş (2015), in his thesis titled "Measurement of Secondary School Eighth Grade Students' Level of 21st Century Skills for Science", determined that secondary school eighth grade students have 21st century skills for Science course from cognitive, affective and sociocultural dimensions. In the study, it was also examined whether there was a difference according to gender. In the study, in which quantitative and qualitative methods were used together, it was seen that the 21st century skill levels of the students were high as a result of the analysis of the data. When cognitive sub-dimension, affective sub-dimension and socio-cultural sub-dimensions were examined according to gender variable, a significant difference was observed and it was seen that this difference was in favor of female students in all three sub-dimensions.

Çelebi and Sevinç (2019) aimed to determine teachers' perceptions of efficacy and their level of using the 21st century skills in their study. In the analysis of the research, it was stated that there was no significant difference according to gender, branch and seniority variables, but there was a significant difference according to education level. It has been stated that teachers with a bachelor's degree have lower 21st century skills than teachers with a master's degree. A low level of correlation was found between teachers' perceptions of 21st century skills efficacy and their level of using 21st century skills.

In summary; To determine the level of possession and use of 21st century skills by the groups participating in the researches, to determine the measures that can be taken for the acquisition and development of these skills, to plan the teaching process activities, to reveal the views of different groups, especially students and teachers, on 21st century skills. It is seen that it is carried out for purposes such as extraction.

2.3.2. Research on Digital Literacy

Studies in the literature on the realization of literacy using digital technologies show that digital literacy is an important factor in higher education (Özbay & Özdemir, 2014; Prior, Mazanov, Meacheam, Heaslip & Hanson, 2016; Radovanović, Hogan & Lalić, 2015; Tüzel & Tok , 2013). People with digital literacy cognitive skills can solve the digital problems they encounter in the digital age (Sönmez & Gül, 2014).

Öztürk (2020) examined the digital literacy levels of high school students and their families in terms of different variables. A significant difference was determined in the digital literacy levels of the students according to gender and family income level. However, there was no significant difference when analyzed according to school type and age variables. It was determined that the mothers and fathers had a medium level of digital literacy.

Çubukçu and Bayzan (2013) state that digital literacy has become even more important than literacy. Looking at the researches, teachers' knowledge and skills about digital literacy play an important role in education.

In summary, it is seen that the importance of digital literacy studies has increased with the advancement and widespread use of technology in today's world where studies on digital literacy are mostly studied with young people and the digital literacy framework is handled differently.

In this study, the relationship between 21st century learner skills and digital literacy levels of university students was investigated by including 21st century skills determined by various institutions and organizations.

CHAPTER 3: METHOD

In this part of the research, which was conducted to determine the relationship between university students' 21st century learner skills and digital literacy levels, there is information about the research method, study group, data collection tools and data analysis.

3.1. Research Model

In this study, survey model, which is one of the descriptive research methods, was used. In the survey model, it is aimed to collect data to determine the selected characteristics of a group (Büyüköztürk et al., 2008). Relational survey model, which is one of the scanning models, was used in the research.

In this study, data were collected from students who continue their education at the university in the 2020-2021 academic term, and the relationship between 21st century learner skill levels and digital literacy levels was tried to be determined.

A total of 122 students, 81 girls and 41 boys, studying at 19 state and 14 private universities in different provinces of Turkey, participated in this research in the 2020-2021 academic year. Data regarding the study group are given in 3.2.

3.2. Study Group

The data related to the study group of gender, age, university name, department and class level of the university students participating in the research are summarized in the tables given below.

Table 1

Distribution of University Students by Grade Levels

Grade Level	N	%
Preparation	3	2%
1 Grade	40	33%
2 Grade	33	27%
3 Grade	31	25%
4 Grade	15	12%
Total	122	100%

In Table 1, in the distribution of the university students constituting the study group according to their grade levels, it is seen that the students in the preparatory class are the least with 2% and the first year students are the highest with the rate of 33%.

Table 2

Distribution of University Students by Gender

Gender	N	%
Woman	81	66%
Man	41	34%
Total	122	100%

In Table 2, it is seen that the majority of the pre-service teachers constituting the study group are women.

Table 3

Distribution of University Students by Universities

University Name	N	%
Yeditepe University	23	19%
İstanbul Esenyurt University	20	16%
Other Universities	79	65%
Grand Total	122	100%

Table 4

Distribution of the Study Group by University Students by Department

Department Name	N	%
Foreign Trade	13	11%
Cookery	11	9%
Computer and Instructional Technologies Education	8	7%
Public Relations and Advertising	8	7%
Other Departments	82	76%
Grand Total	122	100%

The majority of the university candidates that make up the study group in Table 4 are students of Foreign Trade, Cookery, Computer and Instructional Technologies Education and Public Relations and Advertising departments.

3.3. Data Collection Tools

Two scales were used as data collection tool in the study. These scales are the 21st Century Learner Skills Scale developed by Orhan Göksun (2016) and the Digital Literacy Scale developed by Hamutoğlu et al (2017). Before using it within the scope of this thesis, necessary permissions were obtained by contacting the researchers who developed the scale.

The first scale used in accordance with the purpose of the research is “21. Century Learner Skills Usage Scale. The scale consists of 5-point Likert (1- Strongly disagree, 2- Disagree, 3- Undecided, 4- Agree 5- Completely Agree) type and 31 items. The reliability level of the scale is high. ($\alpha=.98$). The 21st Century Learner Skills Use Scale consists of four sub-dimensions: cognitive skills, autonomous skills, cooperation and flexibility skills, and innovation skills. The reliability levels of the sub-dimensions are cognitive skills ($\alpha=.87$), autonomous skills ($\alpha=.70$), cooperation and flexibility skills ($\alpha=.67$), and innovation skills ($\alpha=.81$).

The Digital Literacy Scale consists of 17 items of 5-likert type (1- I strongly disagree, 2- I do not agree, 3- I am undecided, 4- I agree 5- I completely agree). The reliability level of the scale is high. ($\alpha=.93$). The digital literacy scale consists of four sub-dimensions: attitude, technical, cognitive and social. The reliability levels of the sub-dimensions are attitude ($\alpha=.89$), technical ($\alpha=.90$), cognitive ($\alpha=.87$) and social ($\alpha=.79$).

3.4. Analysis of Data

“SPSS 26.0 Package Program” was used in the analysis of the data, and it was decided which test to use in the analysis of the data, by looking at whether the scales provided the normality assumptions. The university students who participated in the study said “21. It was examined whether the scores they received from the “Century of Use of Learner Skills and Digital Literacy” scales and sub-dimensions were normally distributed. The kurtosis and skewness coefficients of the scales and their sub-dimensions are shown in Table 5 and Table 6.

Table 5

Skewness and Kurtosis Values of the Scales

Scale	Skewness-Kurtosis	Value
21st Century Learner	Skewness	-1,080
Skills Use Scale	Kurtosis	2,568
Digital Literacy Scale	Skewness	-0,948
	Kurtosis	1,470

When Table 5 is examined, it is concluded that the distribution of the kurtosis-skewness values of the scales is normal. Therefore, it can be said that it is appropriate to use parametric tests in the analysis of data.

Table 6

Skewness and Kurtosis Values of the Sub-Dimensions of the Scales

Scale	Sub-Dimensions	Skewness	Kurtosis
21st Century Learner Skills Scale	Cognitive Skills	-1,746	4,671
	Autonomous Skills	-0,189	-0,338
	Collaboration and Flexibility Skills	-0,330	-0,385
	Innovation Skills	-0,739	0,000
	Attitude	-0,781	0,688
Digital Literacy Scale	Technical	-1,082	1,381
	Cognitive	-0,939	0,249
	Social	-0,714	0,089

When Table 6 is examined, it has been concluded that the distribution of kurtosis-skewness values of the sub-dimensions of the scales is normal. Therefore, it can be said that

it is appropriate to use parametric tests in the analysis of data. Therefore, it is appropriate to use parametric tests in the analysis of data related to sub-dimensions.

3.5. Reliability Analysis of the Study

Table 7

Reliability Coefficients of the 21st Century Learner Skills Scale and its Sub-Dimensions and the Digital Literacy Scale and its Sub-Dimensions

Scale	Sub-Dimensions	Number of Items	Cronbach alfa katsayısı
21st Century Learner Skills Scale	Cognitive Skills	17 Items	0,94
	Autonomous Skills	6 Items	0,79
	Collaboration and Flexibility Skills	6 Items	0,81
	Innovation Skills	2 Items	0,84
	Attitude	7 Items	0,87
Digital Literacy Scale	Technical	6 Items	0,91
	Cognitive	2 Items	0,85
	Social	2 Items	0,69

As seen in Table 7, Cronbach's alpha reliability coefficients for the 4 sub-dimensions of the 21st century learner scale ranged from 0.81 to 0.95, while the reliability coefficient for the whole scale was 0.95. Cronbach's alpha reliability coefficients for the 4 sub-dimensions of the digital literacy scale ranged from 0.69 to 0.91, while the reliability coefficient for the whole scale was 0.94.

CHAPTER 4: FINDINGS AND COMMENT

In this part of the research, the main problem of the research and the findings related to the related sub-problems are explained respectively.

4.1. Findings and Interpretation on the First Sub-Problem

The first sub-problem of the study was structured as the scale scores of university students' levels of using 21st century learner skills. Accordingly, the results obtained are explained in Table 8.

Table 8

Descriptive Statistics of University Students' Levels of Use of 21st Century Learner Skills

University Students' Levels of Use of 21st Century Learner Skills	Number of Students	Min	Max	Mean (\bar{X})	Standard Deviation
Total	122	13	124	89,94	20,593

When Table 8 is examined; While the highest score that can be obtained from the 21st century learner skills scale is 124, it is seen that the mean score of the university students participating in the study from the total scale is ($\bar{x} = 89.94$), and the standard deviation is ($S_s = 20.53$). According to these findings, it can be said that the general average of the 21st century learner skills usage levels of university students is high.

Findings related to the sub-dimensions of the 21st century learner skills scale are given in Table 9.

Table 9

Descriptive Statistics of the Sub-Dimensions of the 21st Century Learner Skills Scale of University Students

Sub-Dimensions of 21st Century Learner Skills	Number of Students	Min	Max	Mean	Standard Deviation
Cognitive Skills	122	5	68	53,61	11,681
Autonomous Skills	122	3	24	15,25	4,661
Collaboration and Flexibility Skills	122	2	24	15,18	5,099
Innovation Skills	122	0	8	5,90	1,900
Total	122	13	124	89,94	20,593

When Table 9 is examined, when the sub-dimensions of the 21st century learner skills scale are evaluated; While the highest scores that can be obtained from the cognitive skills, autonomous skills, cooperation and flexibility skills, and innovative skills sub-dimensions are max=68 and min=24, respectively, the average of the scores of the university students participating in the research from the expressed sub-dimensions of the scale is $\bar{x} = 89.94$; It is seen that $\bar{x} = 53.61$ and $\bar{x} = 15.5$. When the total scores of the scale are evaluated, it is seen that the highest score that can be obtained is max=124, while the mean score is $\bar{x} = 89.94$. When these findings are examined, it can be said that university students have a high level of cognitive skills, one of the sub-dimensions of the scale.

4.2. Findings and Interpretation on the Second Sub-Problem

In the second sub-problem of the research, the level of using 21st century learner skills and digital literacy levels of university students; The answer is sought whether it changes according to gender, department and grade level.

Table 10 shows the t-test results of university students regarding this sub-problem, whether their scores on the 21st century learner skills scale and digital literacy scale change according to gender.

Table 10

T-Test Results Regarding the Scores of University Students from the 21st Century Learner Skills Scale and the Digital Literacy Scale by Gender Variable

Scale	Gender	N	\bar{X}	S. D	T	P
21st Century Learner Skills Scale	Woman	81	90,80	18,714	0,647	0,301
	Man	41	88,24	24,039		
Digital Literacy Scale	Woman	81	51,35	11,265	-1,088	0,723
	Man	41	53,76	12,132		

When Table 10 is examined, it is seen that the mean level of using 21st century learner skills of female students ($\bar{x}=90.80$) and the average level of using 21st century learner skills of male students ($\bar{x}=88.24$). As a result of the comparison of the levels of use of 21st century learner skills, there does not appear to be a significant difference in the average scores of male and female students. It is seen that the mean of digital literacy levels of female students ($\bar{x}=51.35$) and the average of digital literacy levels of male students ($\bar{x}=53.76$). As a result of the comparison of digital literacy use levels, there does not appear to be a significant difference in the average scores of male and female students. In other words, there is no significant gender difference between university students' levels of using 21st century learner skills and their digital literacy levels.

Table 11

T-Test Results Regarding the Scores of University Students from the 21st Century Learner Skills Scale and the Sub-Dimensions of the Digital Literacy Scale by Gender Variable

Scale	Sub-Dimensions	Gender	N	\bar{X}	S. D	T	P
21st Century Learner Skills Scale	Cognitive Skills	Woman	81	54,16	10,316	1,648	0,137
		Man	41	52,51	14,073		
	Autonomous Skills	Woman	81	15,06	4,613	-0,572	0,445
		Man	41	15,63	4,789		
	Collaboration and Flexibility Skills	Woman	81	15,73	4,342	1,631	0,001*
		Man	41	14,10	6,256		
Innovation Skills	Woman	81	5,85	1,905	-0,148	0,773	
	Man	41	6,00	1,910			
Digital Literacy Scale	Attitude	Woman	81	21,16	4,908	-0,327	0,423
		Man	41	21,49	5,437		
	Technical	Woman	81	18,53	4,484	-1,445	0,881
		Man	41	19,98	4,321		
	Cognitive	Woman	81	5,99	1,736	-0,281	0,708
		Man	41	6,27	1,817		
Social	Woman	81	5,67	1,768	-0,358	0,968	
	Man	41	6,02	1,810			

* $p < 0,05$

In Table 11, there is no significant difference between the averages of the 21st century learner skills sub-dimensions of the 21st century learner skills scale of university students according to the gender variable, while there is a significant difference between the average of the cooperation and flexibility skills sub-dimension between male and female students ($t(122) = 1.631$; $p < 0.05$). The mean score of the cooperation and flexibility skills sub-dimension of female university students ($\bar{x}=15.73$) is higher than the average score of men

(\bar{x} =14.10). Accordingly, the gender variable is seen as a significant variable on the "collaboration and flexibility skills" sub-dimension of the 21st century learner skills scale in favor of female university students. According to the gender variable, there is no significant difference between the attitude, technical, cognitive and social sub-dimensions of the digital literacy scale of university students according to gender.

Table 12

Descriptive Statistics of University Students' Scores from 21st Century Learner Skills and Digital Literacy Scales by Department Variable

Scale	Department	N	\bar{X}	S. S
21st Century Learner Skills Scale	Foreign Trade	13	101,92	13,345
	Cookery	11	86,91	30,645
	Computer and Instructional Technologies Education	8	99,75	18,568
	Public Relations and Advertising	8	93,75	10,195
	Others	82	87,12	20,226
	Digital Literacy Scale	Foreign Trade	13	61,15
Cookery		11	55,64	10,567
Computer and Instructional Technologies Education		8	55,00	8,976
Public Relations and Advertising		8	53,25	11,634
Others		82	49,88	11,767

According to Table 12, the average scores of the 21st century learner skills of university students according to the department variable are \bar{x} = 101.92 for Foreign Trade, \bar{x} = 86.91 for Cookery, \bar{x} = 99.75 for Computer And Instructional Technologies Education, \bar{x} = for Public Relations and Advertising. 93.75, for other sections \bar{x} = 87.12. The average scores of the

university students' digital literacy levels according to the department variable are \bar{x} = 61.15 for Foreign Trade, \bar{x} = 55.64 for Cookery, \bar{x} = 55.00 for COMPUTER AND INSTRUCTIONAL TECHNOLOGIES EDUCATION, \bar{x} = 53.25 for Public Relations and Advertising, other departments for \bar{x} =49.88.

Table 13

ANOVA Results of the Scores of University Students from the 21st Century Learner Skills Scale and the Digital Literacy Scale by Department Variable

Scale	Source of Variance	Sum of Squares	F	p
21st Century Learner Skills Scale	Intergroup	3,504	2,145	0,080
	Ingroups	4,780		
	Total	5,131		
Digital Literacy Scale	Intergroup	1,685	3,397	0,11
	Ingroups	1,451		
	Total	1,619		

According to Table 13, there is no significant difference between the average scores of university students regarding 21st century learner skills and digital literacy levels according to the department variable.

Table 14

ANOVA Results of 21st Century Learner Skills and Digital Literacy Scales Scores of University Students by Grade Level

Scale	Source of Variance	Sum of Squares	F	p
21st Century Learner Skills Scale	Intergroup	0,561	0,323	0,862
	Ingroups	5,074		
	Total	5,131		
Digital Literacy Scale	Intergroup	2,073	4,294	0,003
	Ingroups	1,412		
	Total	1,619		

According to Table 14, there is no significant difference between the average scores of university students regarding 21st century learner skills and digital literacy levels according to the grade level variable.

4.3. Findings and Interpretation on the Third Sub-Problem

In the third sub-problem of the research, an answer is sought for the existing digital literacy levels of university students.

Table 15

Descriptive Statistics of University Students' Digital Literacy Levels

Digital Levels	Literacy	Number of Students	Min	Max	Mean (\bar{X})	Standard Deviation
Total		122	15	68	52,16	11,570

When Table 15 is examined; While the highest score that can be obtained from the digital literacy scale is $\max=68$, it is seen that the average score of the university students participating in the research from the total scale is $\bar{x}= 52.16$. According to these findings, it can be said that the digital literacy levels of university students are generally positive.

Table 16

Descriptive Statistics of University Students' Digital Literacy Levels Sub-Dimensions

Digital Literacy Scale Sub-Dimensions	Min	Max	Mean (\bar{X})	Standard Deviation
Attitude	6	28	21,27	5,071
Technical	4	24	19,02	4,465
Cognitive	1	8	6,08	1,761
Social	1	8	5,79	1,783
Total	15	68	52,16	11,570

When Table 16 is analyzed and the digital literacy scale sub-dimensions of university students are evaluated; While the highest scores that can be obtained from the sub-dimensions of attitude, technique, cognitive and social are $\max=28$ and $\max=24$, respectively, the average of the scores obtained by the university students participating in the research from the sub-dimensions expressed in the scale is $\bar{x}= 52.16$; It is seen that $\bar{x}= 21.27$ and $\bar{x}= 19.02$. When the total scores of the scale are evaluated, it is seen that the highest score that can be obtained is $\max=68$, while the mean score is $\bar{x}= 52.16$. When these findings are examined, it can be said that university students have a high level of digital literacy both in the sub-dimensions of the scale and in the whole scale.

4.4. Findings and Interpretation on the Fourth Sub-Problem

The fourth sub-problem of the study is to determine the relationship between the sub-dimensions of the 21st century learner skills scale of university students and the sub-dimensions of the digital literacy scale. Accordingly, the correlation analysis results of the relationship between the 21st century learner skills of university students and their digital literacy levels are given in Table 17.

Table 17

The Relationship Between 21st Century Learner Skills and Digital Literacy Levels of University Students

		21st Century Learner Skills	Digital Literacy
21st Century Learner Skills	Pearson Correlation	1	,498**
	Meaningfulness		,000
	N	122	122
Digital Literacy	Pearson Correlation	,498**	1
	Meaningfulness	,000	
	N	122	122

When Table 17 is examined , it is seen that there is a moderate, positive and significant relationship between 21st century learner skills and digital literacy levels ($r=,498$; $p<0.01$). As the 21st century learner skills of university students increase, their digital literacy levels also increase.

Table 18

Correlation Analysis Results of the Relationship Between the Cognitive Skills Sub-Dimension and the Attitude Sub-Dimension of University Students

		Cognitive Skills	Attitude
Cognitive Skills	Pearson Correlation	1	,444**
	Meaningfulness		,000
	N	122	122
Attitude	Pearson Correlation	,444**	1
	Meaningfulness	,000	
	N	122	122

In Table 18, the relationship between cognitive skills, which is one of the sub-dimensions of the 21st century learner skills scale, and attitude, which is one of the sub-dimensions of the digital literacy scale, is examined. Since the probability value is less than 0.05 (0.000) between the two subtitles, it is seen that there is a significant relationship at the $p < .05$ level. The relationship has a positive correlation.

Table 19

Correlation Analysis Results on the Relationship Between the Cognitive Skills Sub-Dimension and the Technical Sub-Dimension of University Students

		Cognitive Skills	Technical
Cognitive Skills	Pearson Correlation	1	,395**
	Meaningfulness		,000
	N	122	122
Technical	Pearson Correlation	,395**	1
	Meaningfulness	,000	
	N	122	122

In Table 19, it is seen that the relationship between cognitive skills, which is one of the sub-dimensions of the 21st century learner skills scale, and technique, which is one of the sub-dimensions of the digital literacy scale, is low, positive and significant ($r=,395;p<0.01$).

Table 20

Correlation Analysis Results on the Relationship Between Cognitive Skills and Cognitive Sub-Dimensions of University Students

		Cognitive Skills	Cognitive
Cognitive Skills	Pearson Correlation	1	,344**
	Meaningfulness		,000
	N	122	122
Cognitive	Pearson Correlation	,344**	1
	Meaningfulness	,000	
	N	122	122

Table 20 shows that the relationship between cognitive skills, one of the sub-dimensions of the 21st century learner skills scale, and cognitive, one of the sub-dimensions of the digital literacy scale, is low, positive and significant ($r=,344;p<0.01$).

Table 21

Correlation Analysis Results of the Relationship Between the Cognitive Skills Sub-Dimension and the Social Sub-Dimension of University Students

		Cognitive Skills	Social
Cognitive Skills	Pearson Correlation	1	,338**
	Meaningfulness		,000
	N	122	122
Social	Pearson Correlation	,338**	1
	Meaningfulness	,000	
	N	122	122

In Table 21, it is seen that the relationship between cognitive skills, one of the sub-dimensions of the 21st century learner skills scale, and social, one of the sub-dimensions of the digital literacy scale, is low, positive and significant ($r=,338;p<0.01$).

Table 22

Correlation Analysis Results of University Students' Relationship Between Autonomous Skills Sub-Dimension and Attitude Sub-Dimension

		Autonomous Skills	Attitude
Autonomous Skills	Pearson Correlation	1	,344**
	Meaningfulness		,000
	N	122	122
Attitude	Pearson Correlation	,344**	1
	Meaningfulness	,000	
	N	122	122

In Table 22, the relationship between autonomous skills, which is one of the sub-dimensions of the 21st century learner skills scale, and attitude, which is one of the sub-dimensions of the digital literacy scale, is examined. Since the probability value is less than 0.05 (0.000) between the two subtitles, it is seen that there is a significant relationship at the $p<.05$ level. The relationship has a positive correlation.

Table 23

Correlation Analysis Results on the Relationship Between the Autonomous Skills Sub-Dimension and the Technical Sub-Dimension of University Students

		Autonomous Skills	Technical
Autonomous Skills	Pearson Correlation	1	,379**
	Meaningfulness		,000
	N	122	122
Technical	Pearson Correlation	,379**	1
	Meaningfulness	,000	
	N	122	122

In Table 23, the relationship between autonomous skills, one of the sub-dimensions of the 21st century learner skills scale, and technique, one of the sub-dimensions of the digital literacy scale, is examined. Since the probability value is less than 0.05 (0.000) between the two subtitles, it is seen that there is a significant relationship at the $p < .05$ level. The relationship has a positive correlation.

Table 24

Correlation Analysis Results of University Students' Relationship Between Autonomous Skills Sub-Dimension and Cognitive Sub-Dimension

		Autonomous Skills	Cognitive
Autonomous Skills	Pearson Correlation	1	,218**
	Meaningfulness		,016
	N	122	122
Cognitive	Pearson Correlation	,218**	1
	Meaningfulness	,016	
	N	122	122

Table 24 shows that the relationship between autonomous skills, one of the sub-dimensions of the 21st century learner skills scale, and cognitive, one of the sub-dimensions of the digital literacy scale, is low, positive and significant ($r=.218;p<0.01$).

Table 25

Correlation Analysis Results of University Students' Relationship Between Autonomous Skills Sub-Dimension and Social Sub-Dimension

		Autonomous Skills	Social
Autonomous Skills	Pearson Correlation	1	,303**
	Meaningfulness		,001
	N	122	122
Social	Pearson Correlation	,303**	1
	Meaningfulness	,001	
	N	122	122

Table 25 examines the relationship between autonomous skills, one of the sub-dimensions of the 21st century learner skills scale, and social, one of the sub-dimensions of the digital literacy scale. Since the probability value was less than 0.05 (0.001) between the two subtitles, it is seen that there is a significant relationship at the $p<.05$ level. The relationship has a positive correlation.

Table 26

Correlation Analysis Results on the Relationship Between the Collaboration and Flexibility Skills Sub-Dimension of University Students and the Attitude Sub-Dimension

		Collaboration and Flexibility Skills	Attitude
Collaboration and Flexibility Skills	Pearson Correlation	1	,432**
	Meaningfulness		,000
	N	122	122
Attitude	Pearson Correlation	,432**	1
	Meaningfulness	,000	
	N	122	122

In Table 26, it is seen that the relationship between cooperation and flexibility skills, one of the sub-dimensions of the 21st century learner skills scale, and attitude, which is one of the sub-dimensions of the digital literacy scale, is moderate, positive and significant ($r=,432;p<0.01$).

Table 27

Correlation Analysis Results on the Relationship Between the Collaboration and Flexibility Skills Sub-Dimension of University Students and the Technical Sub-Dimension

		Collaboration and Flexibility Skills	Technical
Collaboration and Flexibility Skills	Pearson Correlation	1	,367**
	Meaningfulness		,000
	N	122	122
Technical	Pearson Correlation	,367**	1
	Meaningfulness	,000	
	N	122	122

In Table 27, the relationship between cooperation and flexibility skills, one of the sub-dimensions of the 21st century learner skills scale, and technique, one of the sub-dimensions of the digital literacy scale, is examined. Since the probability value is less than 0.05 (0.000) between the two subtitles, it is seen that there is a significant relationship at the $p < .05$ level. The relationship has a positive correlation.

Table 28

Correlation Analysis Results of the Relationship Between the Collaboration and Flexibility Skills Sub-Dimension of University Students and the Cognitive Sub-Dimension

		Collaboration and Flexibility Skills	Cognitive
Collaboration and Flexibility Skills	Pearson Correlation	1	,347**
	Meaningfulness		,000
	N	122	122
Cognitive	Pearson Correlation	,347**	1
	Meaningfulness	,000	
	N	122	122

In Table 28, the relationship between cooperation and flexibility skills, one of the sub-dimensions of the 21st century learner skills scale, and cognitive, one of the sub-dimensions of the digital literacy scale, is examined. Since the probability value is less than 0.05 (0.000) between the two subtitles, it is seen that there is a significant relationship at the $p < .05$ level. The relationship has a positive correlation.

Table 29

Correlation Analysis Results on the Relationship Between the Collaboration and Flexibility Skills Sub-Dimension of University Students and the Social Sub-Dimension

		Collaboration and Flexibility Skills	Social
Collaboration and Flexibility Skills	Pearson Correlation	1	,433**
	Meaningfulness		,000
	N	122	122
Social	Pearson Correlation	,433**	1
	Meaningfulness	,000	
	N	122	122

In Table 29, the relationship between cooperation and flexibility skills, one of the sub-dimensions of the 21st century learner skills scale, and social, one of the sub-dimensions of the digital literacy scale, is examined. Since the probability value is less than 0.05 (0.000) between the two subtitles, it is seen that there is a significant relationship at the $p < .05$ level. The relationship has a positive correlation.

Table 30

Correlation Analysis Results on the Relationship Between the Innovation Skills Sub-Dimension and the Attitude Sub-Dimension of University Students

		Innovation Skills	Attitude
Innovation Skills	Pearson Correlation	1	,433**
	Meaningfulness		,000
	N	122	122
Attitude	Pearson Correlation	,433**	1
	Meaningfulness	,000	
	N	122	122

In Table 30, the relationship between innovative skills, which is one of the sub-dimensions of the 21st century learner skills scale, and attitude, which is one of the sub-dimensions of the digital literacy scale, is examined. Since the probability value is less than 0.05 (0.000) between the two subtitles, it is seen that there is a significant relationship at the $p < .05$ level. The relationship has a positive correlation.

Table 31

Correlation Analysis Results on the Relationship Between the Innovation Skills Sub-Dimension and the Technical Sub-Dimension of University Students

		Innovation Skills	Technical
Innovation Skills	Pearson Correlation	1	,438**
	Meaningfulness		,000
	N	122	122
Technical	Pearson Correlation	,438**	1
	Meaningfulness	,000	
	N	122	122

In Table 31, the relationship between innovation skills, which is one of the sub-dimensions of the 21st century learner skills scale, and technique, which is one of the sub-dimensions of the digital literacy scale, is examined. Since the probability value is less than 0.05 (0.000) between the two subtitles, it is seen that there is a significant relationship at the $p < .05$ level. The relationship has a positive correlation.

Table 32

Correlation Analysis Results of the Relationship Between the Innovation Skills Sub-Dimension and Cognitive Sub-Dimension of University Students

		Innovation Skills	Cognitive
Innovation Skills	Pearson Correlation	1	,400**
	Meaningfulness		,000
	N	122	122
Cognitive	Pearson Correlation	,400**	1
	Meaningfulness	,000	
	N	122	122

In Table 32, the relationship between innovation skills, which is one of the sub-dimensions of the 21st century learner skills scale, and cognitive, one of the sub-headings of the digital literacy scale, is examined. Since the probability value is less than 0.05 (0.000) between the two subtitles, it is seen that there is a significant relationship at the $p < .05$ level. The relationship has a positive correlation.

Table 33

Correlation Analysis Results on the Relationship Between the Innovation Skills Sub-Dimension and the Social Sub-Dimension of University Students

		Innovation Skills	Social
Innovation Skills	Pearson Correlation	1	,426**
	Meaningfulness		,000
	N	122	122
Social	Pearson Correlation	,426**	1
	Meaningfulness	,000	
	N	122	122

In Table 33, the relationship between innovation skills, which is one of the sub-dimensions of the 21st century learner skills scale, and social, which is one of the sub-dimensions of the digital literacy scale, is examined. Since the probability value is less than 0.05 (0.000) between the two subtitles, it is seen that there is a significant relationship at the $p < .05$ level. The relationship has a positive correlation.



CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

The aim of this study is to determine the 21st century learner skill levels and digital literacy levels of university students and to examine the relationship between them in terms of different type of variables. In this section, the results related to the findings reached in accordance with the purpose of the research, the discussions on the similar and different aspects of the previous studies based on these results, and suggestions for possible future studies in the similar field are given.

The first sub-problem of the study was structured as the scale scores of university students' levels of using 21st century learner skills. When the findings are examined; While the highest score that can be obtained from the 21st century learner skills scale is 124, it is seen that the university students who participated in the research got the mean score from the total scale ($\bar{x} = 89.94$). According to these findings, it can be said that the general average of the 21st century learner skills usage levels of university students is high. Alkoç (2020) found that pre-service teachers use 21st century learner skills at a moderate level in the findings of his thesis titled "Examination of the Relationship Between 21st Century Learner Skills and Critical Thinking Tendencies of Pre-School Teachers".

When the sub-dimensions of the 21st century learner skills scale are evaluated; While the highest scores that can be obtained from the cognitive skills, autonomous skills, cooperation and flexibility skills, and innovative skills sub-dimensions are $\max=68$ and $\min=24$, respectively, the average of the scores of the university students participating in the research from the expressed sub-dimensions of the scale is $\bar{x} = 89.94$; It is seen that $\bar{x} = 53.61$ and $\bar{x} = 15.5$. When these findings are examined, it can be said that university students have a high level of cognitive skills, one of the sub-dimensions of the scale. In his study with 8th

grade students in Karakaş (2015), he concluded that students have a high level of cognitive, affective and sociocultural dimensions of 21st century skills. This may be due to the parallelism between the skills included in the 21st century skills and the skills included in the curriculum.

In the second sub-problem of the study, it was determined that university students' levels of using 21st century learner skills and digital literacy levels; The answer is sought whether it changes according to gender, department and grade level. According to the t-test results of university students regarding this sub-problem, whether their scores from the 21st century learner skills scale and the digital literacy scale differ according to gender, there does not appear to be a significant difference in the mean scores of female and male students. In other words, there is no significant gender difference between university students' levels of using 21st century learner skills and their digital literacy levels. Noise, Aslan, and Alcı (2018) examined the 21st century competencies of primary school teachers by gender and it was found that there was no significant difference. Korkmaz (2019) and Kıyasoğlu (2019) aimed to analyze the 21st century teaching skills of classroom teachers with their studies and no significant difference was observed according to gender. In the studies conducted by Çelebi, Sevinç (2019) and Eğmir, Çengelci (2020), there was no significant difference according to gender in the study on teachers' perceptions of efficacy regarding 21st century skills.

According to the gender variable, there is no significant difference between the averages of the 21st century learner skills scale cognitive skills, autonomous skills and innovation skills of university students, while there is a significant difference between the average of the cooperation and flexibility skills sub-dimension between female and male students ($t(122) = 1.631; p < 0.05$). The mean score of the cooperation and flexibility skills sub-dimension of female university students ($\bar{x}=15.73$) is higher than the average score of men

($\bar{x}=14.10$). Accordingly, the gender variable is seen as a significant variable on the "collaboration and flexibility skills" sub-dimension of the 21st century learner skills scale in favor of female university students. According to the gender variable, there is no significant difference between the attitude, technical, cognitive and social sub-dimensions of the digital literacy scale of university students according to gender. When the literature is examined, in the study conducted by Peker (2019), when the levels of 21st century learner skills use of social studies teacher candidates are examined according to the gender variable; It is seen that there is no significant difference in the cognitive skills, cooperation and flexibility skills, and innovative skills sub-dimensions of the scale and the total scores of learner skills. However, it is seen that there is a significant difference in favor of male teacher candidates in the autonomous skills sub-dimension of the scale. According to this, it can be said that male teacher candidates use their autonomous skills (self-management, self-control and ability to work individually or in groups) more than female teacher candidates.

In Demirdağ's (2021) study, no significant difference was found in the level of digital literacy according to the gender variable, but a significant difference was observed in the mean scores of women in the sub-dimensions of the scale, in attitude and cognitive dimensions, and in the mean scores of men in the technical and social dimensions. In Arslan's (2019) study, no significant difference was found in the digital literacy proficiency levels of teachers according to the gender variable. This finding is consistent with the study conducted by Kozan and Özek (2019) with students from the department of information technology teaching.

There is no significant difference between the average scores of 21st century learner skills and digital literacy levels of university students according to the variables of department and grade level. In the study carried out by Kozan (2018), "There is a significant

difference between the digital literacy levels of the information technology teacher candidates according to their grade levels. The digital literacy level of the 3rd grade students is significantly different from the digital literacy level of the 2nd grade students. The digital literacy level of the 3rd grade students is significantly different from the digital literacy level of the 4th grade students. The digital literacy level of the 3rd grade students is higher than the digital literacy level of both 2nd and 4th grade students.

Arslan (2019) found significant differences in digital literacy levels of teachers according to the branch variable, together with the factors; concluded that the level of informatics, mathematics and science teachers is higher than the others. Ustundag et al. (2017) concluded that the digital literacy levels of the science department educators are good.

In the third sub-problem of the research, an answer is sought for the existing digital literacy levels of university students. When the findings are examined, it can be said that the digital literacy levels of university students are high both in the sub-dimensions of the scale and in the whole scale. In his study, Anisimova (2020) evaluated the answers given by the teachers and stated that their digital literacy levels were high. According to the results of the research, it was seen that the digital literacy levels of the classroom teachers were quite high in the sub-dimensions of attitude, technique, cognitive and social. It can be thought that the reasons for this result are that teachers keep up with the changing and developing technology and education systems, follow the developments closely because they are together with the new generation due to their profession, and develop themselves in order to educate students as individuals who can adapt to the time they are in and can distinguish the accuracy and falsehood of the information obtained with technology. .

The fourth sub-problem of the study is to determine the relationship between the sub-dimensions of the 21st century learner skills scale of university students and the sub-

dimensions of the digital literacy scale. Correlation analysis results on the relationship between university students' 21st century learner skills and digital literacy levels were examined. When the findings are examined, it is seen that there is a moderate, positive and significant relationship between 21st century learner skills and digital literacy levels ($r=.498$; $p<0.01$). As the 21st century learner skills of university students increase, their digital literacy levels also increase. Özer (2021), examined whether there is a relationship between classroom teachers' perceptions of 21st century skills proficiency and their digital literacy levels, and it was seen that there was a moderate, positive and significant relationship. The digital literacy levels of teachers who have a high perception of 21st century skills competence are also increasing.

Cognitive skills ($r=.444$; $p<0.01$), which are sub-dimensions of the 21st century learner skills scale, and cooperation and flexibility skills ($r=.432$; $p<0.01$), which are one of the sub-dimensions of the digital literacy scale. It is seen that the relations between attitudes and attitudes are moderate, positive and significant. Özer (2021), it was seen that the variable that most predicts the attitude sub-dimension of digital literacy is knowledge, media and technology skills, the variable that most predicts the technical and social sub-dimension is learning and renewal skills, and the variable that most predicts the cognitive sub-dimension is life and career skills.

5.1. Suggestions for Curriculum and Instruction

The the study has important findings that can be used in the development of new curricula in a qualified way. As a result of the study, suggestions for curriculum and instruction and turkish higher education were developed.

The beginning of the digital age after the growth and development in technology is accepted as the 21st century (Beers, 2011). New technologies and tools that become a part of our daily lives are constantly changing and developing. The characteristics that individuals are expected to have in their business life in the 20th century are changing with the 21st century (Dede 2009; Wagner, 2008a). In the 21st century, individuals need to adapt to development and changes, use the acquired knowledge, be productive and have the skills needed. The skills that individuals should have are called 21st century skills (Dede, 2009).

Skills that enable individuals to continue their lives and adapt to society, called 21st century skills, are gained through education. In all educational processes from primary school to university, 21st century skills should be gained through education (Tutkun, 2010).

21st century skills are skills that need to be developed in students and these skills can be transferred to students through education and training programs. For this reason, curricula are in an important position.

In line with the results of this study, some suggestions are given to the researchers. The first of these suggestions is to prioritize 21st century skills in the curriculum preparation process. Different studies can be conducted on the application of 21st century skills. Considering that all components of the curricula are related to each other, consistent curricula should be prepared in order to cover all 21st century skills.

A total of 122 students, 81 girls and 41 boys, studying at 19 state and 14 private universities in different provinces of Turkey, participated in this research in the 2020-2021 academic year. Similar studies can be carried out by applying it to primary, secondary, high school and university students in different provinces.

In addition to these suggestions, new content should be added to the education programs for the needs of the current age or changes should not be made in the existing content. Considering that students are very intertwined with technology, courses on digital literacy can be added to the curriculum. Finally, 21st century skills should be developed by giving more space to interdisciplinary studies in education programs.

5.2. Recommendations for the Turkish Higher Education System

- Activities to support the development of 21st century skills of university students can be carried out.
- Teaching staff can be trained on 21st century skills that university students should have.
- Classes should be supported to develop students' 21st century skills with activities such as group and individual work and research assignments.
- In order to develop 21st century skills, students should be at the center of the lessons.
- In order to develop 21st century skills such as digital literacy, information and technology literacy, critical thinking and problem solving of university students, technology-supported lessons should be conducted using techniques such as learning by doing, experiencing and active learning.
- In order for students to gain these skills, instructors should be supported with in-service training.
- University students can receive training on these skills during their undergraduate education to increase their 21st century learner skills and digital literacy levels.

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Appendix 1: 21st Century Learner Skills Scale

Maddeler	Hiçbir Zaman	Nadiren	Ara sıra	Genellikle	Her zaman
1. Toplumsal konulara duyarlı davranırım.	1	2	3	4	5
2. Dikkatimi çeken konularda araştırma yaparım.	1	2	3	4	5
3. Yeni araştırma fikirleri geliştiririm.	1	2	3	4	5
4. Öğrenme topluluklarında gerçekleşen fikir alışverişlerine katkıda bulunurum.	1	2	3	4	5
5. Kişisel ilgi ve ihtiyaçlarıma en uygun olan kaynakları seçerim.	1	2	3	4	5
6. İlgi alanlarıma uygun bilgiler arasında bağlantı kurarım.	1	2	3	4	5
7. Sorularıma yanıt buluncaya kadar araştırma yapmaya devam ederim.	1	2	3	4	5
8. İlgi alanlarımda neler olduğunun farkındayım.	1	2	3	4	5
9. Edindiğim bilgilerin günlük yaşamımda işe yaraması için çaba sarf ederim.	1	2	3	4	5
10. Bir yargıya varmak için eleştirel düşünme becerilerimi işe koşarım.	1	2	3	4	5
11. Arkadaşlarımda fikirlerini sonuna kadar dinlerim.	1	2	3	4	5
12. Bir konuyla ilgili bilgi düzeyimin sınırlarını bilirim.	1	2	3	4	5
13. Fakülte'deki laboratuvarları/atölyeleri ders dışında da kullanırım.	1	2	3	4	5
14. Derslerde yapılan etkinliklerin çeşitlendirilmesini isterim.	1	2	3	4	5
15. Derslerde işbirliğine dayalı etkinliklere katılırım.	1	2	3	4	5
16. Öğrenci topluluklarında (bilgisayar, tiyatro, halk dansları kulüpleri gibi) aktif olarak çalışırım.	1	2	3	4	5
17. Herhangi bir konuda diğerlerinin düşündüğünden daha farklı düşünürüm.	1	2	3	4	5
18. Karşılaştığım sorunları tek başıma çözerim.	1	2	3	4	5
19. Günlük yaşamımda yeni teknolojiler kullanırım.	1	2	3	4	5
20. Öğrenme süreçlerimde yeni teknolojilerden yararlanırım.	1	2	3	4	5
21. Öğrendiğim bir konuda neden-sonuç ilişkilerini keşfederim.	1	2	3	4	5
22. Aradığım bilgiye nasıl erişeceğimi bilirim.	1	2	3	4	5
23. Eriştiğim bilgilerin başka bir bakış açısıyla oluşturulduğunu bilirim.	1	2	3	4	5
24. Farklı biçimlerde ödev hazırlarım.	1	2	3	4	5
25. Çalışmalarımı aldığım dönütlere göre yeniden düzenlerim.	1	2	3	4	5
26. Grup çalışmalarında bana düşen görevi gruptan bağımsız olarak yapmayı tercih ederim.	1	2	3	4	5
27. Grup çalışmalarında grup liderliği yaparım.	1	2	3	4	5
28. İlgi alanlarıma uygun fırsatları değerlendiririm.	1	2	3	4	5
29. Öğrendiklerimi karşılaştığım başka problemlerin çözümünde kullanırım.	1	2	3	4	5
30. Önemli kararları tek başıma alırım.	1	2	3	4	5
31. Öğrendiklerimi uygulamaya gerek kalmadan zihnimde canlandırırım.	1	2	3	4	5

Appendix 2: Digital Literacy Scale

	Kesinlikle Katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle Katılıyorum
Öğrenme sürecinde Bilgi ve iletişim teknolojilerini kullanmak hoşuma gider.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bilgi ve iletişim teknolojilerini kullanarak daha iyi öğrenirim.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bilgi ve iletişim teknolojilerini kullanarak öğrenmek daha ilgi çekicidir.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bilgi ve iletişim teknolojilerini kullanarak öğrenmek beni daha motive eder.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Öğrenme etkinliklerim için arkadaşlarımdan sıklıkla İnternet aracılığıyla (Skype, Face ve Bloglar v b) yardım alırım	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Bilgi ve iletişim teknolojilerini kullanarak öğrenmek özyönetimli ve bağımsız olmamı sağlar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Karşılaştığım teknik problemleri nasıl çözeceğimi bilirim.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yeni teknolojilerin kullanımını kolaylıkla öğrenebilirim.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Önemli olduğunu düşündüğüm yeni teknolojilere ayak uydurabilirim.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Birçok farklı teknoloji hakkında bilgim var.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oğrenmede ve yeni şeyler oluşturmada (Sunumlar, dijital hikâyeler, <u>wikiler</u> , <u>bloglar</u> vb) bilgi ve iletişim teknolojilerini kullanmak için gerekli olan teknik becerilere sahibim.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Kesinlikle Katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle Katılıyorum
İnternette bilgi elde etmeye yönelik araştırma ve değerlendirme becerilerime güvenirim.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Öğrenme sürecinde mobil teknolojilerin (Cep telefonları, PDA's, İpadler, akıllı telefonlar vb) kullanım potansiyeli yüksektir.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Öğretmenlerim ders anlatırken bilgi ve iletişim teknolojilerini daha çok kullanmalıdır.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bilgi ve iletişim teknolojileri proje çalışmalarında ve diğer öğrenme etkinliklerinde arkadaşlarımla daha iyi işbirliği içinde çalışmamı sağlar.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bilgi ve iletişim teknolojileri becerilerim iyidir.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
İnternet tabanlı aktivitelerle ilgili konular (Örn: siber güvenlik, eser hırsızlığı, araştırma konuları vb) bilirim.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>