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## INVESTIGATION OF CREATIVE PERSONALITY TRAITS AS PREDICTORS OF 21<sup>ST</sup> CENTURY SKILLS AND COMPETENCES OF PROSPECTIVE CLASSROOM TEACHERS

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### ABSTRACT

The aim of this research is to examine the predictive characteristics of prospective classroom teachers on their creative personality traits and their perceptions of 21st century skills competency. This research was carried out according to the correlational survey model, which is one of the quantitative research methods. The participants of this research are prospective classroom teachers studying at a university in Turkey in the spring term of 2020-2021. The scales used in the research were sent to the students online (Google Forms). In this research, the Creative Personality Traits Scale and the 21st Century Skills and Competences Scale were used as data collection tools. The relationships between the dimensions determining the scale levels of the prospective classroom prospective teachers were examined through correlation and regression analyses. t-test, one-way analysis of variance (ANOVA) and post-hoc (Tukey, LSD) analyzes were used to examine the differences in scale levels according to the descriptive characteristics of the prospective classroom teachers. The regression analysis performed to determine the cause-effect relationship between creative personality total and century skills proficiency total was found to be significant. In this context, it can be suggested to carry out activities to improve the creativity of prospective teachers who will raise the new generation so that they can develop their 21st century skills.

**Keywords:** 21st Century Skills, creativity, prospective classroom teachers

## **INTRODUCTION**

The 21st century has been called the information age, as people have more access to information than ever before (Kozikoglu & Altunova, 2018). In order for people to adapt to the era and society they live in, they need to acquire many skills in the period they live. Along with many changes in the 21st century, environments that require people to compete in many fields such as economic, culture, industry, social and education have emerged. To keep up with all the technological and global changes and developments and not to lag behind the times, with the 21st century, changes have occurred in the basic skills that individuals should have (Erkilic, 2020).

It is very important to keep up with the changes and developments in this age, in which the information and communication technologies we live in are spreading rapidly and the change and development in one place affect the whole world. While everything in the world continues to change and develop rapidly at every moment, individuals who will shape the future need to be equipped with the skills, qualifications and competencies required by the age in order to keep up with the time and age and to overcome all these successfully (Barasi, 2020). In today's world, where the importance given to people is also increasing, the competencies, basic skills and qualifications that individuals must have in order to realize themselves are also changing with the changes brought about by the age we live in. 21st century skills are skills such as creativity, innovation, critical thinking, problem solving, technology, information literacy (Murat, 2018).

The 21st century brings a new approach to the skills necessary for students to succeed in school and life. Some educational and professional institutions take into account current social and economic conditions and propose an appropriate framework that includes a wide range of skills and support capabilities (Chalkiadaki, 2018). Educators and policy makers analyze the practices and expectations of education and work environments based on the current needs of the information and knowledge-based global society of the digital age, and the 21st century technology needed for citizens to prosper. Identifies and defines. An era of rapid change. Although still in the process of being fully clarified, several frameworks for such 21st century technologies are being released and amended (Sanabria & Arámburo-Lizárraga, 2017). Although researchers and educators have come up with many definitions of 21st century skills, they usually refer to the skills students need to cope with the realities and conditions of the 21st century. In other words, 21st century skills include critical thinking, problem solving, creativity, communication, collaboration, innovation, teamwork, decision-making, leadership, knowledge application, autonomy and learning and other basic skills (Anagun, 2018).

There are many resources that examine 21st century skills. There is also a resource that examines 21st-century skills and incorporates them, it is a United States-based organization named "Partnership for 21st Century Skills [P21]". This organization includes the knowledge, skills and expertise that individuals need to be successful in business and life. This establishment handles 21st century skills in three main categories as Learning and Innovation, Media and Technology and Life and Career skills (P21, 2015). These skills are discussed as follows;

Core Content: 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.

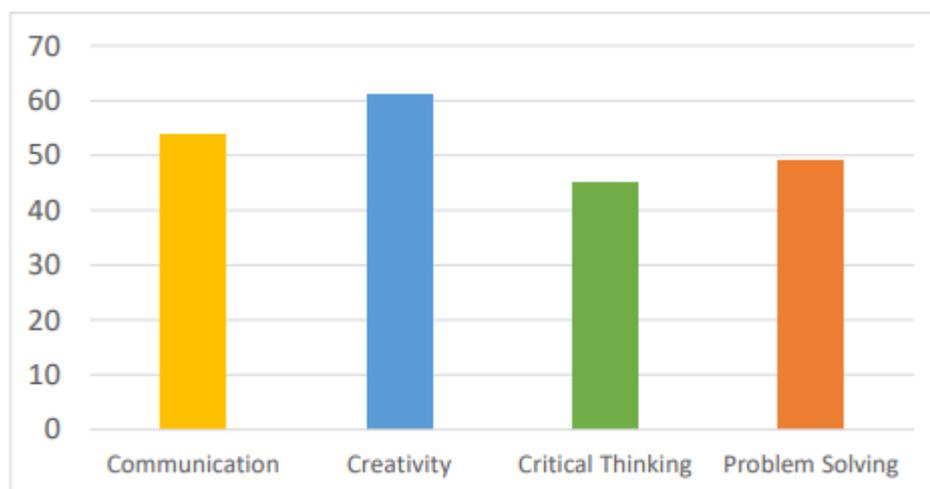
Information, Media and Technology Skills; Information and Communication Technologies literacy, Information literacy and Media Literacy.

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

Support Education Systems; Standards and Assessment, Curriculum and Teaching, Professional development and learning environments.

What are the skills that will be required in the twenty-first century? Although there is general agreement on these skills, there is no clear definition, and defining these skills is difficult. The reason for this is that different institutions and organizations define themselves based on their specific areas of expertise (Gokbulut, 2020).

Communication, creativity, critical thinking, and problem solving are the four most frequently mentioned skills in national strategy documents of 152 countries (Figure 1). Other skills identified include information technology, social skills, and business skills, indicating that countries clearly define a broad range of skills beyond academic skills (Care et al., 2018).



**Figure 1.** Four Most Frequently Identified Skills in National Policy Documents

### **Literature Review**

#### *Learning and Renewal Skills*

In order to adapt to the increasingly complex and difficult life and work conditions in the 21st century and to be successful in these fields, there are some 21st century skills that people need to add to themselves besides their

school diplomas. In order for individuals to be successful both in business and in their lives in the 21st century; they need to be individuals who can think creatively, are open to criticism, can make self-criticism, know how to access information in different ways, have a good command of technology, can solve problems, are productive, have leadership skills, who can cooperate and has communication skills (Eryilmaz & Uluyol, 2015). Learning and renewal skills; focuses on critical learning skills and innovation.

In addition to traditional topics, it adds interdisciplinary 21st century themes related to some of the key issues and issues of our time, such as global awareness (multicultural awareness and understanding); Environmental literacy (ecological awareness and understanding of energy and resource sustainability); Financial literacy (knowledge of economics, business and entrepreneurship); Health literacy (health, nutrition and preventive medicine); and civic literacy (civil participation, community service, ethics and social justice) (Trilling and Fadel, 2009). With the acquisition of learning and renewal skills, individuals can start their social and economic life better equipped. Learning and renewal skills include individuals' creative thinking, critical thinking, communication, and cooperation skills. Individuals with these skills have features such as being able to look at events from different perspectives, analyze their thoughts and evaluate them incompletely and excessively, convey their thoughts to the other party with an effective language, work in harmony with different people in different environments, are aware of their responsibilities, and guide the people around them with their creative ideas (A et al. ., 2016).

#### *Creativity and Renewal Skills*

Creativity means defying stereotypes, feeling excited and curious about reaching the new, and having a desire to try new things. Individuals who can think creatively are people who do not follow the path that everyone takes, who do not look at events and situations from the perspective everyone sees, who want to try new ways, who want to look at events from different windows and have different experiences, who want to break the existing chains and find their own way (Adiguzel, 2018).

Creativity, which exists as a talent in every individual who has lived in every region of the world from past to present, has an important place in the development and development of societies and humanity in today's information and technology age. We can list the common aspects of the concept of creativity and creative individuals, which has many different definitions nowadays as; making a difference thanks to their original ideas, producing new and useful ideas, being open to gaining new experiences, coming together with different people and trying to develop new ideas in cooperation, being able to self-criticize, and thus being able to see their shortcomings and mistakes and learn from them (Gelen, 2017; Kavukcu, 2021).

According to the Institute of Museum and Library Services (2009), the things to be done to develop creative works are listed as follows (Semmel, 2009);

- Use a wide variety of idea generation techniques (such as brainstorming),

- Generate new and valuable ideas (both incremental and radical concepts),
- Elaborate, refine, analyze and evaluate ideas to improve and maximize creative efforts.
- Show your imagination
- Work creatively with others,
- Develop, implement and communicate new ideas effectively,
- Be open and sensitive to new and different perspectives
- Demonstrate originality and creativity in work and understand the real-world limits of embracing new ideas,
- See failure as an opportunity to learn,
- Understand that creativity and innovation are a long-term, cyclical process of small successes and frequent mistakes,
- Implement Innovations; act on creative ideas to make a tangible and useful contribution to the field of innovation

#### *Critical Thinking and Problem Solving Skills*

In the developing world, the fact that acquiring knowledge has become very simple imposes greater responsibilities on teachers. An education program that does not prompt students to think and does not have studies to make different inferences from the ready knowledge they have acquired will prevent students from producing new ideas. Nowadays, instead of putting ready knowledge in front of students in a stereotyped way and expecting them to memorize this information, with the increasing importance of teaching students to think; training programs that provide environments and conditions should be prepared where students can criticize, produce information themselves, question existing information, keep their curiosity and motivation alive (Akbiyik & Seferoglu, 2006).

The desire to learn the main source of information after acquiring the information, the desire to reveal new information from the information obtained, and the sense of curiosity is the main reason for the possibility that the acquired information may not always be correct. The critical thinking skill, which forms the basis for individuals to form their own thinking systems and learn to think, is an inquisitive thinking skill, and individuals need to have different perspectives and a sufficient level of thinking infrastructure in order to improve their critical thinking skills (Karaduz, 2010).

In our daily life, we encounter many obstacles and difficulties on the way to reaching our goals. We need to have problem-solving skills in order to cope with these obstacles and difficulties we encounter, to produce effective solutions, and to find alternative solutions to existing solutions (Eryilmaz & Uluyol, 2015).

In today's information and technology age, where everything is changing at every moment, one of the basic skills that individuals should have in living conditions that have become an increasingly complex structure compared

to previous years is problem-solving skills. As a result, we can adapt to life, which finds meaning in human hands with problems and solutions, as long as we can solve problems effectively (Aslan & Ulucinar Sagir, 2012).

#### *Communication and Collaboration Skills*

Individuals interact with each other throughout their lives in order to transfer their feelings, ideas, and acquisitions and to receive transfer from the other party. Communication, which is an action that human beings will continue to perform from the first day of existence and even in the future, is the ability to accurately and clearly convey people's feelings, thoughts and information to the other party (Basar, 2018; Ceylan, 2019).

Individuals want to convey their feelings, ideas and acquisitions to the individuals around them or to the society they live in. Communication, which is based on mutual interaction between at least two people, is; the process of creating an impact by sharing knowledge, skills, feelings, thoughts, attitudes, etc. and conveying our feelings, thoughts and ideas to others in various ways (Adiguzel, 2018).

Learning is a social activity that occurs in many areas such as school, workplace, and social life. Individuals with effective communication skills are those who can communicate and cooperate with others in different environments by using verbal, non-verbal or written tools and take responsibility in these environments. In today's technology age, it is possible to communicate with people from many different cultures through various social networks via smartphones, tablets, and computers. Especially when children are at school age, they should be taught the importance of communicating with people from many different cultures and that they should respect the beliefs, understanding, worldviews and values they adopt so that they can have intercultural interaction, knowledge and skills (Cinar, 2019; Erkilic, 2020).

Cooperation is the effort of each individual in the group for the same goal by fulfilling their duties and responsibilities in order to achieve the determined goal. Collaborative individuals are responsible both to others in the group and to themselves. The age we live in has made it a necessity for us to turn the wealth created by personal differences into opportunities and to work collaboratively to produce new information, to be open to innovations, different perspectives, and to work in cooperation with different people (Ceylan, 2019; Atalay, 2015).

#### *Information, Media and Technology Skills*

In today's world where technology, media literacy and information literacy are gaining more and more importance, knowing only literacy and four-process skills is no longer sufficient to keep up with the times. In today's world where it is very easy to reach everything, individuals should be trained about the methods of reaching the right information, how to use it after reaching it, and what to do to protect the new product that emerges after its use. In today's world, where the emergence, spread and consumption of information takes place at a very rapid pace, it will be more appropriate to teach and develop individuals through the education

system how to obtain information, how to use it correctly, how to disseminate information and how to protect information (Varki, 2020).

Today, individuals who do not lose their sense of curiosity about the information that can be easily accessed can confirm the accuracy of the information they have obtained with the same ease. individuals who have realized and developed themselves in the field of 21st-century skills such as knowledge, media, and technology skills; can easily keep up with the requirements of the age with competencies such as easy access to information, using different technological tools and equipment, questioning the accuracy of the information published through the media, contributing to the production of information, using the information they obtain for the solution of the problems they encounter, and questioning the information and the sources of information as they are (Demir, 2020; Aygun et al., 2016).

With the increase in today's technological developments, the news in the press or the information shared in the news broadcasts reach individuals faster. The accuracy of these news and information should be investigated. In order for individuals of the 21st century to be effective citizens in the lives that are intertwined with the technology and media brought by the information age, they need to have skills such as being able to analyze, evaluate and question the information they reach through the media, having a command of technology in areas such as the internet, computers, technological tools and equipment (Ceylan, 2019).

#### *Information Literacy*

In today's world where learning is not limited to the school environment, one of the basic skills that should be acquired by students is information literacy. Information literate individuals are those who know the ways of accessing information when they need information, can analyze and evaluate the information they have obtained, produce new information and share this information with others (Akkoyunlu & Kurbanoglu, 2004).

In order to solve the existing problem of the individual and to make decisions information literacy is realizing the need for information, collecting information from various fields, reaching a lot of information, evaluating this information and using the information effectively. Information literacy, which takes place in the whole of human life, is a broad concept that gathers issues such as quality of life, efficiency in the performance of the individual in business life, citizenship rights, democracy, integration with the society and acceptance by the society (Kurbanoglu, 2010).

Information literacy is one of the skills that exist in people who make learning a goal throughout their lives. In these days, when information is one click away from us on smart phones, tablets, computers instead of heavy encyclopedias, books and dictionaries, we encounter a lot of right-wrong, necessary-unnecessary information, information literacy skill is one of the basic skills that every individual should acquire in the 21st century. Individuals who are information literate; in the process of searching for information, has the ability to reach the

information they need and choose the right information without getting lost in the information stacks (Baran & Ata, 2014).

One of the biggest responsibilities in helping students acquire information literacy skills falls to teachers. Teachers without information literacy will have difficulties in predisposing the students with these skills. With their information literacy skills, teachers cease to be in the role of “lecturing” and enter the role of “guiding” their students correctly. The ability of teachers to be information literate provides them with the opportunity to develop both their personal and professional lives, and to provide their students with this skill effectively and correctly, and to prepare appropriate environments and opportunities for their students to develop these skills (Akkoyunlu & Kurbanoglu, 2004).

#### *Information and Communication Technologies (ICT) Literacy*

Technology, the use of which is increasing and will continue to increase in all areas of our lives, is always in our lives at home, at school, on the street, at work and in the library. We need to have information and communication technologies literacy skills in order to keep up with the age, increase our living standards and make our lives easier with technology that affects the world more and more each day (Eryilmaz & Uluyol, 2015).

The development of a global knowledge society and the rapid integration of ICT require the acquisition of digital skills, which are necessary for employment and social participation, as well as the development of 21st century skills, problem solving, information exchange or digital thinking. The context in the process of labor market changes is considered important. These changes require more attention in identifying and acquiring the skills people need to actively and effectively participate in the knowledge society (Van Laar et al., 2017).

Information and communication technologies literacy, which has replaced literacy in ancient times in the 21st century, is one of the compulsory skills that every individual should have in our age. Information and communication technologies literacy skills, beyond the ability to read, write, and perform numerical operations, constitute the whole of abilities such as accessing the necessary information from the stacks of information existing in virtual environments, learning in virtual environments, using technological tools and equipment (Ceylan, 2019; Ceylan & Akcay, 2008). Digital capabilities have become a key concept for discussing what skills and understanding citizens should have in a knowledge society. Digital literacy includes information management, collaboration, communication and sharing, content and knowledge creation, ethics and accountability, assessment and problem solving, and technical operations. Digital technology is changing the traditional learning and skills required in the new digital environment. A detailed conceptual framework from the 21st Century Alliance (Van Laar et al., 2017).

Children of the 21st century use technological tools more easily, effectively and fluently than their parents and teachers. Children of the 21st century use technological tools more easily, effectively and fluently than their parents and teachers. In addition to these predispositions of children to technology, children should be guided

to reach the necessary information when necessary, to use technology correctly and effectively in their personal lives, and to find solutions to the problems they encounter through technology. The use of technology, which has entered many areas in our daily lives such as health, banking, transportation, security, shopping, is inevitable in the field of education. Teachers need to constantly update themselves in order to adapt to what the age brings. The inclusion of information and communication technologies in the field of education and the active use of these tools will contribute to the better preparation of students for their future business and social lives, to make students understand the importance of thinking and producing throughout their lives, and to obtain information from different learning environments (Ceylan and Akcay, 2020)

#### *Media Literacy*

The media, which gathers written, oral, visual texts and images and communication tools under a single roof, constitutes an important part of our lives in today's rapidly developing technology. While media has positive contributions to our lives it has negative effects on children. In order to minimize and eliminate these negative contributions, children should be taught media literacy skills at an early age (Ozkan, 2020).

In order to understand and accurately describe human beings, we need to know every field that is intertwined with literacy in which people are involved. Today, the concept of literacy is not only limited to interpreting the letters and symbols in the alphabet but also expanded as reading and writing the information in various fields and environments presented by the developing technology day by day (Altun, 2014).

In our lives blended with media literacy and technology; It is the ability to understand, analyze and evaluate the messages that appear every moment in many fields such as television, magazines, newspapers and news. It is necessary to raise awareness of vulnerable children, who are exposed to various media messages at any time with the advanced communication tools and equipment brought by technology, in the field of media starting from primary school age, and to teach them to use the media actively, effectively and correctly (Deveci and Cengelci, 2008).

#### *Life and Career Skills*

In order for an individual to have a problem-free business life with individuals who think differently and to be open to new ideas, the individual must be assertive, harmonious, and have effective verbal and written communication. In today's challenging, competitive life and professional life, individuals need to have life and career skills, which are one of the links of the chain, in addition to their knowledge and thinking skills, in order to be able to work harmoniously and be open to different ideas, values and opinions (Kaya, 2020).

Today, a person aiming for success in business life should have access to sufficient equipment and subsequently, should make features such as speed, adaptability, openness to innovations, and effective communication for business life. Career and life skills, which include having the necessary knowledge, skills and competencies for

professional life and career planning, which is a part of personal development, are one of the basic skills that individuals should have in the 21st century (Goksun Orhan and Kurt, 2017).

#### *Flexibility and Adaptability*

Flexibility and adaptability, one of the life and career skills, means being able to easily adapt to changing conditions and environments and being flexible when things change. Compatible individuals are usually defined as people who have the ability to work in different environments, respect those who differ from their own thoughts and ideas, are open to innovations, and can manage many different duties and responsibilities at the same time (Eryilmaz and Uluyol, 2015).

We live in a time when conditions and environments in the world are changing every second. The sooner we can adapt to these changing conditions, the sooner we will catch up with the age. That's why we need flexibility and adaptability in order not to lag behind the times and to adapt to the times. Flexibility and adaptability to individuals adds the ability to maintain a balance between constantly changing conditions and personal beliefs and values and to organize the environment in which it works according to new ways and conditions (Barasi, 2020; Ceylan 2019).

#### *Entrepreneurship and Self-Management*

Entrepreneurship; it gathers many skills such as innovation, creativity, analysis, synthesis and evaluation under its spectrum. Entrepreneurial individuals are people who know how to use their existing resources in the most effective and efficient way, who can see the needs when they look around, who can think creatively, who can approach events differently than everyone else, who can take risks to try innovations. Entrepreneurs try to minimize the risk factor by making a situation analysis with the pros and cons before trying innovations and taking risks (Oktem et al., 2003).

Entrepreneurship, which is one of the sub-titles of life and career skills, is not only related to the field of economy, but also to many fields such as social, cultural and technology. Entrepreneurship, which is also accepted as an individual's ability to direct herself, gives individuals the ability to have self-confidence, to be the founder of a team, to see and evaluate opportunities, and to have a vision (Kaya, 2020).

Self-management skill, which is one of the most important goals of education, is to develop or change these behaviors by noticing one's own behavior. Individuals undertake the responsibility of their own behavior with self-management skills, which covers a wide area from our daily personal areas such as preparing a list of things to do during the day, making a lesson plan, preparing a shopping list, and covering a wide area from school, work and social life. With the acquisition of self-management skills to individuals; contributions are made in many areas such as improving the performance at the desired level in the fields of work, school, and academia,

increasing the existing-desired behaviors, reducing the inappropriate and undesirable behaviors, and ensuring the permanence of the learned behaviors (Yucesoy Ozkan, Gursel, and Kircaali-Iftar, 2014).

#### *Sociocultural Skills*

The coexistence of individuals from different cultures can change the individuals' perspective on events and increase their productivity. Social and intercultural skills, which are one of the 21st century skills, include individuals from different cultures working together in harmony, respecting different beliefs, values and ideas, evaluating this cultural-social difference as a wealth, looking at events from a different perspective and finding new solutions. (Cinar, 2019).

Social and intercultural skills are a very important skill that teaches us to put all these aside, no matter how different they are, and to communicate and interact on the common denominator of being a human. People have had cultural interaction both in the past and today by living together with people who have different cultures, beliefs and perspectives on the world. Social and intercultural skills are one of the most important skills we need to have in this age of technology, where we are one click away from meeting and interacting with people from many different cultures from many different parts of the world (Barasi, 2020; Dogan, 2020).

#### *Productivity and Accountability*

As a result of the activities they have done, the students should act in accordance with a certain plan, make the necessary effort to reach the point they planned before the activity, be in harmony with their colleagues during the process, be in constant communication with their colleagues, make good time management, and have different thoughts for the targeted purpose, should be open and be able to take responsibility for the results. Students with productivity and accountability skills, which are one of the most important skills of today are expected to manage projects, prioritize responsibilities to achieve the set goal, work enthusiastically, enthusiastically and motivated, manage time and projects effectively to achieve the goal, cooperate with different groups and with different people, respect group diversity and take responsibility for results (Yalcin, 2018).

Individuals must accept all responsibility that may arise from the resulting product as a result of their individual or group actions. Accountability includes presenting the responsibilities of the individual or the group, the use of resources, and the use of resources in a transparent manner to the external authorities and citizens, together with the examination of the goals and actions carried out by the individual or group, which exists in every field where there is productivity, is authorized and has many opportunities to achieve the determined goal, responding to feedback and expectations and being subject to sanctions if necessary (Buyukkidik, 2020). According to Trilling and Fadel (2009), in order for students to gain productivity and accountability skills effectively in accordance with the purpose, students need to set their goals, plan, and prioritize the work that needs to be done to achieve this goal and use time effectively. Efficiency and accountability are important skills

that all 21st century students and teachers need for success in school, work and life. In order to gain efficiency and accountability skills, the skills that should be acquired by students are as follows (Trilling and Fadel, 2009);

- Managing projects,
- Ability to set and achieve targets even in the face of obstacles and competitive pressures,
- Prioritizing, planning and managing work to achieve the intended result,
- Working in a positive and ethical way,
- Ability to manage time and projects effectively
- Multitasking,
- Participate actively, be reliable and punctual
- Ability to collaborate effectively with teams,
- Respect and appreciate team diversity
- Being responsible for results.

#### *Leadership and Responsibility*

One of the basic skills that today's 21st century individuals should have is leadership and responsibility skills. The concept of leadership, which is a social phenomenon in a constantly changing and developing world, is also affected by these changes and developments. Leadership can be defined as the process of guiding and directing existing resources on how to reach the goal determined by the institution or group in the shortest time, in the most effective and efficient way (Unal, 2012). In order for an individual to be a leader in the business world; it should have the features to evaluate the opportunities, to turn the negative experiences in their favor, to realize their dreams and to bring together the employees with different ideas in a single point. Leadership skill, which has become a sought-after qualification in managers especially in business life, is the ability to use all opportunities in the most correct way, to turn the setbacks into opportunities, to turn ideas into actions, and to turn the disagreements in the group into consensus in the most moderate way (Eryilmaz and Uluyol, 2015).

These days when it is imperative for people to live together with change and developments, it is very important to determine common goals and take actions in this direction. Leadership is the ability to gather and direct people around certain goals, to recognize the area in which each individual is talented and to direct them in order to improve them in these areas, to set an example for the people around them, and to protect the integrity of the group striving for the same purpose. Leadership and responsibility skills are two intertwined skills. While leadership and individual guide the group that has come together to achieve the same goal, responsibility is the ability of the individual to see the big picture and take action by taking into account the interests of the society and to do his/her duties against other members of the group (Kaya, 2020; Ceylan, 2019 ). Today's students are expected to possess a wide range of skills to succeed in future careers. Teacher education should provide teachers with the opportunity to develop the unique skills of the 21st century and the ability to introduce those skills into the classrooms of the future. Prior to employment, teachers must provide the confidence to

incorporate 21st century skills into education, and continue to support the development of 21st century skills. These expectations make it an important research topic for prospective teachers to develop the skills of the 21st century. Research so far has been primarily a cross-sectional study to explain the 21st century skills of prospective teachers, and an intervention study to support the 21st century skills development with a variety of courses and activities (Valtonen et al., 2021).

4C Experience solving global problems through critical thinking, contributing new ideas as a creative individual, solving real-world problems, and working and collaborating in a team. Globalization based on preliminary observations shows that student learning success is only reflected in understanding concepts, and learning skills are still very few; it is expected that 21-year-olds will not complete their studies by themselves. Background plays an important role in activities and learning models that contribute to successful learning. The student's experience has made a unique contribution to shaping learning (Khoiri et al., 2021). In the literature, there are studies that emphasize the importance of the role of teachers in the learning-teaching processes. It can be said that the 21st century teacher should be a good manager, a good observer and a qualified guide who can organize the teaching-learning processes. This is because they must be a person who presents the content to the students and evaluates them (Daghan et al., 2017). The concept of teacher, which was defined as engineer, artist and expert in the past, has now started to be discussed and new definitions have been made. It has begun to be defined as adults who guide students, teach questioning, critical and creative thinking. Teacher competencies and roles have been discussed in many aspects such as educational theories, teaching methods and techniques, and technological processes in the literature (Gurultu et al., 2020). The aim of this research is to examine the predictive characteristics of prospective classroom teachers on their creative personality traits and their perceptions of 21st century skills competency. In line with this general purpose, answers to the following questions were sought:

1. What are the creative personality traits and 21st century skills proficiency perception score levels of primary school prospective teachers?
2. Is there a significant correlation (correlation) between the creative personality traits of primary school teacher prospective teachers and their perceptions of 21st century skills proficiency?
3. Do creative personality traits significantly predict 21st century skills?
4. Do the creative personality traits of primary school prospective teachers differ significantly in terms of gender, class, mother's education level, father's education level, working status, and creativity-related activities?
5. Do prospective classroom teachers' perceptions of 21st century skills proficiency differ significantly in terms of gender, class, mother's education level, father's education level, working status, and creativity-related activities?

**METHOD**

**Design**

This research was carried out according to the correlational survey model, which is one of the quantitative research methods. The correlational survey model is a quantitative approach that includes the use of self-report measures of a carefully selected sample group (Converse, 1987). This model is a flexible approach that can be used to examine a wide variety of fundamental and applied research questions.

**Participants**

The participants of this research are (prospective classroom teachers) undergraduate students studying at a university in Turkey. The scales used in the research were sent to the students online (Google Forms). An information letter was written to the students stating that they have the right to withdraw at any stage of the research. All necessary permissions were obtained before the study and ethical rules were complied with. The data of the research were collected in the spring term of 2020-2021. The demographic characteristics of the students participating in the research are as in Table 1.

**Table 1.** Distribution of Demographic Characteristics of the Students

Groups	Frequency(N)	Percentage (%)
<b>Gender</b>		
Female	132	74,2
Male	46	25,8
<b>Grade</b>		
2	63	35,4
3	40	22,5
4	75	42,1
<b>Mother's Education Status</b>		
Illiterate	31	17,4
Primary School	83	46,6
Secondary School	22	12,4
High School	19	10,7
Associate And Undergraduate Degree	23	12,9
<b>Father's Education Status</b>		
Primary School	70	39,3
Secondary School	40	22,5
High School	37	20,8
Associate And Undergraduate Degree	31	17,4
<b>Employment Status</b>		
Unemployed	111	62,4
Employed	67	37,6
<b>Creative Activity Status</b>		
Yes	114	64,0
No	64	36,0

According to gender, 132 (74.2%) of the students are female and 46 (25.8%) are male. According to their grades students are distributed as, 63 of them 2 (35.4%), 40 of them 3 (22.5%), and 75 of them as 4th graders (42.1%). According to their father's education status, students are divided as; 70 of them primary school graduates (39.3%), 40 of them secondary school (22.5%), 37 (20.8%) high school and 31(17.4%) associate degree and undergraduate graduates. According to their father's employment status, 111 (62.4%) of the them are unemployed and 67 (37.6%) of them are working.

### Data Collection Tools

In this research, the Creative Personality Traits Scale developed by Sahin and Danisman (2017) and the 21st Century Skills and Competences Scale developed by Anagun et al. (2016) were used as data collection tools.

### Validity and Reliability

Before analyzing the research variables, the scales used in the research were examined in terms of validity and reliability. The reliability coefficients ( $\alpha$ ) for each scale and each dimension in the scale are between 0.70 and 0.90. It can be said that these values are at an acceptable level and the scales are reliable (Gurbuz & Sahin, 2014). The Cronbach's alpha internal consistency coefficient for the sub-factors of the Creative Personality Traits scale was calculated between .60 and .65. The overall scale is .67. The reliability of the Creative Personality Traits scale was found to be high as Cronbach's Alpha=0.798 in this study. The reliability coefficient of the 21st Century Skills and Competences scale was determined as Cronbach  $\alpha$ =.889. The reliability of the 21st Century Skills and Competences scale was found to be high as Cronbach's Alpha=0.943 in this study.

### Statistical Analysis of the Data

The data obtained in the research were evaluated in a computer environment through SPSS 22.0 statistical program. Frequency and percentage analyzes were used to determine the descriptive characteristics of the students participating in the research, and mean and standard deviation statistics were used in the analysis of the scale. The values of Kurtosis and Skewness were examined to determine whether the research variables showed a normal distribution seen as Table 2.

**Table 2.** Normal Distribution of Scales

	<b>N</b>	<b>Kurtosis</b>	<b>Skewness</b>
Creative Personality Total	178	-0,023	-0,406
Goal Orientation	178	0,525	-0,679
Inner Motivation	178	1,065	-0,645
Self-Confidence	178	-0,242	-0,251
Risk-Taking	178	-0,094	-0,278
21st Century Skills Competence Total	178	0,888	-0,141
Learning and Renewal Skills	178	0,267	0,321
Life and Career Skills	178	1,569	-0,723
Information, Media and Technology Skills	178	-0,454	-0,184

In the relevant literature, it is accepted as a normal distribution that the results regarding the kurtosis skewness values of the variables are between +1.5 and -1.5 (Tabachnick & Fidell, 2013), +2.0 and -2.0 (George, & Mallery, 2010). If the variance of the variable is unknown, the t-distribution; if the population does not show a normal distribution, non-parametric tests are applied (Field, 2009). The analyzes were continued by assuming that the distribution was normal, since it was at a sufficient level as a sample according to the law of large numbers and the central limit theorem (Harwiki, 2013; Inal and Gunay, 1993; Johnson and Wichern, 2002).

The relationships between the dimensions determining the scale levels of the students were examined through correlation and regression analyses. T-test, one-way analysis of variance (ANOVA) and post-hoc (Tukey, LSD) analyzes were used to examine the differences in scale levels according to the descriptive characteristics of the students. Cohen(d) and Eta squared( $\eta^2$ ) coefficients were used to calculate the effect size. The effect size indicates whether the difference between the groups is large enough to be considered significant. Cohen value is evaluated as 0.2: small; 0.5: medium; 0.8: large; eta squared 0.01: small; 0.06: medium; 0.14: large (Buyukozturk et al., 2018).

**FINDINGS**

The data obtained from the study group was analysed and presented in tables. The score averages of scales was given in the Table below.

**Table 1.** Score Averages of Scales

	<b>N</b>	<b>Aver.</b>	<b>Ss</b>	<b>Min.</b>	<b>Max.</b>
Creative Personality Total	178	65,405	7,431	46,000	84,000
Goal Orientation	178	18,893	2,954	10,000	25,000
Inner Motivation	178	20,927	2,737	11,000	25,000
Self-Confidence	178	10,607	2,448	5,000	15,000
Risk-Taking	178	14,978	2,515	8,000	20,000
21st Century Skills Competence total	178	160,247	19,376	95,000	210,000
Learning and Renewal Skills	178	63,685	9,844	39,000	90,000
Life and Career Skills	178	64,590	7,781	36,000	80,000
Information, Media and Technology Skills	178	31,972	4,841	20,000	40,000

Student’s “creative personality total” average was estimated as 65,405±7,431 (Min=46; Max=84), “goal orientation” average as 18,893±2,954 (Min=10; Max=25), “inner motivation” average 20,927±2,737 (Min=11; Max=25), “self-confidence” average 10,607±2,448 (Min=5; Max=15), “risk-taking” average 14,978±2,515 (Min=8; Max=20), “21st century skills competence total” average 160,247±19,376 (Min=95; Max=210), “learning and renewal skills” average 63,685±9,844 (Min=39; Max=90), “life and career skills” average 64,590±7,781 (Min=36; Max=80), and “information, media and technology skills” average was detected as 31,972±4,841 (Min=20; Max=40),

**Table 2.** Correlation Analysis of Creative Personality Scale Scores and 21st Century Skills Competence Scale Scores

		<b>Creative Personality Total</b>	<b>Goal Orientation</b>	<b>Inner Motivation</b>	<b>Self-Confidence</b>	<b>Risk-Taking</b>
<b>21st Century Skills Competence Total</b>	r	0,618**	0,397**	0,570**	0,331**	0,418**
	p	0,000	0,000	0,000	0,000	0,000
<b>Learning and Renewal Skills</b>	r	0,549**	0,303**	0,540**	0,339**	0,349**
	p	0,000	0,000	0,000	0,000	0,000
<b>Life and Career Skills</b>	r	0,586**	0,424**	0,499**	0,279**	0,418**
	p	0,000	0,000	0,000	0,000	0,000
<b>Information, Media and Technology Skills</b>	r	0,416**	0,294**	0,381**	0,187*	0,288**
	p	0,000	0,000	0,000	0,012	0,000

\*<0,05; \*\*<0,01; Correlation Analysis

When the data in Table 4 was investigated, the correlation analyzes between the scores of creative personality total, goal orientation, inner motivation, self-confidence, risk-taking, 21st century skills proficiency total, learning and renewal skills, life and career skills, information media and technology skills are examined; between 21st century skills proficiency total and creative personality total  $r=0.618$  was positive ( $p=0.000$ ), between 21st century skills proficiency total and inner motivation was  $r=0.57$  positive ( $p=0.000$ ), between 21st century skills proficiency total and self-confidence was  $r=0.331$  positive ( $p=0.000$ ), between 21st century skills competence total and risk-taking was  $r=0.418$  positive ( $p=0.000$ ), between learning and renewal skills and creative personality total was  $r=0.549$  positive ( $p=0.000$ ), between learning and renewal skills and goal orientation was  $r=0.303$  positive ( $p=0.000$ ), between learning and renewal skills and inner motivation, was  $r=0.54$  positive ( $p=0.000$ ), between learning and renewal skills and self-confidence was  $r=0.339$  positive ( $p=0.000$ ), between learning and renewal skills and risk-taking was  $r=0.349$  positive ( $p=0.000$ ), between life and career skills and creative personality total was  $r=0.586$  positive ( $p=0.000$ ), between life and career skills and goal orientation was  $r=0.424$  positive ( $p=0.000$ ), between life and career skills and inner motivation was  $r=0.499$  positive ( $p=0.000$ ), between life and career skills and self-confidence, was  $r=0.279$  positive ( $p=0.000$ ), between life and career skills and risk-taking was  $r=0.418$  positive ( $p=0.000$ ), between information, media and technology skills and creative personality total was  $r=0.416$  positive ( $p=0.000$ ), between information media and technology skills and goal orientation was  $r=0.294$  positive ( $p=0.000$ ), between information media and technology skills and inner motivation was  $r=0.381$  positive ( $p=0.000$ ), between information, media and technology skills and self-confidence was  $r=0.187$  positive ( $p=0.012$ ), and a positive  $r=0.288$  ( $p=0.000$ ) correlation was found between information, media and technology skills and risk taking.

**Table 3.** The Predictive Effect of Creative Personality on 21st Century Skills and Competences

Dependent Variable	Independent Variable	$\beta$	T	p	F	Model (P)	R <sup>2</sup>
21st Century Skills Competence Total	Stable	54,813	5,390	0,000	108,873	0,000	0,379
	Creative Personality Total	1,612	10,434	0,000			
21st Century Skills Competence Total	Stable	48,747	4,737	0,000	30,216	0,000	0,398
	Goal Orientation	1,107	2,600	0,010			
	Inner Motivation	2,831	5,927	0,000			
	Self-Confidence	0,854	1,694	0,092			
	Risk-Taking	1,488	3,005	0,003			
Learning and Renewal Skills	Stable	13,615	2,468	0,015	22,718	0,000	0,329
	Goal Orientation	0,230	1,007	0,315			
	Inner Motivation	1,481	5,782	0,000			
	Self-Confidence	0,628	2,323	0,021			
	Risk-Taking	0,540	2,033	0,044			
Life and Career Skills	Stable	22,222	5,171	0,000	24,658	0,000	0,348
	Goal Orientation	0,621	3,490	0,001			
	Inner Motivation	0,883	4,425	0,000			
	Self-Confidence	0,181	0,860	0,391			
	Risk-Taking	0,684	3,308	0,001			
Information, Media and Technology Skills	Stable	12,910	4,282	0,000	10,170	0,000	0,172
	Goal Orientation	0,257	2,056	0,041			
	Inner Motivation	0,467	3,340	0,001			
	Self-Confidence	0,045	0,304	0,761			
	Risk-Taking	0,264	1,820	0,071			

When the data in Table 5 was investigated the regression analysis performed to determine the cause and effect relationship between the creative personality total and the 21st-century skills competence total was found to be significant ( $F=108,873$ ;  $p=0,000$ ). The total change in the 21st-century skills competence total level is explained by the creative personality total at a rate of 37.9% ( $R^2=0.379$ ). Creative personality total increases the 21st-century skills' total level of competence ( $\beta=1,612$ ).

The regression analysis performed to determine the cause-effect relationship between goal orientation, inner motivation, self-confidence, risk-taking and century skills proficiency total was found to be significant ( $F=30,216$ ;  $p=0.000$ ). 39.8% of the total change in the 21st-century skills competency level is explained by goal orientation, inner motivation, self-confidence, and risk-taking ( $R^2=0.398$ ). Goal orientation increases the total level of 21st-century skills competence ( $\beta=1,107$ ). Inner motivation increases the total level of 21st century skills competence ( $\beta=2.831$ ). Self-confidence doesn't affect the total level of 21st century skills competence ( $p=0.092>0.05$ ). Risk-taking increases the total level of 21st century skills competence ( $\beta=1,488$ ).

The regression analysis performed to determine the cause-effect relationship between goal orientation, inner motivation, self-confidence, risk-taking and, learning and renewal skills was found to be significant ( $F=22,718$ ;  $p=0.000$ ). 32.9% of the total change in the level of learning and renewal skills is explained by goal orientation, inner motivation, self-confidence, and risk taking ( $R^2=0.329$ ). Goal orientation does not affect the level of learning and renewal skills ( $p=0.315>0.05$ ). Inner motivation increases the level of learning and renewal skills

( $\beta=1,481$ ). Self-confidence increases the level of learning and renewal skills ( $\beta=0.628$ ). Risk taking increases the level of learning and renewal skills ( $\beta=0.540$ )

The regression analysis performed to determine the cause-effect relationship between goal orientation, inner motivation, self-confidence, risk-taking, and life and career skills was found to be significant ( $F=24,658$ ;  $p=0,000$ ). 34.8% of the total change in life and career skills is explained by goal orientation, inner motivation, self-confidence, and risk taking ( $R^2=0.348$ ). Goal orientation increases the level of life and career skills ( $\beta=0.621$ ). Inner motivation increases the level of life and career skills ( $\beta=0,883$ ). Self-confidence does not affect the level of life and career skills ( $p=0.391>0.05$ ). Risk taking increases the level of life and career skills ( $\beta=0,684$ ).

The regression analysis performed to determine the cause-effect relationship between goal orientation, inner motivation, self-confidence, risk-taking and information, media and technology skills was found to be significant ( $F=10.170$ ;  $p=0.000$  ). 17.2% of the total change in the level of information, media and technology skills is explained by goal orientation, inner motivation, self-confidence, and risk-taking ( $R^2=0.172$ ). Goal orientation increases the level of knowledge, media and technology skills ( $\beta=0.257$ ). Inner motivation increases the level of knowledge, media and technology skills ( $\beta=0.467$ ). Self-confidence does not affect the level of knowledge, media and technology skills ( $p=0.761>0.05$ ). Risk taking does not affect the level of knowledge, media and technology skills ( $p=0.071>0.05$ ).

The results of the analysis performed to examine the differentiation of creative personality scores according to descriptive features are given below.

**Table 6 .** Differentiation of Creative Personality Scores by Descriptive Features

Demographic Features	N	Creative Personality Total	Goal Orientation	Inner Motivation	Self-Confidence	Risk-Taking
<b>Gender</b>		Avg. $\pm$ SS	Avg. $\pm$ SS	Avg. $\pm$ SS	Avg. $\pm$ SS	Avg. $\pm$ SS
Female	132	65,462 $\pm$ 7,121	19,076 $\pm$ 2,762	20,955 $\pm$ 2,721	10,553 $\pm$ 2,329	14,879 $\pm$ 2,380
Male	46	65,239 $\pm$ 8,338	18,370 $\pm$ 3,428	20,848 $\pm$ 2,812	10,761 $\pm$ 2,782	15,261 $\pm$ 2,879
t=		0,175	1,400	0,227	-0,495	-0,887
p=		0,861	0,163	0,821	0,621	0,376
<b>Grade</b>		Avg. $\pm$ SS	Avg. $\pm$ SS	Avg. $\pm$ SS	Avg. $\pm$ SS	Avg $\pm$ SS
2	63	64,349 $\pm$ 7,458	18,508 $\pm$ 2,723	20,651 $\pm$ 3,188	10,064 $\pm$ 2,334	15,127 $\pm$ 2,420
3	40	65,750 $\pm$ 6,705	19,325 $\pm$ 2,645	21,025 $\pm$ 2,750	10,975 $\pm$ 2,337	14,425 $\pm$ 2,459
4	75	66,107 $\pm$ 7,763	18,987 $\pm$ 3,278	21,107 $\pm$ 2,305	10,867 $\pm$ 2,549	15,147 $\pm$ 2,613
F=		1,014	1,000	0,505	2,467	1,249
p=		0,365	0,370	0,604	0,088	0,289
<b>Mother's Education Status</b>		Avg $\pm$ SS	Avg $\pm$ SS	Avg $\pm$ SS	Avg $\pm$ SS	Avg $\pm$ SS
Illiterate	31	62,871 $\pm$ 8,578	18,548 $\pm$ 3,443	20,161 $\pm$ 2,491	9,677 $\pm$ 2,891	14,484 $\pm$ 2,987
Primary School	83	66,663 $\pm$ 6,109	19,253 $\pm$ 2,789	21,349 $\pm$ 2,244	10,807 $\pm$ 2,472	15,253 $\pm$ 2,262
Secondary School	22	64,546 $\pm$ 7,035	18,136 $\pm$ 3,060	20,636 $\pm$ 2,804	10,682 $\pm$ 2,056	15,091 $\pm$ 2,389
High School	19	63,947 $\pm$ 8,935	18,421 $\pm$ 2,411	20,579 $\pm$ 3,717	10,737 $\pm$ 2,600	14,211 $\pm$ 2,485
Associate And Undergraduate Degree	23	66,304 $\pm$ 8,589	19,174 $\pm$ 3,143	21,000 $\pm$ 3,542	10,957 $\pm$ 1,718	15,174 $\pm$ 2,823

F=		1,873	0,946	1,251	1,405	1,036
p=		0,117	0,439	0,291	0,234	0,390
<b>Father's Education Status</b>		Avg ± SS	Avg ± SS	Avg ± SS	Avg ± SS	Avg ± SS
Primary School	70	64,143±7,614	18,757±3,386	20,386±2,305	10,229±2,819	14,771±2,616
Secondary School	40	67,500±6,304	19,150±2,797	21,625±2,559	11,100±2,085	15,625±2,529
High School	37	66,730±6,140	19,432±2,316	21,703±2,526	10,919±2,241	14,676±1,987
Associate And Undergraduate Degree	31	63,968±9,035	18,226±2,753	20,323±3,655	10,452±2,142	14,968±2,787
F=		2,579	1,090	3,408	1,348	1,222
p=		0,055	0,355	0,019	0,260	0,303
PostHoc=				2>1, 3>1, 2>4, 3>4 (p<0.05)		
<b>Employment Status</b>		Avg ± SS	Avg ± SS	Avg ± SS	Avg ± SS	Avg ± SS
Unemployed	111	65,225±7,173	18,955±2,738	20,802±2,789	10,604±2,356	14,865±2,399
Employed	67	65,702±7,886	18,791±3,301	21,134±2,657	10,612±2,611	15,164±2,706
t=		-0,413	0,358	-0,784	-0,022	-0,768
p=		0,680	0,721	0,434	0,983	0,443
<b>Creative Activity Status</b>		Avg ± SS	Avg ± SS	Avg ± SS	Avg ± SS	Avg ± SS
Yes	114	67,597±6,786	19,412±2,877	21,667±2,334	11,281±2,204	15,237±2,451
No	64	61,500±6,953	17,969±2,884	19,609±2,920	9,406±2,415	14,516±2,582
t=		5,701	3,209	5,147	5,259	1,848
p=		0,000	0,002	0,000	0,000	0,066

When the data in Table 6 was investigated the students' total creative personality, goal orientation, inner motivation, self-confidence, and risk taking scores did not differ significantly by gender ( $p>0.05$ ). The creative personality total, goal orientation, inner motivation, self-confidence, and risk taking scores of the students do not differ significantly according to the grade ( $p>0.05$ ). The creative personality total, goal orientation, inner motivation, self-confidence, and risk-taking scores of the students do not differ significantly according to the educational status of the mother ( $p>0.05$ ). The students' inner motivation scores differ significantly according to their father's educational status ( $F=3.408$ ;  $p=0.019<0.05$ ;  $\eta^2=0.055$ ). The reason for the difference is that the inner motivation scores of those whose father's education level is middle school are higher than those whose father's education is primary school ( $p<0.05$ ). The inner motivation scores of those whose father's education level is secondary school are higher than those whose father's education status is associate degree and undergraduate ( $p<0.05$ ). The inner motivation scores of those whose father's education level is high school are higher than those whose father's education level is associate degree and undergraduate ( $p<0.05$ ). The creative personality total, goal orientation, self-confidence, and risk-taking scores of the students did not differ significantly according to the educational status of their fathers ( $p>0.05$ ). The creative personality total, goal orientation, inner motivation, self-confidence and risk taking scores of the students do not differ significantly according to their working status ( $p>0.05$ ). Creative personality total scores of those who do creative activities ( $x=67,597$ ) were higher than those who did not engage in creative activities ( $x=61,500$ ) ( $t=5.701$ ;  $p=0.05$ ;  $d=0.890$ ;  $\eta^2=0.156$ ).

The goal-directedness scores of those who did creative activities ( $x=19.412$ ) were higher than those who did not engage in creative activities ( $x=17.969$ ) ( $t=3.209$ ;  $p=0.002<0.05$ ;  $d=0.501$ ;  $\eta^2=0.055$ ). The inner motivation scores of those who do creative activities ( $x=21,667$ ) were found to be higher than those who did not engage in creative activities ( $x=19,609$ ) ( $t=5,147$ ;  $p=0<0.05$ ;  $d=0.804$ ;  $\eta^2=0,131$ ). The self-confidence scores of those who did creative activities ( $x=11.281$ ) were higher than those who did not engage in creative activities ( $x=9.406$ ) ( $t=5.259$ ;  $p=0.05$ ;  $d=0.821$ ;  $\eta^2=0.136$ ). The risk-taking scores of the students do not differ significantly according to the creativity activity ( $p>0.05$ ).

The results of the analysis conducted to examine the differentiation of 21st Century skills proficiency scores according to descriptive features are given below.

**Table 7.** Differentiation of 21st Century Skills Proficiency Scores According to Descriptive Features

Demographic features	n	21st Century Skills Competence Total	Learning and Renewal Skills	Life and Career Skills	Information, Media and Technology Skills
<b>Gender</b>		Avg ± SS	Avg ± SS	Avg ± SS	Avg ± SS
Female	132	159,553±17,074	62,871±8,886	64,652±7,011	32,030±4,557
Male	46	162,239±24,952	66,022±11,992	64,413±9,745	31,804±5,632
t=		-0,809	-1,883	0,179	0,272
p=		0,501	0,108	0,879	0,786
<b>Grade</b>		Avg ± SS	Avg ± SS	Avg ± SS	Avg ± SS
2	63	159,381±17,770	62,905±9,273	64,175±7,167	32,302±4,431
3	40	158,525±21,299	63,175±10,556	64,225±8,833	31,125±5,044
4	75	161,893±19,732	64,613±9,974	65,133±7,754	32,147±5,069
F=		0,489	0,582	0,314	0,805
p=		0,614	0,560	0,731	0,449
<b>Mother's Education Status</b>		Avg ± SS	Avg ± SS	Avg ± SS	Avg ± SS
Illiterate	31	150,161±17,100	58,936±8,509	62,097±8,006	29,129±4,177
Primary School	83	163,627±14,096	65,048±8,255	65,831±5,360	32,747±4,302
Secondary School	22	159,318±20,613	63,046±10,168	64,682±7,033	31,591±5,578
High School	19	155,790±19,226	61,842±8,174	61,842±9,263	32,105±4,618
Associate And Undergraduate Degree	23	166,217±30,520	67,304±14,757	65,652±12,364	33,261±5,754
F=		3,762	3,336	2,073	3,887
p=		0,006	0,012	0,086	0,005
PostHoc=		2>1, 5>1 (p<0.05)	2>1, 5>1 (p<0.05)		2>1, 4>1, 5>1 (p<0.05)
<b>Father's Education Status</b>		Avg ± SS	Avg ± SS	Avg ± SS	Avg ± SS
Primary School	70	158,643±17,774	62,986±8,806	64,271±7,370	31,386±4,744
Secondary School	40	161,275±15,044	63,500±8,590	65,200±5,694	32,575±4,722
High School	37	160,973±16,751	64,297±8,938	64,946±6,114	31,730±4,617
Associate And Undergraduate Degree	31	161,677±29,109	64,774±14,097	64,097±12,004	32,807±5,468
F=		0,268	0,293	0,186	0,885
p=		0,849	0,830	0,906	0,450
<b>Employment status</b>		Avg ± SS	Avg ± SS	Avg ± SS	Avg ± SS

Unemployed	111	158,775±18,949	62,496±9,470	64,351±7,797	31,928±4,970
Employed	67	162,687±19,968	65,657±10,202	64,985±7,796	32,045±4,656
t=		-1,308	-2,096	-0,525	-0,156
p=		0,193	0,038	0,600	0,877
<hr/>					
<b>Creative Activity Status</b>		Avg ± SS	Avg ± SS	Avg ± SS	Avg ± SS
Yes	114	165,114±17,257	66,211±9,318	66,009±6,745	32,895±4,563
No	64	151,578±20,036	59,188±9,189	62,063±8,851	30,328±4,922
t=		4,736	4,849	3,339	3,500
p=		0,000	0,000	0,001	0,001

When the data in Table 7 was investigated the students' 21st-century skills competence total, learning and renewal skills, life and career skills, information media and technology skills scores do not differ significantly according to gender ( $p > 0.05$ ). Students' century skills competence total, learning and renewal skills, life and career skills, information media and technology skills scores do not differ significantly according to grade ( $p > 0.05$ ). The students' 21st-century skills competence total scores differ significantly according to the mother's education level ( $F = 3.762$ ;  $p = 0.006 < 0.05$ ;  $\eta^2 = 0.080$ ). The reason for the difference is that 21st-century skills competence total scores of those whose mother's education level is primary school are higher than the 21st century skills competence total scores of those whose mother's education level is illiterate ( $p < 0.05$ ).

The learning and renewal skills scores of the students differ significantly according to the educational status of the mothers ( $F = 3.336$ ;  $p = 0.012 < 0.05$ ;  $\eta^2 = 0.072$ ). The reason for the difference is that the learning and renewal skills scores of those whose mother's education level is primary school are higher than the learning and renewal skills scores of those whose mother's education level is illiterate ( $p < 0.05$ ). The learning and renewal skills scores of those whose mother's education level is associate's degree and undergraduate are higher than the learning and renewal skills scores of those whose mother's education level is illiterate ( $p < 0.05$ ). Students' information, media and technology skills scores differ significantly according to their mother's education level ( $F = 3.887$ ;  $p = 0.005 < 0.05$ ;  $\eta^2 = 0.082$ ). The reason for the difference is that the information media and technology skills scores of those whose mother's education level is primary school are higher than the information media and technology skills scores of those whose mother's education level is illiterate ( $p < 0.05$ ). The information media and technology skills scores of those whose mother's education level is high school are higher than the information media and technology skills scores of those whose mother's education level is illiterate ( $p < 0.05$ ). The information media and technology skills scores of those whose mother's education level is associate's and bachelors degree are higher than the information media and technology skills scores of those whose mother's education level is illiterate ( $p < 0.05$ ). The life and career skills scores of the students do not differ significantly according to the mother's education level ( $p > 0.05$ ).

The students' 21st-century skill competence total, learning and renewal skills, life and career skills, information media and technology skills scores do not differ significantly according to their father's education level ( $p > 0.05$ ). The learning and renewal skills scores of the unemployed ( $x = 62,496$ ) were found to be lower than the learning and renewal skills scores of the employed ( $x = 65,657$ ) ( $t = -2.096$ ;  $p = 0.038 < 0.05$ ;  $d = 0.324$ ;  $\eta^2 = 0.024$ ). Students'

21st century skills competence total, life and career skills, information media and technology skills scores do not differ significantly according to their employment status ( $p>0.05$ ).

The century skills competence total scores of those who did creative activities ( $x=165.114$ ) were higher than those who did not do creative activities ( $x=151,578$ ) ( $t=4.736$ ;  $p=0.05$ ;  $d=0.740$ ;  $\eta^2=0.113$ ). The learning and renewal skills scores of those who did creative activities ( $x=66,211$ ) were higher than those who did not engage in creative activities ( $x=59,188$ ) ( $t=4.849$ ;  $p=0.05$ ;  $d=0.757$ ;  $\eta^2=0.118$ ). The life and career skills scores of those who do creative activities ( $x=66.009$ ) were found to be higher than those who do not engage in creative activities ( $x=62,063$ ) ( $t=3.339$ ;  $p=0.001<0.05$ ;  $d=0.522$ ;  $\eta^2=0.060$ ). Information media and technology skills scores of those who engage in creative activities ( $x=32,895$ ) were found to be higher than those who did not engage in creative activities ( $x=30,328$ ) ( $t=3,500$ ;  $p=0.001<0.05$ ;  $d=0.547$ ;  $\eta^2=0.065$ ).

## **CONCLUSION and DISCUSSION**

Creative personality total, goal orientation, inner motivation, self-confidence, risk taking scores, and 21st century skills proficiency total scores and sub-learning dimensions; It was found that there was a positive correlation between the scores of learning and renewal skills, life and career skills, information media and technology skills. While the highest correlation is between creative personality total scores and 21st century skills proficiency total scores, the lowest correlation is between self-confidence sub-dimension and information media and technology skills scores. The regression analysis performed to determine the cause-effect relationship between creative personality total and century skills proficiency total was found to be significant.

In Kavukcu's (2021) research, which aimed to examine the views of science teachers on problem-solving, entrepreneurship and 21st-century skills self-efficacy levels; it has been determined that science teachers' 21st-century skills self-efficacy perceptions, entrepreneurship levels and problem-solving averages were quite high, science teachers' entrepreneurship levels do not differ according to their gender, education status, and length of service, and science teachers' problem-solving levels don't differ according to their gender, educational status and length of service. In Korkmaz's (2019) research, which aims to determine classroom teachers' lifelong learning tendencies, their level of possession of life skills and 21st century skills levels and to reveal the relationship between them; It has been determined that the lowest average was "Motivation" in the sub-dimensions of Lifelong Learning Tendency of primary school teachers, the highest average was "Deprivation in Organizing Learning", and the level of 21st Century Teacher Skills of the teachers was above the average.

The regression analysis conducted to determine the cause-effect relationship between goal orientation, inner motivation, self-confidence, risk taking and 21st century skills proficiency total scores, learning and renewal skills, life and career skills, information media and technology skills scores was found to be significant. Dogan (2020), in his study which aimed to examine the curriculum of the 9th, 10th, 11th and 12th grades of Turkish language and literature, philosophy, religious culture and ethics, geography, history and English at the secondary education level which started to be implemented in primary and secondary education as of 2018-2019 academic year,

within the framework of the determined 21st-century skills, and to determine the opinions of teachers on these skills; It has been found that the school success average has no effect on teachers' opinions about 21st-century skills, they have common opinions about 21st-century skills, and they have deficiencies in both practice and knowledge about 21st-century skills. Ceylan (2019) in his research, which aimed to examine the changing roles of school administrators in the new century in the context of 21st-century skills; describes the views of teachers in the dimensions of "Learning and Innovation Skills", "Information, Media and Technology Skills" and "Life and Career Skills"; it has been determined that school administrators with 21st-century skills are more successful in management and this success is also reflected in school success, and therefore questions to identify 21st-century skills in school management exams should be included and attention should be paid to these skills in interviews; also they need to be supported with in-service trainings in the following processes.

Inner motivation, risk taking and goal orientation increase the 21st century skills proficiency total score at a high level. Inner motivation increases the level of learning and renewal skills at a high level. Inner motivation increases the level of life and career skills at a high level. The creative personality total scores, goal orientation, inner motivation, self-confidence, and risk taking scores of primary school prospective teachers do not differ significantly according to gender, grade level, mother's education level and working status.

The inner motivation scores of the primary school prospective teachers differ significantly according to the educational status of the father. The reason for the difference is that the inner motivation scores of those whose father's education level is middle school and high school are higher than those whose father's education level is primary school. Inner motivation scores of those whose father's education level is middle school and high school are higher than those whose father's education level is associate degree and undergraduate.

The creative personality total, goal orientation, self-confidence, and risk taking scores of the students do not differ significantly according to their father's education level. Creative personality total scores, goal orientation scores, inner motivation scores, self-confidence scores of those who did activities to increase creativity were found higher than those who did not do activities to increase creativity. Risk taking scores of primary school prospective teachers do not differ significantly according to their creativity activities.

The total 21st century skills proficiency, learning and renewal skills, life and career skills, information media and technology skills scores of primary school prospective teachers do not differ significantly according to gender, grade level, father's education status and working status. 21st century prospective teachers. learner skills and 21st century. The use of teacher skills differs in terms of university, department and university, department variables (Goksun Orhan & Kurt, 2017). It has been determined that prospective teachers have sufficient level of 21st century skills and sub-dimensions. There was no significant difference between gender and department variables and 21st century skills (Erten, 2019). Cemaloglu et al. (2019) in their research, which aimed to determine vocational high school teachers', working in Ankara, self-efficacy perceptions after the training they received for 21st-century skills and to examine them in terms of various variables; they found that teachers of

the 21st-century skills proficiency perceptions didn't differ according to gender, educational status, and professional seniority and younger teachers were at a higher level than other teachers in the "learning and renewal skills" sub-dimension. Gurultu et. al. (2020) in their research aiming to determine whether the competencies of using 21st century skills of secondary school teachers working in different provinces of Turkey and in different branches differ according to various demographic variables; teachers working in secondary education are thought to have 21st century teacher skills at a high level, no difference was found in terms of gender in teachers' use of 21st century teacher skill; when the 21st-century skills of teachers were considered in terms of years of service, secondary school teachers' use of 21st-century teacher skills; did not differ in the overall scale and in managerial and techno pedagogical sub-dimensions; however, it differs in the sub-dimensions of Approval, Flexible Teaching and Productive Skills, teachers' 21st century skills usage according to the faculty they have graduated from; the scale differs in the Technopedagogical and Flexible Teaching Skills sub-dimensions, but does not differ in the other sub-dimensions; when the use of 21st-century teacher skills by teachers were considered from the point of view of the institution where the teachers work; they found that teachers working in Anatolian Imam Hatip High School (AHL) scored higher in the overall, Administrative, Technopedagogical, Flexible Teaching and Productive Skills sub-dimensions of the scale. In Demir (2020)'s research, which aimed to examine the effects of teachers' democratic behaviors and reflective thinking tendencies on the level of teaching 21st century skills; it was found that teachers' democratic behaviors, reflective thinking tendencies, and teaching 21st-century skills were at a sufficient level and there was no significant difference according to their seniority.

In the research of Cinar (2019), which aimed to examine secondary school teachers' perceptions and views on 21st century skills; it has been determined that there is a significant difference in favor of male teachers in the Learning and Renewal dimension according to the gender variable, In the Information, Media and Technology skills sub-dimension according to the seniority variable, the teachers with 10-15 years of experience have more efficacy perceptions than the teachers with a seniority of 21 and above; there is no significant difference in terms of education level and branch, and that teachers who always use social media have more efficacy perceptions than those who use social media frequently. In Karabekmez's (2021) study which aimed to determine the relationship between critical thinking skills; it has been found that there is no significant difference between classroom teachers' use of 21st century teaching skills and the variables of gender, education status and seniority of classroom teachers, there is no significant difference between critical thinking skills and gender variables, it has also been determined that there is a significant difference between classroom teachers working between 6-10 years and classroom teachers working between 11-15 years and 16-20 years according to the seniority variable of classroom teachers' critical thinking skills.

The 21st century skills proficiency total scores, learning and renewal skills scores, life and career skills scores, and information media and technology skills scores of those who did activities to increase creativity were found to be higher than those who did not do activities to increase creativity. In Barasi (2020)'s study conducted in 2018, 21st century skills in the secondary school Turkish lesson curriculum and Turkish teachers' views on 21st century skills in the curriculum were analyzed, it was found that: communication and cooperation, social and cultural

interaction skills were the most included in the program level according to teachers' views; the least included were accountability, learning to learn, self-direction skills, communication, cooperation, social and intercultural interaction skills were realized the most, and the least realized skills were creativity, accountability, learning to learn, self-direction skills, the most preferred activities by teachers in order to bring 21st-century skills to their students in their classes were drama, creative writing, group work and presentation skills.

## RECOMMENDATIONS

In this context, it can be suggested to carry out activities to improve the creativity of prospective teachers who will raise the new generation so that they can develop their 21st century skills. One of the most important issues is how to gain and develop 21st century skills. It is stated in different reports and researches that it is possible to gain 21st century skills by integrating them with lessons. On the other hand, it is stated that these characteristics can be gained through studies outside of school. In this context, it is understood that teachers have a vital role in gaining these skills. Teachers can help the acquisition of these skills with the activities, methods and strategies they use in school and out of school(Cansoy, 2018). Lessons for the development of creativity can be added to classroom teacher training programs. In order for creativity to develop from early childhood, education of parents can be emphasized. The research can be carried out with students at different levels or with prospective teachers in different branches by adopting a qualitative, quantitative or mixed working approach. Longitudinal studies can be conducted to develop the creativity of undergraduate students and to determine the effect of creativity on 21st century skills.

## ETHICAL TEXT

"In this article, the journal writing rules, publication principles, research and publication ethics, and journal ethical rules were followed. The responsibility belongs to the author for any violations that may arise regarding the article. "Ethical permission was obtained from the 2021 Inonu University Social and Humanities Scientific Research Ethical Committee for this research.

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