



The Mediating Role of Reflective Thinking between Preschool Teachers' Personality Traits and 21st-Century Skills*

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| Article Information | ABSTRACT |
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| <p><i>Received:</i> 01.09.2023</p> <p><i>Accepted:</i> 31.10.2024</p> <p><i>Online First:</i> 21.01.2025</p> <p><i>Published:</i> 31.01.2025</p> | <p>The radical changes in technology, education, and social life have resulted in changes in individuals' personality traits, thinking styles, and skills. Teachers have a primary role in adapting children to these changing conditions. The educational opportunities offered in the early years can ensure that children are equipped with the knowledge and skills required by the 21st century, shaping their personality traits in this direction and developing reflective thinking skills. Within this context, the importance of preschool teachers, whom the child encounters and takes as a model other than family members, comes to the fore. The present study examines the mediating effect of reflective thinking tendencies on the relationship between preschool teachers' personality traits and 21st-century skills. This research aimed to test the mediating role of reflective thinking between preschool teachers' personality traits and their 21st-century skills, revealing the relationships between these variables. Therefore, path analysis from structural equation models was preferred. According to the findings of the study, reflective thinking was found to be a full mediator between "extraversion" and 21st-century skills. Reflective thinking was found to be a partial mediator between personality types "openness to development" and "self-control" and "neuroticism" and 21st-century skills. There is a positive relationship between 21st-century skills and openness to experience and self-control.</p> <p>Keywords: 21st-century skills, reflective thinking, personality</p> |
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1. INTRODUCTION

The technological changes in today's world bring innovation and development in many areas of people's lives. The skills required for individuals to adapt to these changes as a result of the technological changes brought by the age, to follow technological developments, to select and analyze what they need as a result of intensive information production, and to transform this information into products in daily life are called 21st-century skills (Anagün et al., 2015; Harari, 2018; Orhan Gökşün & Kurt, 2017). 21st-century skills are like an umbrella concept that gathers all skills under it (Dede, 2010).

According to Trilling & Fadel (2009), the main purpose of 21st-century skills is to encourage creative thinking by supporting individuals to adapt to these changes and developments. Although there are different classifications of 21st-century skills, the most widely accepted in the literature are the three basic categories created by P21. Based on this, the first category is the category of learning and renewal skills, which includes skills such as creative thinking, problem-solving, communication, critical thinking, and innovation. The second category is life and career skills, covering skills such as taking responsibility, productivity, entrepreneurship, and leadership. The last category is the information, media, and technology skills category, which is different from general literacy and includes media, information communication technologies, and information literacy (P21, 2009). When these categories are analyzed, it is seen that 21st-century skills include knowledge and practice together (Dede, 2010; New Media Consortium, 2005). Without a doubt, the most important way for individuals to acquire these skills is through education. Because the main purpose of education is to facilitate the daily lives of individuals and prepare them for the future. The way to

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keep up with the constantly developing technology is for individuals to become constantly open to learning (Anderson & Dron, 2011; Añonuevo et al., 2001). Besides their peers and parents, teachers are the people that children are in contact with the most. Consequently, it is the responsibility of teachers to provide 21st-century skills to children (Anagün et al., 2016). Effective educators understand that students require advanced thinking and problem-solving skills for learning (Silva, 2009). The cultivation of skills essential for the 21st century, such as critical thinking, collaboration, and adaptability, is influenced by an individual's personality traits, with research suggesting that certain personality characteristics, such as openness to experience and conscientiousness, are positively associated with the acquisition and application of these skills (Di Fabio & Kenny, 2019; Poropat, 2009). Therefore, the personality characteristics of teachers are important in acquiring and applying these skills.

Personality is a structured type of relationship with both internal and external environments distinguishing people from other people. It refers to the whole of the individual's thought and emotion patterns that are unique to him/her, permanent in independent situations and time (Morris, 2002). "The Five-Factor Personality" theory is the theory that classifies personality traits universally based on observation. Used most frequently in the literature to classify personality, this theory handles personality as extroversion, neuroticism, self-control, agreeableness, and openness to development (Merdan, 2013; Horzum et al., 2017).

Those with extraverted personalities are cheerful, interesting, witty, sociable, energetic, sympathetic, talkative, lively, assertive, successful in human relations, excited, do not have difficulty in expressing their emotions, do not hesitate to engage in new social environments, and humorous (Çivitci & Arıcıoğlu, 2012; McShane & Von Glinow, 2005; Somer, 1998). People with neurotic personalities are those who experience emotional ups and downs, are sad, fearful, anxious, impatient, restless, unsuccessful in managing human relations, exhibit behavioral disorders, and have a feeling of guilt (Bruck & Allen, 2003; Costa & McCrae, 1995). People who have adaptive personalities are the ones who can work with groups, are kind, forgiving, tolerant, reassuring, flexible in their thoughts, have a good temperament, sincere, mild-mannered, and easily trust people. Self-controlled personality is characterized by high self-control and desire to succeed, orderly, disciplined, determined, committed, organized, taking their work seriously and punctual (Costa & McCrae, 1995). On the other hand, people who have a personality open to development are those who have a desire for continuous self-improvement, love reading, traveling, researching, and exploring, have a developed imagination, think in multiple ways, are cultured, and have an artist's sensitivity, are eager to learn, and are open to innovation and change (McCrae & John, 1992; Şencan, 2003).

One of the basic skills of teachers supporting them to have 21st-century skills as well as their personality traits is reflective thinking. Characteristics such as farsightedness, open-mindedness, sincerity, responsibility and openness to criticism are among the personality traits of reflective thinkers (Williams & Grudnoff, 2011). John Dewey is the most important name in the history of reflective thinking. Dewey (1910) described reflective thinking as a deliberate process of searching for the foundation of a belief and assessing the adequacy of the existing basis to uphold that belief. He emphasized the dynamic nature of knowledge, asserting that 'nothing remains the same. Reflective thinking is a process related to problem solving. It is a thinking skill aimed at finding solutions by identifying positive and negative situations that individuals encounter in the education process (Ünver, 2021). Times change, people change, and everything changes... If teachers are not reflective teachers, if they cannot adapt to these changes, they cannot be effective. Teachers have to be ready and willing to adapt to these changes (Moon, 2004). For Schön (1983), reflexive thinking includes two types of knowledge; the knowledge that is readily available and the knowledge obtained from experiences between reflection and action. Experiential knowledge refers to the knowledge that is formed while the teacher and the student are doing something, thinking about it, questioning it, reconsidering what they have done, and reorganizing themselves accordingly. Thanks to reflection, educators and students can draw lessons from their practices, wrong information is eliminated, and their ability to adapt to uncertain and unique situations is improved. Reflective thinking enables teachers to act systematically, be inquisitive, research, and produce solutions (Alp & Taşkın, 2008). Teachers' self-development by applying reflective thinking is also important in terms of conducting the education process more democratically. If teachers can reflect on teaching practices and change these practices in line with student needs, they will not have to stick to predetermined patterns (Galea, 2010).

In the literature, several studies have explored the reflective thinking skills and tendencies of teachers and pre-service teachers across various disciplines (Aslan, 2009; Bayrak & Koçak-Usluel, 2011; Gedik et al., 2014). One study indicates that teachers' personality traits influence their emotional experiences (Berkovich & Eyal, 2021). Another study examined the significance of personality traits in developing more effective teaching and learning strategies, specifically focusing on the relationship between teachers' personality traits and student motivation (Khalilzadeh & Khodi, 2021). The importance, effect, and relationship of personality traits with different variables related to teachers' personality traits are investigated (Mustafa et al., 2022; Hashmi & Naz, 2020; Istiyono et al., 2021). In addition to these, some studies reveal teachers' levels of 21st century skills (Atış-Akyol, 2023), studies that aim to develop 21st century skills (Urbani et al., 2017) and studies that determine the variables associated with 21st century skills (Kuloğlu & Karabekmez, 2022). In today's changing and developing world, teachers having 21st century skills will contribute to the quality of education and training. For this reason, it is extremely important to reveal the variables related to supporting teachers' 21st century skills. Considering that personality traits of an individual are important in determining their mental state and behaviors, it is thought that investigating the relationship between personality traits, 21st century skills and reflective thinking will contribute to the literature as an important source of information that will guide teacher training policies. The fact that the study aims to fill a gap in the literature by examining the relationship between teachers' personality traits and their level of having some skills that are among the requirements of our age makes the study

important. On the other hand, the fact that the teachers in the sample do not represent different regions equally can be considered as a limitation of the study.

1.1. Purpose of the Study

The purpose of this study was to examine whether reflective thinking tendencies had a mediating effect regarding the effect of preschool teachers' personality traits on 21st century skills. In line with the purpose of the research, a model that determined the relationships between the variables was proposed. The hypothesis model tested in the study is shown in Figure 1.

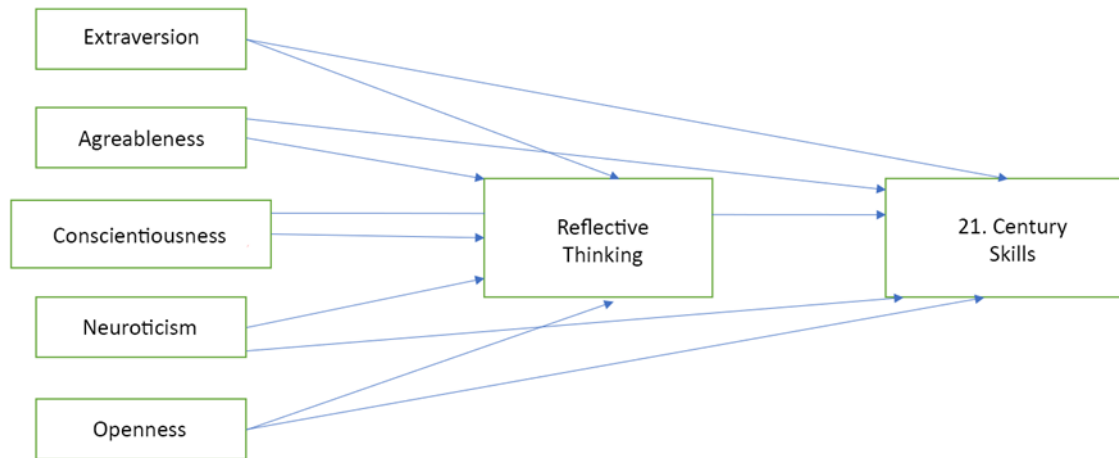


Figure 1. Hypothesis Model

1.2. Problem of the Study

The following questions guided this study:

Is there a relationship between the big five personality traits (extraversion, agreeableness, conscientiousness, neuroticism, and openness) and preschool teachers' 21st-century skills? Additionally, does reflective thinking serve as a mediator between the big five personality traits and preschool teachers' 21st-century skills?

2. METHODOLOGY

The current study was designed using a relational survey model, which is one of the quantitative research methods. Relational research provides the researcher with the opportunity to explain the relationship between variables and predict possible outcomes (Christensen et al., 2014). This research aimed to test the mediation of reflective thinking between preschool teachers' personality traits and 21st-century skills and tried to reveal the relationships between variables. Therefore, path analysis from structural equation models was preferred. Path analysis is defined as an advanced statistical technique in relational research (Schumacker & Lomax, 2004). The direct and indirect effects between variables and the significance of these effects can be examined by path analysis (Leclair, 1981). In other words, path analysis is a powerful method that tests the possibility of a causal connection between three or more variables (Fraenkel & Wallen, 2009).

2.1. Participants

While the population of the research consists of pre-school teachers working in pre-school education institutions in Turkey, the sample consists of 343 volunteer pre-school teachers where pre-school teachers participate and who agreed to fill out the measurement tools. A random sampling method was employed in the study. Random sampling is a type of sampling in which all units and individuals in the universe have an equal probability of being selected for sampling (Cohen et al., 2007). The research data collection tools were transformed into an online form and the data were collected online. All of the preschool teachers participating in the study held bachelor's degrees 94.5% of them were female and 5.5% were male. In addition, 59.1% of the teachers were between 20-30 years old, 31.6% were between 31-40 years old, and 9.3% were over 41 years old. Of the teachers participating in the study, 66.7% had a seniority of 1-10 years, 29.6% had a seniority of 11-20 years, and 3.7% had a seniority of 21 years or more.

2.2. Data Collection Tools

2.2.1. Demographic information form

Data on gender, age, and professional seniority of preschool teachers were obtained using the demographic information form developed by the researchers.

2.2.2. Five-Factor Personality Scale

The 44-item scale developed by Benet-Martinez & John (1998) measuring five basic personality traits was transformed into a 10-item version by Rammstedt & John (2007). The adaptation study of the scale into Turkish was conducted by Horzum et al. (2017). The scale consists of 5 sub-dimensions with 10-item that determine 5 personality types in a 5-point Likert type (1 - Strongly disagree; 5 - Strongly agree). The internal consistency reliability coefficient Cronbach's Alpha values of the sub-dimensions were determined as extraversion .88, agreeableness .81, conscientiousness .90, neuroticism .85, and openness .84 respectively (Horzum et al., 2017).

2.2.3. Reflective Thinking Tendency Evaluation Scale

Reflective Thinking Tendency Evaluation Scale developed by Semerci (2007), the scale consists of 35 items, 20 of which are negative and 15 of which are positive. The items were rated on a 5-point Likert scale (1 - Strongly disagree, 5 - Strongly agree). The 35 items in the scale consist of seven themes based on reflective thinking. These themes involve continuous and purposeful thinking, open-mindedness, inquisitiveness, effective teaching, responsibility, scientific investigation, foresightedness, sincerity, and a professional perspective. The reliability coefficient Cronbach Alpha value of the scale is 0.90 (Semerci, 2007).

2.2.4. 21st-Century Learner Skills Utilisation Scale

21st-century Learner Skills Utilisation Scale, developed by Orhan Göksün & Kurt (2015), the scale is a 5-point Likert scale (1 - Strongly disagree, 5 - Strongly agree). The scale comprises 31 items divided into four factors: cognitive skills, autonomous skills, cooperation and flexibility skills, and innovation skills. The internal consistency coefficient of the scale is .89.

2.3. Data Collection Process

Sivas Cumhuriyet University Education Ethical permission was obtained from the Research Proposal Ethics Evaluation Board of Sciences Research Proposal Ethics Evaluation Board dated 27/02/2023 and numbered 269505 and the research data were collected on a voluntary basis. The data were collected online in April and May 2023.

3. FINDINGS

The present study aims to examine whether there is a mediating effect of reflective thinking tendencies on the effect of individuals' personality traits on 21st-century skills. In this context, the path analysis method with observed variables, which is a type of structural equation model, was used to test the relationships between variables and the mediating effect. The primary purpose of path analysis is to enable the comparison of direct and indirect effects between variables (Schumacker & Lomax, 2004). Initially, there should be a significant relationship between the variables in the model for path analysis, and this relationship is shown in Table 1.

Table 1.
Table of Correlation Between Variables

| | Mean | Sd | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-----------------------------------|--------|-------|---------|---------|---------|---------|--------|--------|---|
| 1. Extraversion | 8.26 | 1.57 | 1 | | | | | | |
| 2. Agreeableness | 8.41 | 1.14 | .130* | 1 | | | | | |
| 3. Conscientiousness | 8.48 | 1.30 | .339** | .245** | 1 | | | | |
| 4. Neuroticism | 4.78 | 1.54 | -.275** | -.378** | -.280** | 1 | | | |
| 5. Openness to development | 7.83 | 1.49 | .287** | .131* | .212** | -.219** | 1 | | |
| 6. Reflective thinking | 154.98 | 9.46 | .349** | .219** | .392** | -.296** | .315** | 1 | |
| 7. 21st Century Skills | 126.06 | 10.55 | .352** | .135* | .436** | -.346** | .394** | .652** | 1 |

**p<.01; *p<.05

The relationship between the variables was analyzed by Pearson correlation. This method is a parametric method and data distribution should be normal for all variables. According to Tabachnick & Fidell (2013), data distribution is normal when skewness and kurtosis values for continuous data are between -1 and +1. Skewness and kurtosis values for all variables are in this range. The relationship between the dependent variable (21st-century skills) and the mediating variable (reflective thinking) and the independent variables was statistically significant. Moreover, there is a significant relationship between the mediator variable and the independent variables and the assumption is ensured.

RMSEA (Root Mean Square Error of Approximation), CFI (Comparative Fit Index), TLI (Tucker-Lewis Index), and SRMR (Standardised RMR) fit indices are 4 fit indices included in the Mplus program. Model data fit is shown in Table 2.

Table 2.
Findings Related to Fit Indices

| Index | Perfect Fit | Good Fit | Finding | Result |
|-------|-------------------------|------------------------|---------|-------------|
| RMSEA | .00 ≤ RMSEA ≤ .05 | .05 ≤ RMSEA ≤ .10 | .000 | Perfect Fit |
| CFI | .95 ≤ CFI ≤ 1.00 | .90 ≤ CFI ≤ .95 | 1 | Perfect Fit |
| TLI | .95 ≤ NNFI (TLI) ≤ 1.00 | .90 ≤ NNFI (TLI) ≤ .95 | 1 | Perfect Fit |
| SRMR | .00 ≤ SRMR ≤ .05 | .05 ≤ SRMR ≤ .08 | .000 | Perfect Fit |

(Source: Schumacker & Lomax, 1996)

Based on Table 2, compatibility indices (RMSEA=.000, CFI=1.00, TLI=1.00, SRMR=.000) were obtained and the data showed an excellent fit to the model (Kline, 2005; Hu & Bentler, 1999). The results of the path analysis are shown in Figure 2 and significance was calculated at $p < .05$ level. The results of the mediation analysis are presented in Table 3.

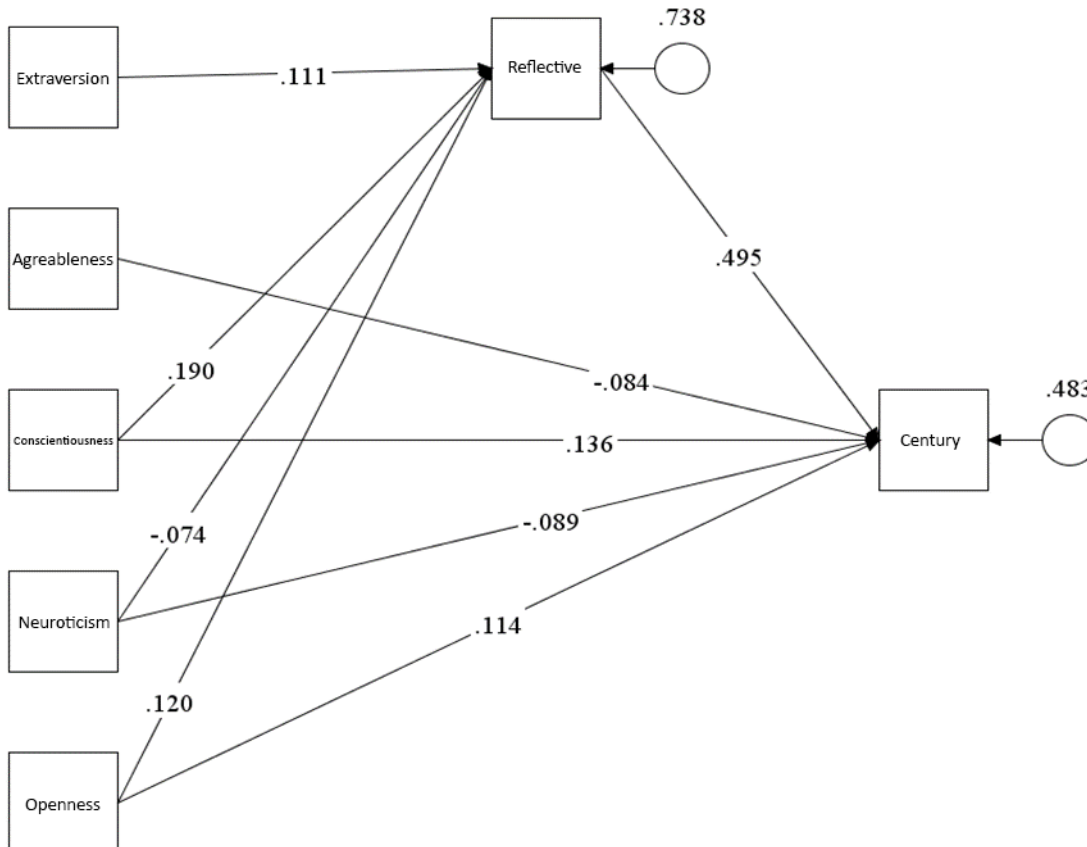


Figure 2. Path Analysis Model

Table 3.
Mediating Effect of Reflective Thinking Tendency

| Independent Variables | 21st Century Skills (Dependent Variable) | | |
|-------------------------|--|----------|----------|
| | Total | Indirect | Direct |
| Extraversion | 0.084** | 0.055** | 0.029 |
| Agreeableness | -0.054 | 0.030 | -0.084* |
| Conscientiousness | 0.230** | 0.094** | 0.136** |
| Neuroticism | -0.125** | -0.037** | -0.089** |
| Openness to Development | 0.173** | 0.059** | 0.114** |

** $p < .01$. * $p < .05$

There are several opinions on mediation analysis in the literature. If the relationship between the dependent and independent variables without the mediating variable in the model loses its statistical significance when the mediating variable enters the model, there is full mediation; if it does not lose its significance but there is a significant decrease, then there is partial mediation (Baron & Kenny, 1986). Accordingly, the mediating effect of the extraversion sub-dimension on reflective thinking tendency and 21st-century skills ($B=0.055$) is statistically significant ($p < .05$). The total effect between extraversion and 21st-century skill ($B=0.084$) lost its statistical significance through reflective thinking tendency ($B=0.029$, $p > .05$) and therefore there is full mediation. The mediating effect of reflective thinking tendency for adaptability sub-dimension is not statistically significant ($B=0.030$, $p > .05$). The effects of self-control ($B=0.094$), neuroticism ($B=-0.034$) and openness to improvement ($B=0.059$)

dimensions on 21st-century skills through reflective thinking tendency are statistically significant ($p < .05$) and there is partial mediation.

When reflective thinking tendency, which is the mediating variable for all these variables, is included in the model, the direct effect is statistically significant and decreased compared to the total effect.

4. RESULTS, DISCUSSION AND RECOMMENDATIONS

The findings of the research revealed that reflective thinking is a full mediator between “extraversion”, one of the personality types, and 21st-century skills. As Dewey stated, interacting with others is very important for reflective thinking skills (Rodgers, 2002). This draws attention to the relationship between extraversion and reflective thinking. At the same time, Dewey also states that reflective thinking requires attitudes that care about the personal and intellectual development of oneself and others (Rodgers, 2002). Communication and collaboration skills are among the skills that individuals need to acquire through education in the 21st century. With these skills, it is aimed to raise individuals who can benefit from information resources, cooperate and respect differences (Trilling & Fadel, 2009). Gelen (2017) stated in his study that individuals with social and intercultural skills, which are one of the 21st century skills, are individuals who know when to speak and listen, are open-minded towards different ideas and values, respect different cultures, and can express themselves respectfully and correctly. In this context, it can be said that the extraversion personality type and 21st century skills such as communication, cooperation, and social and intercultural skills are closely related.

In the literature, studies that establish a direct relationship between “extraversion” and “21st-century skills” are insufficient, and some structural models that examine the relationship between academic performance are found (Chamorro-Premuzic & Furnham 2003; Furnham et al. 2009; Hakimi et al. 2011; Khalilzadeh & Khodi, 2021; Thiele et al., 2018). Academic achievement is not a separate category within the skills required for the 21st century; however, it serves as a significant predictor of learning and innovation skills, life and career skills, as well as media and technology skills (P21, 2008). Extraversion has also been found to be associated with different characteristics and skills in the literature. It is stated that individuals with an extraverted personality type generally exhibit more social behaviors (Breil et al., 2019), have high levels of entrepreneurship and social interest (Duffy et al., 2009), and have high problem-solving skills (Somer et al., 2011).

Reflective thinking was found to be a partial mediator between personality types “openness to development”, “self-control”, “neuroticism” and 21st-century skills. There is a positive relationship between 21st-century skills and openness to development and self-control. Reflective teachers can make sense of experiences, think in a disciplined way, communicate and share with others, and constantly review their teaching goals, methods, and materials. In addition, they have personality traits of reflective thinkers such as farsightedness, open-mindedness, sincerity, responsibility, and openness to criticism (Rodgers, 2002; Williams & Grudnoff, 2011). According to Khan (2016), education aims to train a new workforce that is creative, curious, self-directed, and self-directed, who can learn new things throughout their lives, find new ideas, and implement them. In parallel with the research findings, Köstekçi (2016) found a positive relationship between entrepreneurship, one of the 21st-century skills in his study, and reflective thinking skills. In the study Aslanoğlu (2019) conducted with a group of university students, he shared the result that people with high entrepreneurship skills also have high reflective thinking skills in parallel. Also, there is a negative relationship between 21st-century skills and neuroticism in the study. It is stated in the literature that there is a negative relationship between academic performance and neuroticism (Chamorro Premuzic & Furnham 2003; Hakimi et al., 2011). In parallel with the research finding, the openness to experience personality trait was found to predict thinking styles (Tortop et al., 2012).

According to Alp & Taşkın (2008), reflective thinking is very important for teachers. Because it is reflection skills enable teachers to act systematically, be inquisitive, research, and produce solutions. Similarly, Dewey (1933) emphasized that personality traits such as openness-minded and responsible are necessary for reflective thinking. Orman (2021) revealed in his study that there is a significant positive relationship between cognitive flexibility, one of the 21st-century skills of secondary school students, and reflective thinking skills for problem-solving. Evin Gencil & Güzel Candan (2015) found a significant positive relationship between the critical thinking tendencies and reflective thinking levels of prospective teachers. Moreover, Demir (2020) shared the result that teachers’ democratic behaviors and reflective thinking tendencies are significant predictors of 21st-century skills. Therefore, it is supported by the literature that reflective thinking mediates the relationship between extraversion, openness to development, self-control, neuroticism, and 21st-century skills. Salinas and Quines (2022) concluded that the teachers in their study had high levels of positive personality traits and reflective thinking. Reflective thinking skills are linked to teachers’ personality traits. Reflective capacity is a result of the teacher developing the ability to reflect, which in turn enables the teacher to develop the basics of being empathetic and thinking critically. Through reflective teaching skills, teachers are more involved in problem-solving situations because they learn to think critically and look at different perspectives that can lead to the best results (Salinas & Quines, 2022).

Teachers have an important role in adapting to a changing and developing world. In particular, teachers of preschool children, who have critical importance for development, need to adapt to 21st-century skills with both learner and teacher identities. Based on the results obtained from the research, regardless of the personality traits of the teachers (openness to development, self-control, neuroticism, extraversion), reflective thinking takes place as a mediating variable in their relationships with 21st-

century skills. This information reveals that the development of reflective thinking skills should be emphasized to support teachers' 21st-century skills. Thus, it is important to have courses to develop reflective thinking skills both in the programs to be prepared for the personal and professional development of teachers and in teacher training programs. It is recommended to conduct further research with larger samples on the impact of reflective thinking on teaching practices with early childhood education teachers. Examining the relationship between reflective thinking and other variables such as personality types and 21. century skills can be considered as ways to realize reflective thinking and teaching practices in teaching and learning environments.

Research and Publication Ethics Statement

Throughout the research process, the researchers conformed to all ethical standards. The data collected from the participants have not been used outside the scope of the present study and the reporting process was also carried out according to the guidelines for research ethics.

Contribution Rates of Authors to the Article

The authors provide equal contributions to this work.

Statement of Interest

There is no conflict of interest.

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