

# Effect of Systems Thinking Approach on 2nd Grade Students' Reading Comprehension in Turkish Lessons

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The utilization of systems thinking (ST) in combination with system dynamics tools holds promise as an integrated approach for K-12 education. This study aimed to explore the impact of employing ST tools in Turkish lessons. A quasi-experimental design with non-equivalent groups was conducted, incorporating pre-tests, post-tests, and delayed post-tests to assess the effect on reading comprehension among 46 second-grade students. The initial assessment revealed comparable readiness levels between the control and experimental groups. However, the experimental group demonstrated significantly higher post-test mean scores, ranging from 21% to 46% ( $p < 0.05$ ). Interviews conducted six weeks later with randomly selected students from the experimental group showed no significant difference ( $p > 0.05$ ) between delayed post-test and post-test scores, indicating that ST-supported lessons enhance retention. These findings advocate for the introduction of ST concepts and tools early in education, enabling students to extract deeper meanings from texts, think multidimensionally, and foster a holistic perspective.

## Introduction

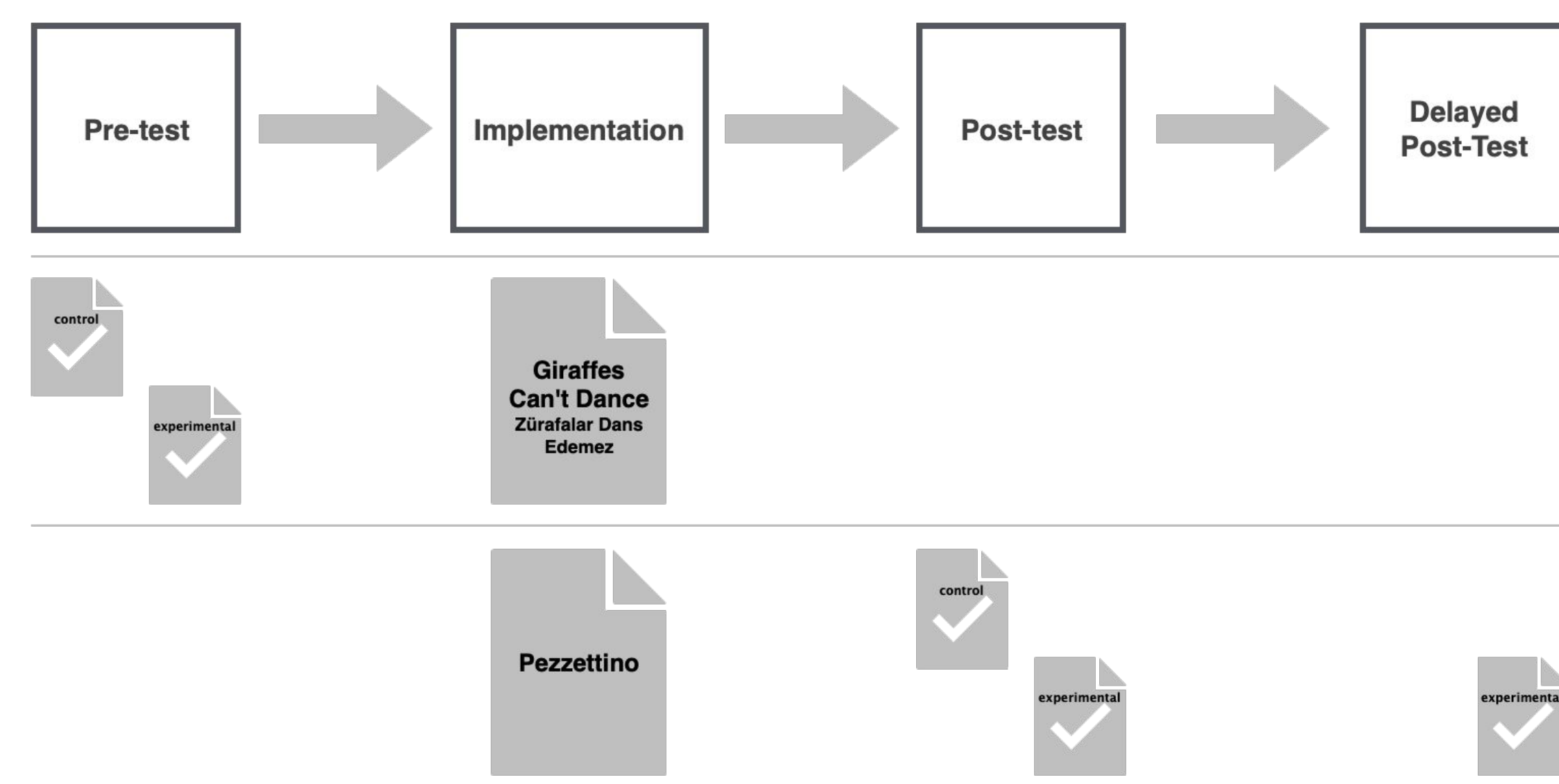
Reading comprehension is essential for self-expression, self-learning, and preserving cultural diversity, which are key skills in the 21st century education system. Various methods are used in schools to teach reading comprehension, including traditional approaches like word recognition and repetitive reading, as well as newer strategies that focus on pre-, during-, and post-reading reflection.

Among these strategies, the use of systems thinking tools has shown promise. Systems thinking provides a holistic perspective that helps students make connections and see the bigger picture.

This study aims to investigate the impact of systems thinking tools on the teaching of Turkish lessons to second-grade students, specifically examining whether using these tools with the storybook "Pezzettino" leads to improved reading comprehension compared to traditional methods.

Previous studies have demonstrated the effectiveness of systems thinking tools in enhancing students' system thinking abilities and academic achievements. However, limited research exists on the use of these tools for reading comprehension in primary school students, indicating a potential area for future exploration and the development of innovative teaching methods.

## Approach



A quasi-experimental design was employed that included an experimental group taught using systems thinking tools and a control group taught using traditional methods. The readiness levels of both groups were assessed through a pre-test using a different story.

The intervention involved using systems thinking tools with the experimental group, while the control group followed traditional reading methods. Post-tests were conducted to measure reading comprehension.

Six weeks later, a delayed post-test was administered to assess the long-term impact of the intervention. The assessment questions used rubrics and were based on established practices. The study involved 46 second-grade students from a private school, with the experimental and control groups consisting of 23 students each.

## Results & Conclusion

	Control Group		Experimental Group		Difference between groups			
	Point Score	Adjusted Weight	Point Score	Adjusted Weight	Difference	Diff. (%)	t-test	
<b>Pre-Test for readiness</b>								
Question 1	10.65	25	9.55	25	-1.11	-10%	0.626	
Question 2	8.48	25	10.91	25	2.43	29%	0.082	
Question 3	17.83	25	15.23	25	-2.60	-15%	0.283	
Question 4	13.91	25	11.36	25	-2.55	-18%	0.411	
<b>Post-Test</b>								
Question 1	11.52	20	5.76	8.41	<b>2.65</b>	<b>46%</b>	0.000	
Question 2	10.43	20	5.22	7.27	<b>2.06</b>	<b>39%</b>	0.001	
Question 3	12.61	20	6.30	9.09	<b>2.79</b>	<b>44%</b>	0.000	
Question 4	10.87	20	5.43	7.95	<b>2.52</b>	<b>46%</b>	0.000	
Question 5	6.52	10	6.52	9.32	<b>2.80</b>	<b>43%</b>	0.000	
Question 6	8.26	10	8.26	10.00	<b>1.74</b>	<b>21%</b>	0.000	
Question 7 (about SD tools)				19.09			20	
Question 8 (about SD tools)				10.00			10	
Question 9 (about SD tools)				10.00			10	
<b>Delayed Post-Test</b>								
Question 1				20	20	10.00	1.59 19%	0.154
Question 2				18	20	9.00	1.73 24%	0.176
Question 3				19	20	9.50	0.41 4%	0.662
Question 4				19	20	9.50	1.55 19%	0.196
Question 5				10	10	10.00	0.68 7%	0.401
Question 6				10	10	10.00	0.00 0%	-

The t-test analysis showed no statistically significant differences in readiness levels between the control and experimental groups before the intervention. However, after the intervention, the experimental group, which used systems thinking tools, outperformed the control group significantly. The post-test and delayed post-test results indicated that systems thinking tools facilitated deeper understanding and increased retention rates suggesting that incorporating systems thinking tools in reading and comprehension lessons can enhance students' analytical skills and interest in reading.