Analysis of Postgraduate Theses on Analytical Thinking in Türkiye

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Abstract: This study aims to examine postgraduate studies on analytical thinking in Türkiye. Using the descriptive content analysis method, postgraduate studies on analytical thinking skills were examined and arranged, and general trends in the field were determined. The YÖK national database was searched using the keyword "analytical thinking." Studies on the subject were examined according to the year, publication language, study group, type of study, subject associated with analytical thinking skills, research method, measurement tool, and quantitative analysis techniques. According to the results obtained, it was observed that postgraduate research on analytical thinking skills started in 2009 and increased in 2021. It is understood that the studies are primarily carried out with secondary school and university students. One study was found with high school students and teachers. There are no studies conducted with pre-school and primary school students. Most of the studies are at the graduate level. Analytical thinking skills are discussed in topics such as Conceptual understanding, Context-based learning, Critical thinking, Life skills, Mathematical problem solving, Personnel factors, and STEM. It was understood that a large proportion of the studies examined were in the type of quantitative research. No study is only in the type of qualitative research. Studies need to investigate the relationship between analytical and higher-order thinking skills such as creative thinking, reasoning, and practical thinking.

Keywords: Analytical Thinking, Descriptive Analysis, Graduate Theses

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Introduction

Rapidly changing living conditions require each individual to receive education in line with the needs of the age. It is predicted that many young people will have professions other than the ones that exist today. Individuals need to be equipped with life skills to maintain competitiveness, support production skills and do practical work for humanity. In this context, acquiring high-level thinking skills for students can improve individuals' ability to think and act independently. It is observed that the education programs developed by the countries aim to provide students with high-level thinking skills such as critical thinking, creative thinking, analytical thinking, reflective thinking, argumentation, reasoning, and problem-solving (Noroozi 2018, 2022; Noroozi et al., 2020; Valero Haro et al., 2019; 2022). It has been emphasized that individuals should have critical and analytical

thinking skills to maintain a thriving social and business life today and in the near future (Akar, 2020; Feyzioglu, 2019; Paziotopolos & Kroll, 2004; Yurt, 2022). This research is aimed to examine the postgraduate studies on analytical thinking skills in Türkiye.

Analytical thinking skills are among high-level thinking skills (Krathwohl, 2002). The ability of students to carry out a valid scientific study depends on their effective use of analytical thinking skills. Because analytical thinking is necessary for examining the problem, determining the solutions, revealing the relations between the parts and making effective decisions. Bloom's taxonomy has provided an essential approach to understanding and defining higher-order thinking skills. There are six steps in taxonomy: remembering, understanding, applying, analysis, evaluation, and synthesis. The analysis step elaborates the preceding steps of remembering, understanding and applying. This step is the predecessor of the evaluation and synthesis steps after it.

One of the primary purposes of education is to enable students to use scientific processes correctly. In this way, it will be possible for them to access the correct information and use the information they access effectively. In the scientific process, students observe, describe and test events. Students with analytical thinking skills make better observations in the scientific process, see the relationships between the parts more efficiently, and better understand the role of each part in the whole. Developing analytical thinking skills can make it easier for students to conduct more qualified scientific studies, gain scientific process skills, and use them in their lives.

It has been emphasized that mainly analytical, creative, and practical thinking skills should be taught to students in schools (Sternberg, 2006). Students who can think analytically are more competent in criticizing, comparing, and evaluating the data they have obtained. Developing analytical thinking skills can facilitate students to be more creative. Individuals with analytical thinking skills have some common characteristics. These features are listed as follows (Amer, 2005):

- When dealing with the problems they face, they act on facts and logic rather than emotions,
- They are more likely to be successful in the problems they are interested in than other individuals,
- They tend to work focused on production,
- They may show different tendencies according to the problem-solving approach, and they are open to change,
- They focus more on data and ideas,
- They like to be organized,
- They are aware of their abilities, and their metacognitive skills are developed,
- They can manage to keep their emotions in the background,
- They can be cautious in bilateral relations.

Analytical thinking skill is one of the higher order thinking skills. Analytical thinking skill is the ability to divide a specific situation into smaller parts and to understand the relationships between these parts (Amer, 2005). Analytical thinking is closely related to critical and creative thinking. The development of this skill can

facilitate students to produce new and original ideas. Students question ideas, present evidence, question the arguments that form the basic structure of ideas, and establish relationships between arguments depending on their analytical thinking. In this context, it can be said that analytical thinking is necessary for critical thinking.

Today, individuals need to be able to think argumentatively, reasonably, creatively, and independently in order to keep up with changing living conditions (Lin, 2021; Ling & Ling, 2021; Noroozi et al., 2012; 2016; 2018; Yitmen, & Almusaed, 2022). In order to be able to think independently, it is necessary to be able to classify and define different perspectives and to be able to recognize the relationships that exist between them. Students can provide these abilities with analytical thinking skills. An individual who can think analytically can internalize the knowledge and skills he has learned and apply them in real life (Chonkaew et al., 2016). One of the aims of education is to enable individuals to find solutions to daily problems by using the information they have learned. The mental formation process required for solving the problem is closely related to analytical thinking skill. As the analytical thinking skill increases, the mental formation process also increases.

Purpose of the Research

Analytical thinking is one of the individuals' most important skills that the production and service sector demands (Schwab & Samans, 2016). In this respect, one of the primary purposes of education is to provide students with analytical thinking skills. Determining the factors related to analytical thinking skills can provide a more qualified preparation for the education process. In addition, determining the general trends of the research on the subject can guide the studies to be done later. This way, more qualified studies that meet the need for analytical thinking skills can be carried out. This research is aimed to examine graduate studies on analytical thinking in Türkiye. Accordingly, answers to the following research questions were sought.

1- What is the distribution of postgraduate studies on analytical thinking skills by years in Türkiye?
2- What is the distribution of postgraduate studies on analytical thinking skills in Türkiye according to the publication language?
3- What is the distribution of postgraduate studies on analytical thinking skills in Türkiye according to the study group?
4- What is the distribution of postgraduate studies on analytical thinking skills in Türkiye according to the type of study?
5- How is the distribution of postgraduate studies on analytical thinking skills in Türkiye according to the related subjects?
6- What is the distribution of postgraduate studies on analytical thinking skills in Türkiye according to the research method used?
7- How is the distribution of postgraduate studies on analytical thinking skills in Türkiye according to the measurement tools used?
8- What is the distribution of postgraduate studies on analytical thinking skills in Türkiye according to the analysis techniques used?

Method

The descriptive content analysis method was used in the research. This method is expressed as "describing the studies on a particular subject and evaluating the trends and research results in a descriptive dimension" (Çalık & Sözbilir, 2014). Using the descriptive content analysis method, postgraduate studies on analytical thinking skills were examined and arranged, and general trends in the field were determined. The YÖK national database was searched using the keyword "analytical thinking." Eight studies using the word analytical thinking in their titles were included in the research.

Results

This section gives descriptive information about graduate studies on analytical thinking skills. Studies on the subject were examined according to the year, publication language, study group, type of study, subject associated with analytical thinking skills, research method, measurement tool, and quantitative analysis techniques.

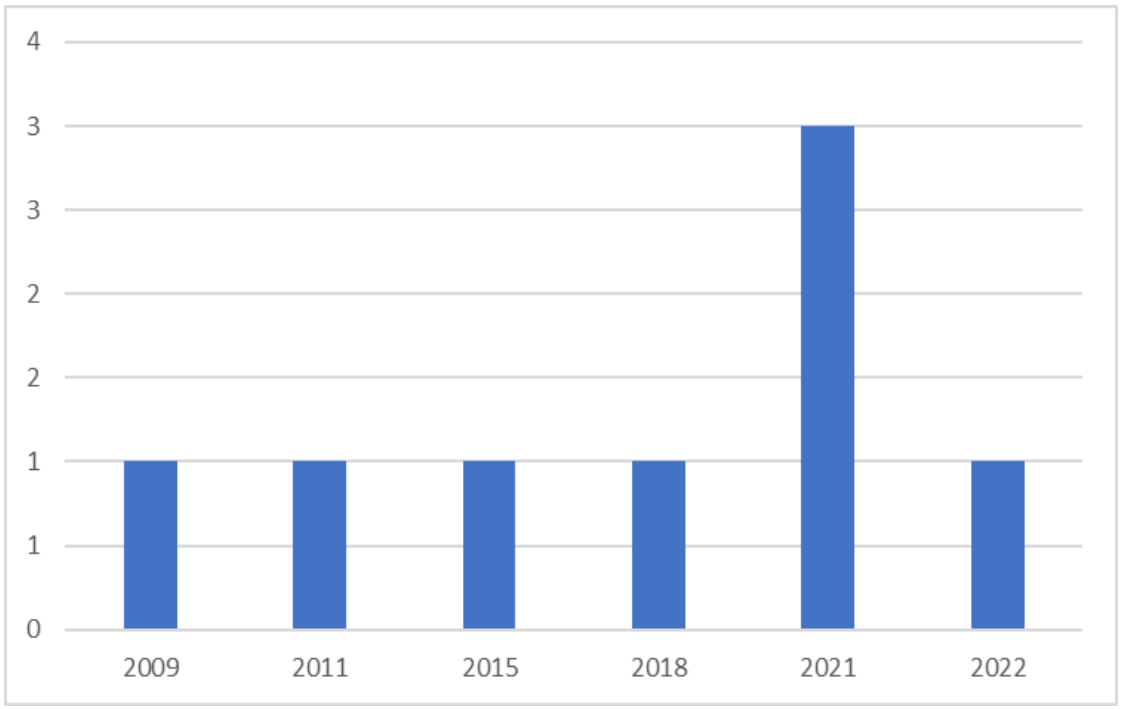

Figure 1. Distribution of Studies by Years

When Figure 1 is examined, it is understood that postgraduate research on analytical thinking skills started in 2009. Most works were completed in 2021. It has been observed that a limited number of studies have been conducted on the subject over time.

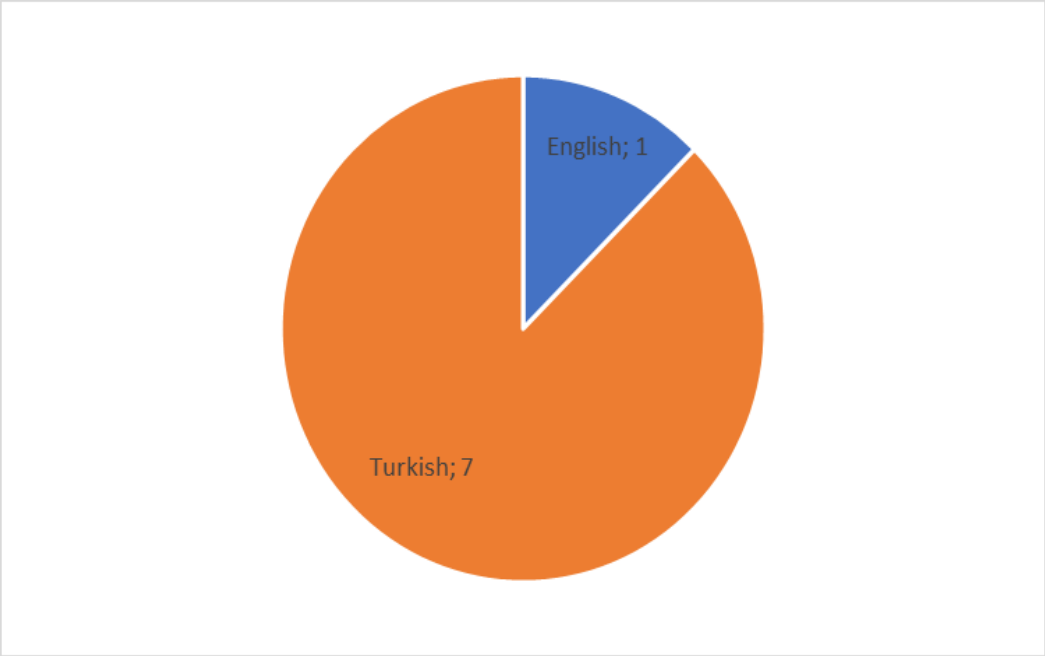

Figure 2. Distribution of Studies by Publication Language

When Figure 2 is examined, it is understood that a large proportion (87.5%) of postgraduate studies on analytical thinking were published in Turkish. There is only one study published in English.

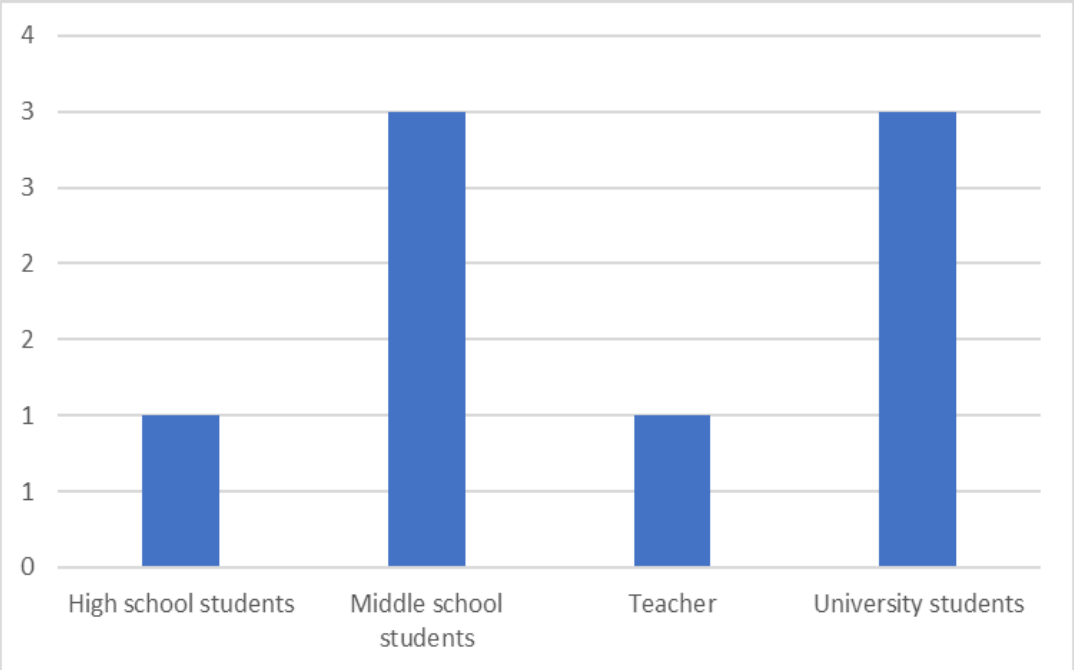

Figure 3. Distribution of Studies by Study Group

When Figure 3 is examined, it is understood that postgraduate studies on analytical thinking skills are mainly carried out with secondary school and university students. There are studies conducted with high school students and teachers. There are no studies conducted with pre-school and primary school students.

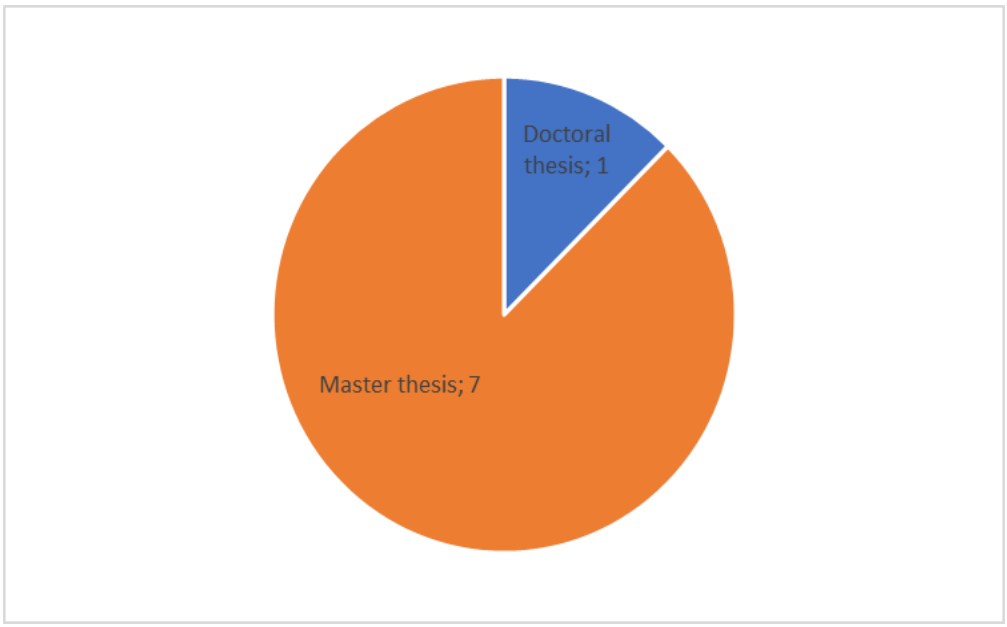

Figure 4. Distribution of Studies by Study Type

When Figure 4 is examined, it is understood that most postgraduate studies on analytical thinking (87.5%) are at the postgraduate level. There is only one study at the doctoral level on analytical thinking skills.

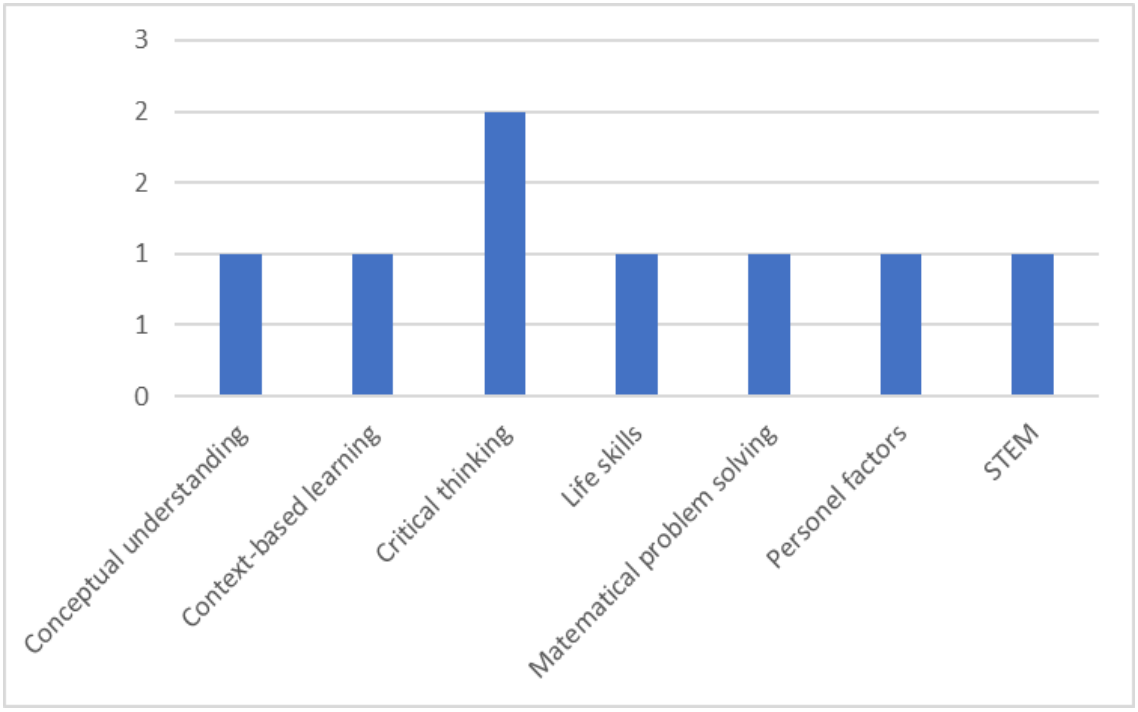

Figure 5. Distribution of Analytical Thinking Skills by Related Subjects

When Figure 5 is examined, it is understood that analytical thinking skills are associated with Conceptual understanding, Context-based learning, Critical thinking, Life skills, Mathematical problem solving, Personnel factors, and STEM subjects.

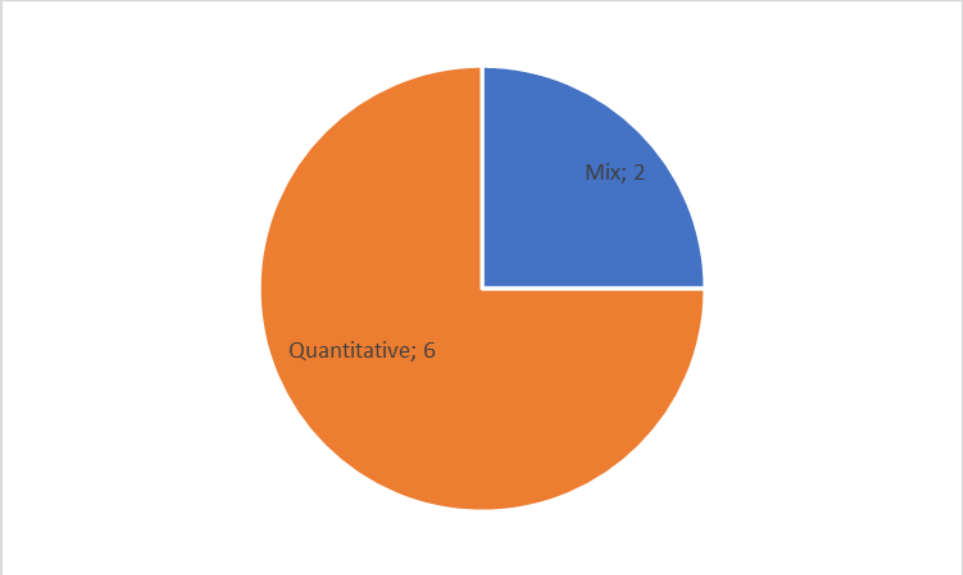

Figure 6. Distribution of Studies by Research Method

Figure 6 When examined, it is understood that a large proportion of the studies (75%) are in the type of quantitative research. No study is only in the type of qualitative research. The number of studies conducted using the mixed method is 2.

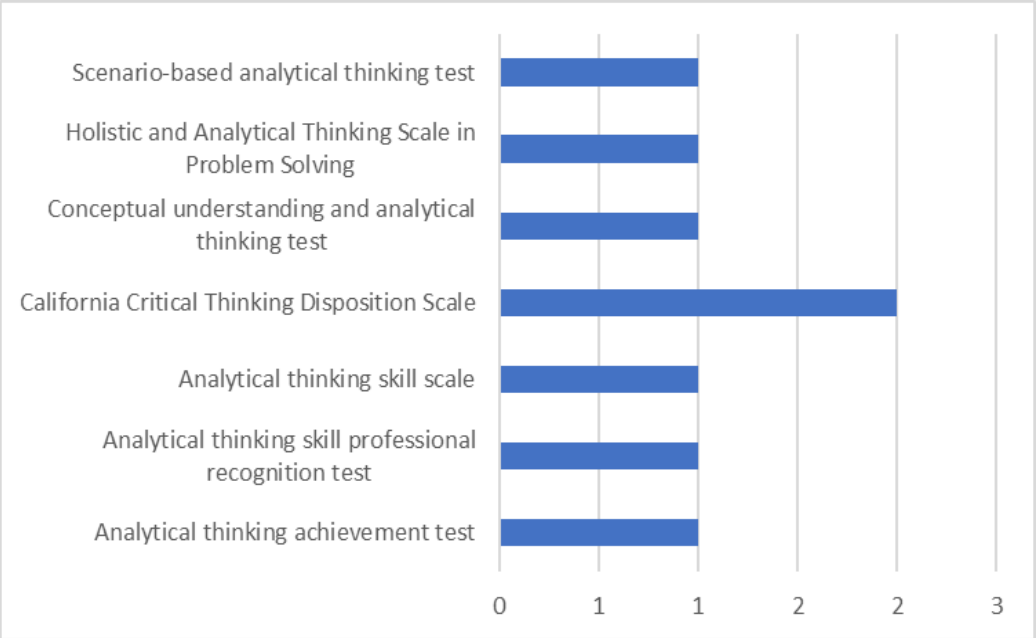

Figure 7. Distribution of Measurement Tools Used

Analytical thinking achievement test, Analytical thinking skill professional recognition test, Analytical thinking skill scale, California Critical Thinking Disposition Scale, Conceptual understanding and analytical thinking test, Holistic and Analytical Thinking Scale in postgraduate level research on analytical thinking skills. It is not understood that the Problem Solving and Scenario-based analytical thinking tests are used as measurement tools.

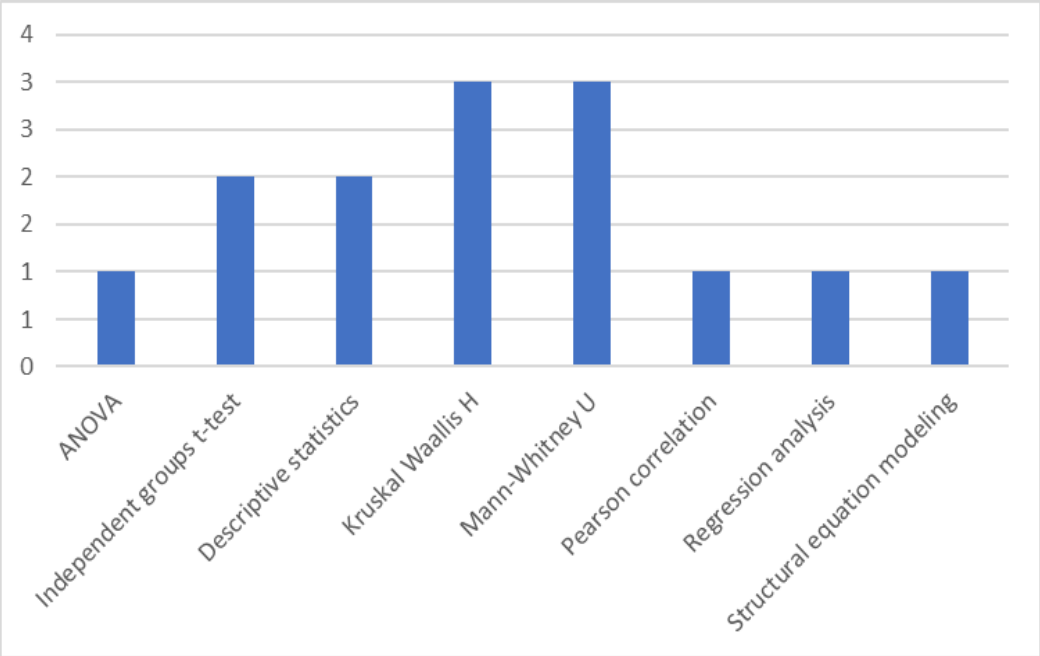

Figure 8. Distribution of Quantitative Analysis Techniques Used in Studies

When Figure 8 is examined, it is understood that analysis techniques such as ANOVA, Independent groups t-test, Descriptive statistics, Kruskal Wallis H, Mann-Whitney U, Pearson correlation, Regression analysis, and Structural equation model are used in studies related to analytical thinking skills. It has been observed that the number of advanced analysis techniques used is less.

Conclusion and Recommendations

In this study, postgraduate studies on analytical thinking in Türkiye were examined. In this way, the general trend of studies on analytical thinking skills has been revealed. According to the results obtained, it was determined that postgraduate research on analytical thinking skills started in 2009. Studies on the subject intensified in 2021. Analytical thinking is associated with higher-order thinking skills. Analytical thinking skill facilitates critical and creative thinking skills. Although analytical thinking skills are essential for individuals, it has been observed that a limited number of studies have been conducted on the subject.

According to the results obtained, it is understood that a large proportion (87.5%) of postgraduate studies on analytical thinking were published in Turkish. There is only one study published in English. It is understood that the studies carried out were mainly carried out with secondary school and university students. There are studies

conducted with high school students and teachers. There are no studies conducted with pre-school and primary school students.

Another conclusion reached in this study is that a large proportion of postgraduate studies (87.5%) on analytical thinking are at the postgraduate level. There is only one doctorate-level study on analytical thinking skills. In the studies carried out, analytical thinking skills have been addressed by associating them with subjects such as Conceptual understanding, Context-based learning, Critical thinking, Life skills, Mathematical problem solving, Personnel factors, and STEM. Studies need to investigate the relationship between analytical thinking skills and higher-order thinking skills such as creative thinking, reasoning, and practical thinking.

It was understood that the majority of the studies (75%) examined were in the type of quantitative research. No study is only in the type of qualitative research. The number of studies conducted using the mixed method is 2. In particular, there is a need for studies using qualitative research design. These studies can provide the opportunity to obtain deeper information from different sources on the subject.

Analytical thinking achievement test, Analytical thinking skill professional recognition test, Analytical thinking skill scale, California Critical Thinking Disposition Scale, Conceptual understanding and analytical thinking test, Holistic and Analytical Thinking Scale in Problem Solving and Scenario in postgraduate level research on analytical thinking skills It is not understood that the -based analytical thinking test is used as a measurement tool. It has been determined that these tools are mainly aimed at university students. Developing measurement tools that measure analytical thinking skills for different age groups may be recommended. It is understood that analysis techniques such as ANOVA, Independent groups t-test, Descriptive statistics, Kruskal Wallis H, Mann-Whitney U, Pearson correlation, Regression analysis, and Structural equation model are used in studies related to analytical thinking skills. It has been observed that the number of advanced analysis techniques used is less.

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