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THE USE OF THE SOCRATIC METHOD IN VISUAL PERCEPTION TRAINING AND ITS EFFECTS ON PRIMARY SCHOOL STUDENTS' DRAWINGS*

Şevval Nur Şen, İnönü University, Malatya, Türkiye

Meliha Yılmaz, Gazi University, Ankara, Türkiye

Corresponding Author: *Şevval Nur Şen, sevvalnurozkes@gmail.com*

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Abstract

Drawing, one of the most fundamental ways children express themselves, varies with age. Students in the study group, who are developmentally in the concrete operational stage, occasionally use templates in their drawings. In this context, the Socratic method, aimed at activating cognitive processes through guided questioning rather than presenting direct answers, emerges as a prominent approach, holding significant potential for the development of visual perception. This study aims to examine the effect of the Socratic method used in visual perception training on the self-portrait drawings of fourth-grade primary school students. The study employed one-group pretest–posttest weak experimental design, one of the quantitative research methods. The study group consisted of 55 fourth-grade primary school students. The data were obtained by evaluating the students' self-portraits drawn before and after the implementation of the Socratic method, using the Self-Portrait Evaluation Rubric. Inter-rater reliability had been established for the data, and a paired-samples t-test was used for the analysis. The study found that visual arts education supported by the Socratic method significantly improved students' observation-based drawing skills, enabling them to move away from template-based expressions across the sub-dimensions of form, expression, representation, proportion, composition, and detail. As a result, it was concluded that the Socratic method enhances visual perception in art education and is a recommended tool for fostering effective cognitive development.

Keywords: Visual Perception, Socratic Method, Self-Portrait, Art Education, Primary School

Highlights

- Socratic questioning enhanced visual perception in primary art education.
- Students' self-portraits shifted toward observation-based representation.
- Large effects were found across all drawing rubric dimensions.

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1. Introduction(First Level Subheading)

For children, drawing is an important part of the processes of self-recognition, self-expression, and making sense of their environment. During primary school, children who attempt to express their observations through drawing often depict stereotyped images ingrained in their minds. For instance, objects such as trees or birds are typically represented using similar templates despite their diversity. This indicates that although children look at objects, they cannot perceive them in detail. The distinction between looking and seeing is crucial to the drawing process. Visual perception is the process by which individuals receive visual stimuli from the outside world via their sensory organs, organize them through mental processes, and make sense of them. This process is a multifaceted operation encompassing cognitive, affective, and experiential dimensions beyond physical visual activity (Goldstein, 2010). Sekuler and Blake (2002) define visual perception as the recognition and interpretation of objects and relationships in the environment through their mental representation, emphasizing that the process is shaped by the individual's level of attention, past experiences, and cultural identity. In this context, perception is a subjective, contextual construct rather than a mechanical recording process. From the perspective of art education, visual perception is the starting point of the creative process. Arnheim (1974) argues that visual perception is more than a mechanical process; it is a way of thinking, thus establishing the principle that "seeing is thinking."

One of the most effective ways to help children move beyond the use of templates and break away from stereotypical drawings is to develop their visual perception. The difference between looking and seeing relates to visual perception. For example, although children know that fish exist in many different forms, when asked to draw a "fish," they tend to represent it with an almond-shaped template; similarly, although they are aware of the diversity of trees, they often depict a "tree" as a vertical rectangle topped with a circular form, or draw birds in an "M" shape despite their variety. These examples demonstrate that visual perception has not fully developed. In other words, children look at elements in their environment but fail to perceive their distinctive features. Therefore, the goal should not merely be to ensure that they look, but to ensure that they truly see, that is, perceive visually. At this point, the importance of visual perception training becomes evident. Visual perception training is a systematic and developmentally grounded learning process that aims to improve individuals' abilities to recognize, differentiate, organize, and interpret visual stimuli in their environment (Ateş & Yılmaz, 2024). The goal of this process is not only to notice visual elements but also to mentally organize them, structure them relationally, and form them into meaningful wholes. Rather than merely listening to theoretical explanations of concepts such as shape, direction, colour, and texture, students achieve longer-lasting learning by experiencing, comparing, and discovering these concepts through their own observations. In this context, open-ended tasks, design activities based on creative problem-solving, inquiry-based practices, and reflective discussions can support visual perception skills across multiple dimensions. During the process of visual perception training, the teacher's role should not be directive, but rather that of a facilitator who creates an environment for exploration (Ateş & Yılmaz, 2024).

Perception begins with attention; attention is a prerequisite for perception to occur. When students are asked to perceive the visual characteristics of a figure, an object, or any element, they may, if left on their own, overlook many aspects that do not immediately attract their attention. This situation necessitates cognitive intervention. Therefore, the role of an art educator in visual perception training is to draw, through appropriately structured questions, students' attention to all visual features of the element to be perceived .

At this point, the Socratic method also holding strong potential for the development of visual perception aims to activate individuals' cognitive processes through guiding questions rather than providing direct answers (Whiteley, 2006). The pedagogical function of the Socratic method relies on uncovering knowledge through a systematic

process of inquiry rather than on the direct transmission of information. As detailed in Plato's dialogues(Knox, 1998),Socrates, in this process, assumes the role of student, placing the other person in the position of teacher, and uses a technique of refutation called elenchus. This technique helps the interlocutor overcome their prejudices and reach a solid foundation of knowledge by leading them to contradict their own thoughts(Schiller, 2014). Based on the premise that visual perception is an act of meaning-making (Arnheim, 1974), the Socratic method enables students to move from passive looking to an active and inquiry-based mode of seeing by posing thought-provoking questions (Paraskevas & Wickens, 2003). In educational contexts, the Socratic method(also referred to as Socratic discussion, questioning, dialogue, or elenchus)is a pedagogical approach that emphasizes students' active participation in reflective and critical thinking processes (Whiteley, 2006). This method seeks to stimulate students' cognitive processes through systematic and investigative questioning, reveal the logical dimensions of the concepts under consideration, and deepen understanding through inquiry (Paraskevas & Wickens, 2003). The Socratic method adopts a student-centered structure, in which students are guided through questions, actively participate in discussions, and are provided with opportunities to freely express their own ideas (Kanat & Temel, 2019).

The implementation stages of the Socratic method reveal a structure in which the elements of thought (purpose, information, inference, concept, assumption, implication, point of view, focus, and context) are integrated with intellectual standards(clarity, accuracy, precision, relevance, depth, breadth, logic, and fairness)(Paul & Elder, 2006).These stages not only enable students to access knowledge but also encourage them to question it, consider alternative interpretations, and become aware of the implications of their thinking. In this way, the Socratic method makes significant contributions to the development of critical thinking, problem-solving, reflective learning, and a culture of democratic discussion (Shahsavar et al., 2013).

A review of the literature on the use of the Socratic method reveals that it supports students' cognitive processes and academic achievement across a wide range of disciplines, from science to language education (Aktaş & Karamustafaoğlu, 2021; Balbay, 2019; Bahtiyar & Can, 2021; Bülbül Hüner, 2020; Kanat & Temel, 2019; Jensen, 2015; Yang ve diğerleri, 2005; Yıldız & Dadı, 2019; Zeybek, 2019). When this transformative effect of the method is examined within the context of art education, research is seen to focus on aesthetic perception, design analysis, and visual literacy (Matthiessen, 2011; Miller, 2015; Hamblen, 1984; Hadassa, 2015). However, an examination of the existing literature in the visual arts reveals that the vast majority of studies focus on theoretical and verbal processes such as art criticism, aesthetic appreciation, or design analysis. Research examining the direct impact of Socratic questioning on applied drawing skills, particularly self-portrait performance, which requires a high level of attention to detail, including perceiving and depicting one's own face, is quite limited. Therefore, applied studies that support the cognitive dimension of the act of drawing using Socratic questioning are needed.

The Socratic method, which has not been used in the literature to improve visual perception, was designed within the context of this research to improve visual perception and to address that need.

As proposed by Lowenfeld and Brittain (1964), drawing ability is shaped by fundamental mechanisms such as motor skills involving the control of lines, cognitive functions that transform perception into action, and motivation (Saito et al., 2014). In particular, the effort to add detail, which begins in the schematic stage, gives way to more realistic, observation-based representations in the preadolescent stage, known as the 'dawning of realism.' Drawings that are initially self-centered gradually expand to include environmental and social elements (Dyson, 1997). In drawing-based activities such as self-portraiture, where individuals confront their own physical reality, students are required not only to look at their reflection in the mirror but also to see it through thoughtful perception (Arnheim, 1974). In this developmental process, practices such as self-portrait drawing emerge as

powerful modes of expression, revealing how individuals perceive themselves and which aspects of the self they consider significant.

Considering that students are in a transitional developmental stage from memorized drawing to realistic observation, this study aims to determine whether the Socratic method affects students' self-portrait drawings by enhancing their ability to perceive details and increasing their cognitive awareness of self-portrait elements.

In line with this general aim, the following sub-objectives were determined:

To examine whether visual perception training implemented through the Socratic method produces a significant difference between the pre-application and post-application self-portrait drawings of fourth-grade primary school students in terms of the following sub-dimensions:

1. Form
2. Expression
3. Proportion
4. Representation
5. Composition
6. To determine whether there is a significant difference in terms of the sub-dimensions of detail.

2. Method

2.1. Research Design

The study employed a quantitative research method, specifically weak single-group pre-test-post-test experimental design. In this design, the effect of the experimental treatment is tested on a single group, and the subjects' measurements of the dependent variable are obtained as a pre-test before the treatment and a post-test afterward, using the same subjects and the same measurement tools (Büyüköztürk et al., 2018). In this research, this design was chosen to focus on the effect of the Socratic method on intra-individual change and on its applicability. The potential for boredom and pedagogical limitations in children, especially those in developmental stages, resulting from repeating similar drawing tasks at short intervals without any cognitive intervention (control group), was taken into consideration. Accordingly, it was determined that a single-group design, rather than an intergroup comparison, was more suitable to the nature of the research, as it aimed to reveal the difference between students' initial perceptions and their performance at the end of the process.

2.2. Population and Sample

The study population consists of 4th-grade primary school students who attend state schools in the city center of Malatya during the 2025-2026 academic year. The purposive sampling method, a non-probability approach, was chosen to determine the study sample. Purposive sampling allows for the selection of cases that meet specific criteria in order to obtain in-depth information in line with the research objectives (Büyüköztürk et al., 2018). In this context, the criterion sampling strategy was used to determine the sample. Developmental appropriateness, lack of self-portrait training, and voluntariness were the main criteria used to form the sample group. The main reason for choosing the 4th-grade level is that this age group (10-11 years old) is in Piaget's concrete operational stage of cognitive development. Children in this stage move away from egocentric thinking, begin to grasp objective reality, and show significant maturation in fine motor skills(Piaget, 2017).Therefore, this age group is one of the critical stages for transferring to drawing the skills aimed at changing the way of seeing and noticing details, which are

targeted by the Socratic method. To ensure internal validity, students were required not to have previously received academic-level training in self-portrait painting and not to have experienced a course employing the Socratic method. The suitability of the school's physical facilities (workshop and related spaces) for the study, the students' voluntary participation, and parental consent were also considered essential. Based on the established criteria, 55 students (30 female, 25 male) were included in the study. Due to the nature of the Socratic method and the risk of reduced interaction in large groups, the 55 students were divided into groups of up to 12 across 5 sessions. This ensured the active participation of each student in the discussions.

2.3. Data Collection Instruments

The process of measurement and evaluation in visual perception training requires a multidimensional structure, and performance-based assessment tools hold an important place in this field (Gökdemir & Yılmaz, 2023). Accordingly, the "Self-Portrait Evaluation Rubric," developed by the researchers, was used as the data-collection instrument in this study. The Self-Portrait Evaluation Rubric was developed using a systematic approach. In the initial stage, the relevant literature was reviewed, and the key dimensions to be evaluated in self-portrait drawings were identified. Based on the understanding that different criteria can be added or removed depending on the purpose of the study (Yılmaz & İnceağaç, 2017), and drawing on the literature on visual arts education, children's drawings, and visual perception, the sub-dimensions were established. Following this stage, expert opinions from faculty members specializing in Art Education and Measurement and Evaluation were obtained on the draft form, thereby ensuring content validity. The developed rubric consists of six sub-dimensions: "Form," "Expression," "Proportion," "Representation," "Composition," and "Detail." Each dimension was scored on a scale ranging from 1 (Poor) to 5 (Very Good).

2.4. Data Collection Process

Implementation of the study followed a highly structured procedure that controlled external variables. To ensure the reliability and validity of the data, equal conditions were provided to all participants, and implementation took place in the visual arts classroom of a public school. Due to the nature of the Socratic method and the risk of reduced interaction in large groups, the 55 students were divided into groups of ten and participated in six sessions in total. In this way, active participation by each student in the discussions was ensured. The data collection process was conducted in sequential stages: pre-application, break, Socratic discussion, and post-application. The details of the implementation process are presented below.

Planning of the Sessions: To prevent intergroup information sharing, which could threaten study validity, a specific session plan was developed. The arrival and departure times, as well as break periods, were arranged so that the groups would not encounter or communicate with one another. Thus, the possibility that a student from an earlier group could inform a subsequent group about the content was eliminated, ensuring that each group began implementation with the same level of information and without bias.

Preparation: Prior to implementation, the materials were standardized to a certain level to prevent potential errors arising from the data collection instruments. In this context, all students were provided with standard-sized (A4) drawing paper, colored pencils of the same brand and quality, and individual hand mirrors to enable detailed observation of their facial features.

Pre-Application (First Self-Portrait Drawings): During the first stage of implementation, students were provided with a brief definition of the concept of 'self-portrait'. They were asked, while looking into a mirror, to draw themselves from the chest upward (in bust form). No interventions were made to the students' drawings

throughout the process. After the completion of the initial drawings, the pre-application phase (approximately 40 minutes), the papers were collected, and the students were given a short break in a controlled environment to avoid contact with other groups.

Experimental Process (Socratic method): Following the break, the group participated in a Socratic-method session that constituted the study's independent variable. During this approximately 20-minute session, the researchers posed and discussed Socratic questions with the students. Some of the Socratic questions developed by the researchers are presented below:

- ...
- Where is the parting of your hair? If we draw a line from top to bottom, where would that parting be?
- ...
- What is the distance between your eyebrows?
- ...
- What is the length of your nose? Is it long or short? Let's examine the distance from your eyebrows to your lips.
- ...

Discussions were standardized across all six sessions, using the same questions and prompts.

Post-Application (Second Self-Portrait Drawings): Immediately following the discussion session, the post-application phase was initiated to observe how students expressed their visual perceptions through their drawings. Standard paper and pencils were redistributed to the students, and they were asked to draw their second self-portrait using mirrors for approximately 40 minutes.

2.5. Data Analysis

The most critical stage in the data analysis involved converting students' drawings into objective scores. During the evaluation of each student's self-portrait drawing, both the researcher and the expert rater used each student's portrait photograph as a reference. In this process, in which the drawing and the photograph were examined side by side, the student's ability to represent facial features, proportions, and physical characteristics served as the basis. This approach minimized rater subjectivity, particularly in the evaluation of rubric sub-dimensions, and enhanced the construct validity of the measurement. To ensure transparency in the evaluation process and to illustrate how the photograph–drawing comparison was conducted, Figure 1 presents a visual example from a randomly selected student.



Figure 1.

An example based on the comparison of photograph and drawing

In the first stage of data analysis, analyses of inter-rater agreement (ICC and Cohen's Kappa) and intra-rater consistency (Cronbach's Alpha) were conducted to assess the consistency and reliability of the dataset. The high reliability coefficients obtained indicated that the data were suitable for statistical analysis. To determine whether the scores obtained from the rubric met the assumptions of parametric tests, a normality test was performed. Given the sample size (N = 55), skewness and kurtosis coefficients were used to assess normality. The analysis revealed that the skewness and kurtosis values of both pre-test and post-test scores fell within the range of -1.5 to +1.5. According to Tabachnick and Fidell (2007), this range is sufficient to assume a normal distribution of the data. Because the data exhibited a normal distribution, the Paired Samples t-test, a parametric test, was used to determine the effect of the Socratic method on students' self-portrait drawing skills. This test was preferred to examine whether there was a statistically significant difference between the mean scores of the same group before (pre-test) and after (post-test) the implementation (Büyüköztürk et al., 2018).

2.6. Validity and Reliability

To ensure the validity and reliability of the study, inter-rater reliability was first examined as part of assessing data reliability. To determine the level of agreement among three experts' evaluations, Cohen's kappa (κ) and the intraclass correlation coefficient (ICC) were calculated.

Table 1.

Inter-Rater Reliability Analysis(Cohen's Kappa and ICC Results)

Sub-dimension evaluated	**U1 - U2 Compatibility**	**U1 - U3 Compatibility**	**U2 - U3 Compatibility**	**Correlation Coefficient (ICC)**
	κ (p)	**κ (p)**	**κ (p)**	**ICC (p)**
Form	0,676 (p<.001)	0,882 (p<.001)	0,736 (p<.001)	0,967 (<.001)
Expression	0,717 (p<.001)	0,658 (p<.001)	0,603 (p<.001)	0,951 (<.001)
Proportion	0,632 (p<.001)	0,815 (p<.001)	0,759 (p<.001)	0,955 (<.001)
Representation	0,772 (p<.001)	0,657 (p<.001)	0,688 (p<.001)	0,971 (<.001)
Composition	0,687 (p<.001)	0,825 (p<.001)	0,743 (p<.001)	0,968 (<.001)
Detail	0,622 (p<.001)	0,592 (p<.001)	0,672 (p<.001)	0,951 (<.001)

The Cohen's Kappa and Intraclass Correlation Coefficient (ICC) results presented in Table 1 indicate high, statistically significant agreement among raters. According to the classification proposed by Landis and Koch(1977),the Kappa values suggest that the level of agreement ranges from 'moderate' to 'almost perfect.' In particular, in the U1–U3 pairing, sub-dimensions such as 'Form'(κ = 0.882)and 'Composition'(κ = 0.825) demonstrate an 'almost perfect' level of agreement. The lowest agreement value was obtained in the 'Detail' sub-dimension between U1 and U3(κ = 0.592). Although this value lies at the boundary of 'moderate agreement,' it still indicates an acceptable level of consistency. The significance of all Kappa coefficients at the $p < .001$ level further confirms strong inter-rater agreement.

The ICC values reflecting the overall consistency among the three raters ranged between 0.951 and 0.971, indicating an excellent level of agreement across all sub-dimensions. According to the criteria proposed by Koo and Li (2016), ICC values of 0.90 and above are considered indicative of excellent reliability; therefore, the fact that all values obtained in this study exceed 0.95 demonstrates that the ratings are highly consistent and reliable. When Cohen's Kappa and ICC values are considered together, the rubric was applied largely consistently by different experts.

Intra-rater reliability of the data was calculated using Cronbach's alpha coefficient. Intra-rater reliability is determined by examining the consistency of scores assigned by the same individual. In most studies, it is estimated using the Cronbach's alpha coefficient (Jonsson & Svingby, 2007). Analyses of the pre-test evaluations revealed alpha values of .923, .932, and .947 for the first, second, and third experts, respectively, and an overall agreement score of .943. For the post-test evaluations, the alpha values were .878, .882, and .894 for the first, second, and third experts, respectively, with an overall agreement score of .900. Cronbach's alpha is a reliability coefficient ranging between 0 and 1, with values closer to 1 indicating higher internal consistency. Generally, values of 0.70 or above are considered to reflect high internal consistency (Jonsson & Svingby, 2007). These results indicate that all three raters demonstrated a high level of consistency in the scoring process. Prior to analyzing the pre-test and post-test rubric scores, the normality of the data was assessed. Based on the skewness and kurtosis values (within the range of ±1.5), the data were found to be normally distributed; therefore, a paired samples t-test was applied (Tabachnick & Fidell, 2007).

3. Results

Table 2.

Paired Samples t-Test Results for the Comparison of Pre-Test and Post-Test Scores Based on the Mean of Three Raters

Dimensions	Score	N	M	ss	sd	t	p	Cohen's d
Form	Pre-test	55	2.46	1.09	54	-11.60	<.001	1.56
	Post Test	55	4.01	0.85				
Expression	Pre-test	55	2.69	1.17	54	-11.53	<.001	1.55
	Post Test	55	4.35	0.76				
Proportion	Pre-test	55	2.41	1.00	54	-11.63	<.001	1.57
	Post Test	55	3.78	0.79				
Representation	Pre-test	55	2.39	1.08	54	-10.76	<.001	1.45
	Post Test	55	4.15	0.95				
Composition	Pre-test	55	2.53	1.10	54	-10.60	<.001	1.43
	Post Test	55	3.86	0.90				
Detail	Pre-test	55	2.20	0.96	54	-13.81	<.001	1.86
	Post Test	55	4.08	0.89				
Total Score	Pre-test	55	14.68	5.65	54	-14.39	<.001	1.94
	Post Test	55	24.22	4.20				

Table 2 presents the results of the paired samples t-test comparing pre-test and post-test scores based on the mean ratings of three raters. The findings indicate statistically significant increases favoring the post-test across all sub-dimensions and in the total score ($p < .001$). When the pre-test and post-test mean scores presented in Table 2 are compared, a notable increase is observed across all sub-dimensions. The mean differences (Post-Test – Pre-Test) are as follows:

- Form: 4.01 – 2.46 = +1.55
- Expression: 4.35 – 2.69 = +1.66
- Proportion: 3.78 – 2.41 = +1.38
- Representation: 4.15 – 2.39 = +1.76
- Composition: 3.86 – 2.53 = +1.33
- Detail: 4.08 – 2.20 = +1.88
- Total Score: 24.22 – 14.68 = +9.54

According to these findings, the 'Detail' (+1.88) and 'Representation' (+1.76) sub-dimensions had the highest mean increases, followed by 'Expression' (+1.66) and 'Form' (+1.55). Although relatively smaller increases were observed in 'Composition' (+1.33) and 'Proportion' (+1.38), the post-test means in these dimensions remained significantly higher than pre-test means, indicating improvements that are both statistically significant and pedagogically meaningful. The overall increase of 9.54 points in the total score demonstrates that the implementation led to a strong and holistic improvement in students' visual expression performance.

When effect sizes were evaluated using Cohen's d, large effects were observed for Form (d = 1.56), Expression (d = 1.55), Proportion (d = 1.57), Representation (d = 1.45), Composition (d = 1.43), Detail (d = 1.86), and the total score (d = 1.94). These values are considered indicative of a large effect (Pallant, 2016), and all Cohen's d values obtained in this study are well above this threshold. Therefore, the findings suggest that the observed differences between pre-test and post-test scores are statistically significant and educationally meaningful.

Examples of student work are presented below to support the results shown in the table.



Figure 2.

Examples of children's drawings

4. Discussion, Conclusion and Recommendations

This study aimed to examine the effect of the Socratic method on fourth-grade primary-school students' drawings. The findings revealed that visual arts activities based on the Socratic method led to a statistically significant improvement in students' observation-based drawing skills, enabling them to move away from schematic representations. This indicates that students also experienced a meaningful development in their visual perception processes.

The results demonstrate, in particular, that the improvement observed in the 'Form' dimension reflects a transformation in how students perceive object contours. The findings suggest that the Socratic method encouraged students to question previously internalized geometric schemas and guided them toward observation-based forms. The significant changes observed in the drawings indicate that students shifted from relying on geometric memorization to relying on anatomical observation (e.g., oval or egg forms, thinness, length). This finding supports Rudolf Arnheim's (1974) view that perception is a process of mental organization and demonstrates that well-structured questioning can reconstruct existing mental schemas.

A substantial improvement in the 'expression' dimension, which reflects emotion and character in students' drawings, is among the study's most noteworthy findings. Although the pre-application drawings were generally dominated by neutral or stereotypical happy facial expressions (e.g., a parenthesis-shaped mouth), after implementation of the Socratic method, students were able to reflect, as observed in the mirror, their momentary emotional states, including the positioning of the eyebrows and the curvature of the lips. The Socratic method enables knowledge to be transferred and reapplied across different contexts(Dalim et al., 2022)and encourages the exploration of multiple perspectives through critical inquiry(Muneer et al., 2021).In this regard, the findings suggest that the Socratic method directs individuals' attention from superficial appearances to deeper layers of meaning, and that expression-oriented questioning enables students to recognize and represent the emotional expressions reflected in their own faces.

The findings of the study indicate that the Socratic method was **a**lso **e**ffectiv**e in the** 'Prop**ortion' and** 'Composition' dimensions, although the magnitude of its effect was lower than in the other dimensions. In particular, in the stage of detailed drawing that emerges during the schematic phase, children tend to attend to representational elements such as proportion, line accuracy, colour, spatial organization, and awareness of detail (Lowenfeld & Brittain, 1964). In line with this, the findings suggest that students were able to establish more accurate relationships between objects and to organize visual elements more consciously. Since the Socratic method is a systematic questioning approach that fosters awareness of students' superficial knowledge (Yang et al., 2005), the superficial attempts observed in the pre-application phase gave way to themes requiring greater attention, such as proportion and composition. Furthermore, this finding demonstrates that visual perception involves not only representing isolated elements but also making sense of the relationships among them. For example, instead of focusing solely on individual features such as the nose or mouth, students began to attend to relational aspects, such as the distance between these features.

When evaluated holistically, the Socratic method appears effective across all sub-dimensions of the drawings; that is, across the works as a whole. This finding is consistent with previous studies in art education that emphasize the transformative impact of the Socratic method. For example, Hadassa (2015) found that students who received instruction through the Socratic method in visual arts classes demonstrated significantly higher academic and artistic performance compared to those taught through traditional methods. Similarly, Matthiessen (2011) reported that Socratic dialogue in graphic design education encourages students to move beyond superficial

aesthetic judgments and to question the underlying meaning of design, while Miller (2015) highlighted that this method enhances students' visual literacy and observational skills. These studies primarily focus on the influence of the Socratic method on cognitive processes, such as seeing, analysing, and making meaning. While the effect size obtained in the present study supports these perspectives, it also demonstrates that the method functions as a powerful cognitive intervention not only in verbal and theoretical processes such as art criticism or design analysis (Hamblen, 1984), but also at the level of visual perception and direct drawing performance. In this study, students first developed cognitive awareness through Socratic inquiry and subsequently translated this awareness into practical drawing skills. Ultimately, the Socratic questioning process, which enables students to overcome the cognitive threshold between looking and seeing, facilitates a holistic improvement in their drawing abilities by restructuring their visual perception.

5. Limitations

The study group consists of 55 fourth-grade students enrolled in primary schools in Malatya. This limits the generalizability of the findings to different age groups, socio-cultural contexts, and educational levels. The research was limited to a short-term implementation, and no follow-up (retention) measurements were conducted to assess the long-term persistence of the observed developments. Therefore, it is not possible to draw definitive conclusions regarding the continuity of the Socratic method's effects on visual perception. Finally, the evaluation in this study was based solely on self-portrait drawings. How visual perception may develop through different artistic activities or content areas was beyond the scope of this study.

6. Suggestions

Based on the results of this research, the Socratic method can be used in visual arts lessons as an effective teaching approach to support education in visual perception at the primary school level. In particular, students' movement away from conventional drawing styles toward observation-based, detailed, and more realistic representations indicates that directing students' attention to visual details through structured questions, rather than directly conveying information during instruction, is important. Therefore, it is recommended that visual arts teachers incorporate open-ended, non-directive Socratic questions into their lessons to help students recognize visual elements such as form, proportion, expression, composition, and detail. From a practical perspective, Socratic question-based visual perception activities can be developed for use in visual arts lessons. Sample question pools focusing on the dimensions of form, expression, proportion, representation, composition, and detail can be prepared for teachers and adapted to different artistic applications. In addition to self-portraits, the Socratic inquiry approach can be used for still-life drawing, human-figure drawing, animal drawing, spatial drawing, nature observation, three-dimensional works, and color-composition activities. Thus, the method's impact can be extended beyond self-portrait drawing to include different areas of visual expression through classroom applications. The effectiveness of the Socratic method can be compared with approaches such as traditional teaching, demonstration-based methods, structured-observation training, or art-criticism-based teaching. Furthermore, because retention was not measured after application in this study, subsequent studies can conduct follow-up tests at intervals of two weeks, one month, or longer to examine the extent to which students' visual perception and drawing skills have improved.

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REFERENCES

Aktaş, İ. ve Karamustafaoğlu, O. (2021). Teachers' Opinions about the Applicability of Science Activities Developed Based on Socratic Questioning Method. *Western Anatolia Journal of Educational Sciences*, 12(2),374-405.

Arnheim, R. (1974). *Art and visual perception: A psychology of the creative eye* (New version). University of California Press

Ateş, A., & Yılmaz, M. (2024). A Method Suggestion for Improving Visual Perception in Art Education. *The Journal of Turkish Educational Sciences*, 22(2), 1577-1600. https://doi.org/10.37217/tebd.1486038

Bahtiyar, A. ve Can, B. (2021). The Views of Science and Art Center (SAC) Students Regarding Socratic Inquiry Seminars. *Journal of Qualitative Research in Education*, 28, 1-21. doi: 10.14689/enad.28.1

Balbay, S. (2019). Enhancing critical awareness through Socratic pedagogy. *Eurasian Journal of Applied Linguistics*,5(3),515-536. Doi: 10.32601/ejal.651348

Bülbül Hüner, S. (2021). Effect of Socratic Questioning on Success and Attitude and the Compliance of the Thoughts Produced to Intellectual Standards. *Ankara University Journal of Faculty of Educational Sciences (JFES)*, 54(1), 35-68. https://doi.org/10.30964/auebfd.632214

Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2018). *Bilimsel Araştırma Yöntemleri* (24 b.). Ankara: Pegem Akademi.

Dalim, S. F., Ishak, A. S., & Hamzah, L. M. (2022). Promoting students' critical thinking through socratic method: Views and challenges. *Asian Journal of University Education (AJUE)*, *18*(4),1034-1047.

Dyson, A. H. (1997). *Writing superheroes: Contemporary childhood, popular culture, and classroom literacy.* Teachers College Press.

Goldstein, E. B. (2010). *Sensation and perception* (8th ed.). Wadsworth Cengage Learning

Gökdemir, M. A., & Yılmaz, M. (2023). Development Of A Grade Scorıng Key (Gsk) To Evaluate Three-Dımensıonal Studıes Made From Lıterature Products**.** *International Journal of Turkish Literature, Culture and Education.* 12(4),1807-1821. https://doi.org/10.7884/teke.1295981

Hadassa, A. A.(2015). *The effects of the Socratic method on students art performances in secondary schools in kaduna-Nigeria* (Doctoral dissertation).

Hamblen, K. A. (1984). The Application of Questioning Strategy Research to Art Criticism Instruction. https://files.eric.ed.gov/fulltext/ED243787.pdf

Jensen Jr, R. D. (2015). The Effectiveness of the Socratic Method in Developing Critical Thinking Skills in English Language Learners. *Online Submission*.

Jonsson, A., & Svingby, G. (2007). The use of scoring rubrics: Reliability, validity and educational consequences. *Educational Research Rewiew, 2*(2), 130-144. doi:https://doi.org/10.1016/j.edurev.2007.05.002

Kanat, K., & Temel, F. (2019). An Investıgatıon Of The Effect Of The Socratıc Method-Based Currıculum On 5-6 Year-Old Chıldren's Workıng Memorıes. *Türkiye Sosyal Araştırmalar Dergisi*, 23(3),892-905.

Koo, T. K., & Li, M. Y. (2016). A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *Journal of chiropractic medicine*, *15*(2), 155-163. https://doi.org/10.1016/j.jcm.2016.02.012

Landis JRKoch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, *33*(1),159174.

Lowenfeld, V., Brittain, W. L. (1964). *Creative and mental growth (Fourth Edition)*. The Macmillan Company.

Matthiessen, N. (2011). Socratic Dialogue in Design Education. In: Marcus, A. (eds) Design, User Experience, and Usability. *Theory, Methods, Tools and Practice. DUXU 2011. Lecture Notes in Computer Science*, vol 6769. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-21675-6_11

Miller, K.(2015). *Visual literacy and Socratic seminars in a secondary Montessori classroom* (Doctoral dissertation).

Muneer, S., Kayani, H. A., Ali, K., Asif, E., Zohra, R. R., & Kabir, F. (2021). Laboratory biosafety and biosecurity related education in Pakistan: Engaging students through the Socratic method of learning. *Journal of Biosafety*

and Biosecurity, *3*(1),22-27.

Paraskevas, A., & Wickens, E. (2003). Andragogy and the Socratic method: The adult learner perspective. *Journal of Hospitality, Leisure, Sport & Tourism Education (Oxford Brookes University)*, *2*(2).

Paul, R., & Elder, L. (2006). The thinker's guide to the art of Socratic questioning.California: The Foundation for Critical Thinking. https://ia802305.us.archive.org/5/items/the-art-of-socratic-questioning/The%20Art%20of%20Socratic%20Questioning.pdf

Piaget, J. (2017). *Çocukta karar verme ve akıl yürütme.* (S. E. Siyavuşgil, Çev.) Ankara: Palme Yayıncılık.

Saito, A., Hayashi, M., Takeshita, H., & Matsuzawa, T. (2014). The origin of representational drawing: a comparison of human children and chimpanzees. *Child development*, *85*(6), 2232-2246.

Schiller, N. (2014). Finding a Socratic method for information literacy instruction. In *Critical Thinking Within the Library Program* (pp. 38-55). Routledge.

Shahsavar, Z., Hoon, T. B., Thai, Y. N., & Samah, B. A. (2013). Promoting tertiary level students' critical thinking through the use of socratic questioning on the blog. *Pertanika Journal of Social Science & Human*, *21*(S),57-70.

Sekuler, R., & Blake, R.(2002). *Perception* (4th ed.). McGraw-Hill

Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics.* Boston: Perason Allyn and Bacon

Whiteley, T. R. (2006). Using the Socratic method and Bloom's taxonomy of the cognitive domain to enhance online discussion, critical thinking, and student learning. In *Developments in Business Simulation and Experiential Learning: Proceedings of the Annual ABSEL conference* (Vol. 33).

Yang, Y. T. C., Newby, T. J., & Bill, R. L. (2005). Using Socratic Questioning to Promote Critical Thinking Skills Through Asynchronous Discussion Forums in Distance Learning Environments. *American Journal of Distance Education*, *19*(3), 163–181. https://doi.org/10.1207/s15389286ajde1903_4

Yıldız, A., & Dadı, M. (2019). Teaching of the 'Avagadro Number' by Using the Method of Socrates Finding. *Iğdır University Journal of Social Sciences* (17),369-402.

Yılmaz, M., & İnceağaç, M. (2017). Development of a Guide Scoring Key (Rubric) in order to Identify the Effects of Literature Materials as part of the Visual Arts Education Practices. *Erzincan University Faculty of Education Journal19*(3),1-16. https://doi.org/10.17556/erziefd.341456

Zeybek, G. (2019). Instruction of "Ohm Law" with Socratic Questioning Method. *Journal of Educational Theory and Practice Research*, *5*(1),53-63.