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RoboKind® Numeracy White Paper

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Quasi-Experimental Pre–Post T-Test Study on the Effectiveness of RoboKind® Numeracy in Strengthening Early Numeracy Skills

Abstract

Early numeracy development is critical to students' long-term academic success, particularly for learners receiving special education services who benefit from explicit, structured, and multisensory instruction. This study evaluated the effectiveness of the RoboKind® Numeracy intervention, a research-aligned curriculum grounded in Evidence-Based Practices, the Concrete–Representational–Abstract framework, I-VAKT™ techniques, and Universal Design for Learning. Using a quasi-experimental one-group pretest–posttest design, student performance was measured across three Acadience Math subtests: Number Identification Fluency (NIF), Next Number Fluency (NNF), and Advanced Quantity Discrimination (AQD) (N = 27). The intervention was implemented over a four-week period, during which students completed 12 structured lessons aligned to foundational numeracy skill development.

Paired-samples t-tests indicated statistically significant gains in foundational numeracy skills, including NIF, $t(26) = 2.23$, $p = .034$, and NNF, $t(26) = 2.10$, $p = .0458$. Although AQD growth was not statistically significant for the full sample, $t(26) = 1.68$, $p = .1047$, subgroup analysis revealed significant improvement within one pilot cohort. In addition to statistical outcomes, benchmark movement across assessments demonstrated meaningful instructional progress, with 17 students improving by at least one benchmark level from pre- to post-assessment. Findings provide preliminary evidence supporting RoboKind® Numeracy's effectiveness in improving early numeracy outcomes in diverse classroom settings.

Introduction

Early numeracy development is a critical component of students' long-term academic success, influencing later achievement in mathematics, problem-solving, and quantitative reasoning (Pearse & Walton, 2011; NCTM, 2000). Foundational numeracy skills—including number identification, counting, sequencing, and quantity comparison—form the basis for conceptual understanding and flexible mathematical thinking. When these skills are not firmly established, students are at increased risk for persistent math difficulties and reduced confidence in mathematics (Beilock, 2011).

Students receiving special education services, including neurodivergent learners, often require explicit, structured, and multisensory instruction to support early numeracy development (Tabor et al., 2021). Educators serving these students must balance instruction, assessment, documentation, and individualized supports across varied learning environments, frequently with limited access to numeracy interventions that that are feasible to implement with fidelity and align with Evidence-Based Practices (Hornigold, 2024).

RoboKind® Numeracy was developed to address these instructional needs

through a research-aligned, early numeracy curriculum designed for real-world classroom implementation. As part of RoboKind's Foundations, Numeracy integrates Evidence-Based Practices, multisensory learning experiences, and structured lesson design grounded in cognitive science and developmental theory (Hume et al., 2021; CAST, 2018).

The purpose of this study was to evaluate the effectiveness of the RoboKind® Numeracy intervention in improving students' early numeracy skills. Using a quasi-experimental, one-group pretest–posttest design, this study examined changes in student performance on three Acadience Math measures: Number Identification Fluency (NIF), Next Number Fluency (NNF), and Advanced Quantity Discrimination (AQD). Findings from this pilot study are intended to inform instructional practice and contribute to the growing evidence base for numeracy interventions used in special education and intervention settings.

Background

Early Numeracy and Conceptual Understanding

Numeracy extends beyond procedural computation to encompass sense-making, reasoning, and the meaningful application of numbers in context (Pearse & Walton, 2011; Tabor et al., 2021). Effective numeracy instruction supports students in recognizing numerical relationships, understanding quantities, and developing mental models that allow for flexible problem-solving (Wright, Martland, & Stafford, 2006). When instruction emphasizes procedures over conceptual understanding, students may struggle to transfer knowledge or apply mathematical thinking in novel situations (Stigler & Hiebert, 1999).

Early numeracy concepts are inherently abstract and can be particularly challenging for young learners and neurodivergent students (Tabor et al., 2021). Without intentional scaffolding and multisensory support, students may develop fragile understandings that contribute to math anxiety and underachievement (Beilock, 2011). National data reflect this concern, with only 26% of U.S. students demonstrating math proficiency by eighth grade (Beilock, 2011), and widespread reports of math anxiety interfering with working memory and learning processes.

Numeracy Instruction for Diverse Learners

Students in special education and autism-specific instructional settings often present with highly variable developmental, cognitive, and sensory profiles. Numeracy instruction in these contexts must therefore be flexible, accessible, and grounded in Evidence-Based Practices that support engagement, executive functioning, and conceptual understanding (Hume et al., 2021; NCAEP, 2020).

Instructional approaches that integrate predictable routines, multiple representations, and active engagement have been shown to reduce cognitive load and support learning for students with Autism Spectrum Disorder (ASD), Attention-Deficit/Hyperactivity Disorder (ADHD), and anxiety (Ashcraft & Krause,

2007; Swanson et al., 2009). Despite the importance of early numeracy, fewer research-based interventions exist for mathematics than for early literacy, particularly those designed explicitly for special education contexts (Hornigold, 2015, 2024).

Rationale for RoboKind® Numeracy

RoboKind® Numeracy Level 1 was intentionally designed to address these challenges by prioritizing the development of foundational Backbone Knowledge—the essential conceptual understandings that support all later mathematical learning (Wright et al., 2006). Just as the human backbone provides structure and stability, backbone knowledge provides the cognitive framework necessary for students to reason with numbers, recognize relationships, and apply mathematical thinking flexibly.

The curriculum comprises 70 interactive lessons organized into four sequenced units. Units 1 and 2 focus on number recognition, counting, sequencing, and quantity relationships, while Units 3 and 4 extend this foundation by supporting students in comparing quantities and solving equations within 20. Instruction aligns with national mathematics standards and common numeracy-related Individualized Education Program (IEP) goals (Common Core State Standards Initiative, 2021; NCTM, 2000; NAEYC, 2020).

RoboKind® Numeracy is grounded in the science of learning and systematically applies the Concrete–Representational–Abstract (CRA) instructional framework, which aligns with neurological development in numeracy learning and supports long-term retention and transfer (Witzel, Mercer, & Miller, 2008; Ansari, 2008; Menon, 2015). Students engage first with concrete experiences, then pictorial representations, and finally abstract symbols and equations.

To further support diverse learners, the curriculum integrates I-VAKT™ (Interactive Technology, Visual, Auditory, Kinesthetic, and Tactile) techniques and Universal Design for Learning (UDL) principles to reduce cognitive load, support working memory, and increase engagement (CAST, 2018; Immordino-Yang & Damasio, 2007; Redcay, 2014). These design elements are particularly beneficial for students with ASD, ADHD, anxiety, and dyscalculia, while representing best practices for all learners (Butterworth, 2005; NCAEP, 2020).

A growing body of research across RoboKind's Foundations curricula demonstrates increased student engagement, enjoyment, and learning outcomes when instruction is delivered through this integrated, multisensory framework (Kroiss, Sonego, & Rollins, 2021; Raiford, 2021; Redcay, 2014). Given the critical role of early numeracy in academic success and the need for effective, scalable interventions in special education settings, systematic evaluation of RoboKind® Numeracy is both timely and necessary.

Participants

Participants in this study were drawn from two pilot implementations of the RoboKind® Numeracy program: our Ambassador Program and a North Carolina School Pilot. The initial sample included 20 students supported by 7 teachers from our RoboKind® Ambassador Program and 18 students supported by 4 teachers from the North Carolina pilot.

Only students who completed both the pre-intervention and post-intervention assessments were included in the paired analyses. Two students from the North Carolina pilot group and nine students from the Ambassador Program group did not complete both assessments and were therefore excluded. The final analytic sample consisted of 27 students (N = 27).

North Carolina Pilot Sample

Students in the North Carolina pilot represented a wide range of grade levels, spanning kindergarten through ninth grade. Of the 16 North Carolina students included in the final sample, the majority were enrolled in early elementary grades, with 10 students (62.5%) in kindergarten through third grade (K–3). Four students (25%) were in upper elementary grades (4–6), and two students (12.5%) were in secondary grades (ninth grade). This distribution reflects the inclusion of both foundational and more advanced learners within the North Carolina pilot context.

Ambassador Program Sample

The Ambassador Program sample included students receiving special education services in autism-specific instructional settings (AU). Participating educators implemented the program with small groups of students at their schools across Georgia, Pennsylvania, Indiana, and Ohio. Students were enrolled in multi-grade classrooms spanning kindergarten through sixth grade, as well as students assigned to individual grade levels between first and sixth grade. These instructional environments are characteristic of specialized settings designed to support students with diverse learning and developmental needs.

Together, the North Carolina Pilot and Ambassador Program samples represent a heterogeneous group of learners across grade levels and instructional contexts, reflecting the real-world implementation of RoboKind® Numeracy in varied special education and intervention settings across multiple states.

Intervention: RoboKind® Numeracy

Implementation

The RoboKind® Numeracy intervention was implemented by participating teachers within their existing instructional schedules. Teachers integrated RoboKind® Numeracy lessons as part of their math instruction or intervention blocks, using the program's structured, no-prep lesson design. Instruction incorporated interactive digital delivery led by RoboKind's Virtual Avatar, multisensory learning activities aligned to the Concrete–Representational–Abstract (CRA) framework, and embedded formative assessment opportunities. The intervention was delivered over a four-week period, during which students completed 12 structured lessons aligned to foundational numeracy skill development.

Teachers received guidance on implementation expectations prior to the start of the study and were instructed to deliver the curriculum with fidelity as designed. Implementation varied naturally across classrooms due to differences in grade levels, instructional settings (e.g., self-contained AU classrooms, multi-grade classrooms, and individual grade-level placements), and student support needs. This variability reflects authentic classroom conditions and enhances the ecological validity of the findings.

Limitations

Several limitations should be considered when interpreting the results of this study. First, the study employed a quasi-experimental, one-group pretest–posttest design without a control or comparison group. As a result, causal conclusions cannot be definitively drawn, and improvements cannot be attributed solely to the RoboKind® Numeracy intervention without considering other instructional influences.

Second, the sample size was relatively small (N = 27), and participants were drawn from pilot sites that may not be representative of the broader student population. Additionally, students spanned a wide range of grade levels (kindergarten through ninth grade), resulting in heterogeneous baseline skill levels. While this reflects real-world special education settings, it may have contributed to variability in outcomes and limited statistical power, particularly higher-level skills such as Advanced Quantity Discrimination (AQD).

Third, ceiling effects were observed for some upper elementary and secondary students who began the study at or near benchmark levels, reducing the likelihood of detecting statistically significant growth on certain measures. This was especially evident in AQD results for the combined sample.

Finally, assessment administration and scoring were conducted by classroom teachers, which may introduce variability despite the use of standardized scripts and procedures. While teachers followed Acadience administration guidelines, future studies could benefit from independent assessors or inter-rater reliability checks.

Methodology

This study employed a quasi-experimental, one-group pretest–posttest design to evaluate the impact of the RoboKind® Numeracy intervention on student performance. As part of the assessment process, students completed three Acadience Math subtests at both pretest and posttest: Number Identification Fluency (NIF), which measures automaticity in recognizing numbers from 1–100; Next Number Fluency (NNF), which assesses the ability to identify the next number in a sequence; and Advanced Quantity Discrimination (AQD), which evaluates students' ability to compare the value of numbers. Because the same students were assessed at two time points, a paired-samples t-test was used to determine whether the mean difference between pre- and post-intervention scores was statistically significant. This analytic approach is appropriate for examining within-subject change and assessing improvement associated with participation in the RoboKind® Numeracy program.

Acadience Math Assessment

For the research study, Acadience Math Progress Monitoring was used as a pre- and post-assessment. Acadience provides benchmark goals that are criteria-referenced target scores for students to achieve at specific times of the year. The cut points for risk help identify students who are likely to need additional math support beyond the core instruction. There are four benchmark levels connected to scores that students are likely to score at this level.

According Acadience (2025):

- ***Above Benchmark*** "overall likelihood of achieving subsequent math goals: 90 to 99%"
- ***At Benchmark*** "overall likelihood of achieving subsequent math goals: 70-85%"
- ***Strategic*** "overall likelihood of achieving subsequent math goals: 40-60%"
- ***Intensive*** "overall likelihood of achieving subsequent math goals: 10-20%"

For this research study, three subsets of the Acadience test were used. Each assessment is administered one-on-one between the teacher and student for one minute. Each teacher followed the provided Accidence script to administer the test with fidelity. The teacher hand-scored the assessment and reported the scores in a Google Form. Pseudonyms were used to represent each student who participated in the study to protect the confidentiality of the participants. All data was secured and protected.

Acadience Assessments

Three assessments were used as a part of the research study: Number Identification Fluency (NIF), Next Number Fluency (NNF), and Advanced Quantity Discrimination (AQD).

- ***Number Identification Fluency (NIF)*** – Automaticity in recognizing numbers from 1-100.
- ***Next Number Fluency (NNF)*** – Ability to identify the following number in a sequence.
- ***Advanced Quantity Discrimination (AQD)*** – Ability to compare the value of numbers.

Number Identification Fluency (NIF)

The purpose of the Acadience NIF is to test students' ability to recognize numbers 1-100 automatically. Students state the names of as many randomized numbers as they can recognize within one minute. Students should be able to identify the number in three seconds or less. For example, the student sees the number five and automatically says, "5."

The following benchmarks from Acadience (2025) for kindergarten students, in the middle of the year, were used when analyzing the research data because Numeracy Level 1 aligns with kindergarten standards and goals, and the assessment was completed during the middle of the school year.

Number Identification Fluency (NIF) Scoring Criteria (Middle of Kindergarten)

- Above (21+)
- Benchmark (14-20)
- Strategic (8-13)
- Intensive (0-7)

Next Number Fluency (NNF)

The purpose of the Acadience NNF is to test students' ability to identify the next number in a sequence to 100. Within one minute, students see a random number and state the number that comes next in a sequence of numbers to 100. The NNF is a more advanced skill than NIF because students not only need to recognize the number but also what comes after it. For example, the student sees the number seventy-one and recognizes the number and the next number, so the student says, "72."

The following benchmarks from Acadience (2025) for kindergarten students, in the middle of the year, were used when analyzing the research data because Numeracy Level 1 aligns with kindergarten standards and goals, and the assessment was completed during the middle of the school year.

Next Number Fluency (NNF) Scoring Criteria (Middle of Kindergarten)

- Above (13+)
- Benchmark (11-12)
- Strategic (7-10)
- Intensive (0-6)

Advanced Quantity Discrimination (AQD)

The purpose of the Acadience AQD is to test students' ability to compare two numbers and determine which is greater. Quantity discrimination (greater than/less than) is a higher-level skill that helps students develop the ability to recognize each number and understand the value to compare the quantities. Within one minute, students are shown a pair of random numbers, and the student must quickly identify which is greater. For example, the student sees a pair of numbers like 17 and 67, recognizes the numbers and their relationship, and when prompted for the greatest number, the student responds with, "67."

The following benchmarks from Acadience (2025) for first-grade students, at the beginning of the year, were used when analyzing the research data because assessment benchmarks are not provided for kindergarten. Therefore, the benchmark closest to the target goal was used.

Advanced Quantity Discrimination (AQD) Scoring Criteria (Beginning of First Grade)

- Above (13+)
- Benchmark (10-12)
- Strategic (6-9)
- Intensive (0-5)

Data Analysis and Results

Data Preparation and Analytic Approach

Student-level pretest and posttest scores were collected for three Acadience Math subtests: Number Identification Fluency (NIF), Next Number Fluency (NNF), and Advanced Quantity Discrimination (AQD). Only students who completed both pre- and post-assessments were included in the paired analyses. As a result, two students from the North Carolina Pilot group and nine students from the Ambassador Program group were excluded, yielding a final analytic sample of N = 27 students.

Because the same students were assessed at two time points, paired-samples t-tests were conducted to examine within-subject changes in performance following participation in the RoboKind® Numeracy intervention. This analytic approach is appropriate for detecting mean differences in repeated measures

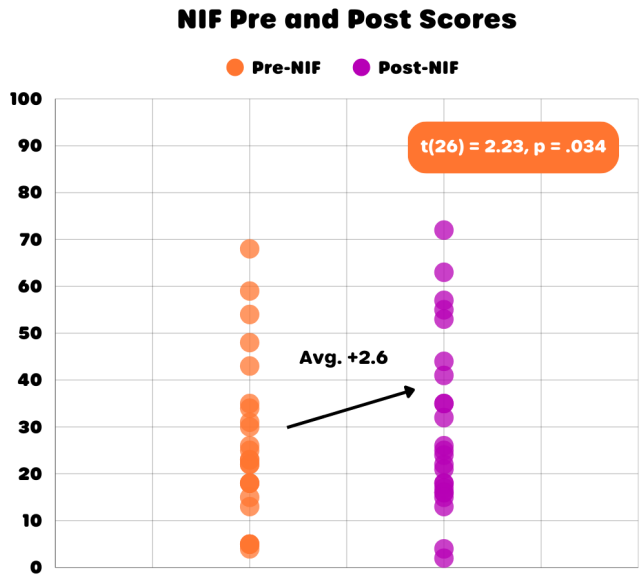
designs and is commonly used in educational intervention research. Statistical analyses were conducted using Microsoft Excel's Data Analysis Toolpak and the T.TEST function with a two-tailed significance threshold of $\alpha = .05$.

In addition to inferential analyses, descriptive benchmark analyses were conducted to examine pre–post movement within and across Acadience benchmark categories. This supplemental analysis provided instructional context for understanding patterns of growth, maintenance, or variability across grade levels and instructional settings.

Research Questions

Research Question 1: Number Identification Fluency (NIF)
To what extent does participation in the RoboKind® Numeracy intervention improve students' performance on Number Identification Fluency (NIF)?

A paired-samples t-test was conducted to compare students' pretest and posttest NIF scores. Results from the combined North Carolina and Ambassador dataset indicated a statistically significant increase in NIF scores following the intervention, $t(26) = 2.23$, $p = .034$ (two-tailed). The null hypothesis was rejected, and the alternative hypothesis was supported.

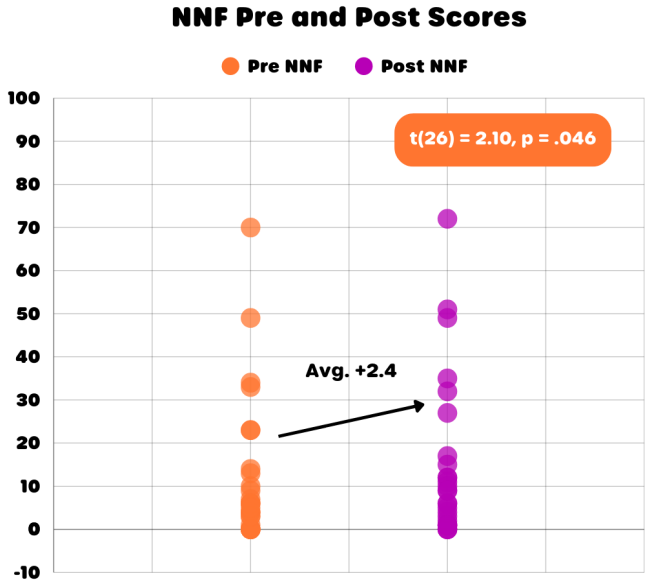


In addition to overall score increases, 3 students demonstrated upward movement across Acadience benchmark levels on NIF, with 2 students moving from Intensive to Benchmark and 1 student moving from Benchmark to Above. While many students began at higher benchmark levels, limiting observable movement due to ceiling effects, these shifts indicate meaningful improvement in foundational number recognition for students with the greatest instructional need.

These findings indicate that students demonstrated measurable gains in number recognition automaticity after participating in RoboKind® Numeracy. Improvement in NIF performance suggests that the intervention effectively supported foundational numeracy skills related to rapid identification of numerals, a critical prerequisite for higher-level mathematical learning.

Research Question 2: Next Number Fluency (NNF)
To what extent does participation in the RoboKind® Numeracy intervention improve students' performance on Next Number Fluency (NNF)?

A paired-samples t-test comparing pretest and posttest NNF scores revealed a statistically significant increase for the combined sample, $t(26) = 2.10$, $p = .0458$ (two-tailed). The null hypothesis was rejected, and the alternative hypothesis was supported.



In addition to overall score increases, 6 students demonstrated upward movement across Acadience benchmark levels on NNF, with 1 student moving from Intensive to Strategic, 2 students moving from Intensive to Benchmark, 1 student moving from Strategic to Benchmark, and 2 students progressing from Benchmark to Above. These gains reflect improvements not only in accuracy but also in students' ability to understand and apply numerical sequencing, a key component of early number sense development.

These results indicate that participation in the RoboKind® Numeracy intervention was associated with improved student ability to identify the next number in a sequence. Gains in NNF performance reflect growth in both number recognition and sequential number knowledge, aligning with the program's emphasis on structured practice, repetition, and multisensory engagement.

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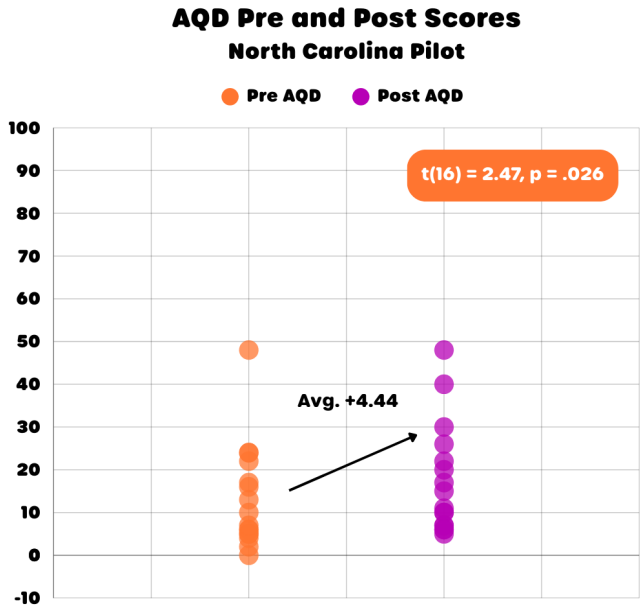
Research Question 3: Advanced Quantity Discrimination (AQD)
To what extent does participation in the RoboKind® Numeracy intervention improve students' performance on Advanced Quantity Discrimination (AQD)?

A paired-samples t-test conducted on AQD pretest and posttest scores for the combined dataset did not yield statistically significant results, $t(26) = 1.68$, $p = .1047$ (two-tailed). As a result, the null hypothesis was not rejected, and the alternative hypothesis was not supported for the full sample.

Although mean AQD scores increased from pretest to posttest, the observed change did not reach statistical significance. However, a subgroup analysis of the CCCS pilot dataset alone revealed a statistically significant improvement in AQD scores, $t(26) = 2.48$, $p = .03$. This finding suggests that AQD growth may be more sensitive to student characteristics, baseline skill levels, or instructional context.



In addition to overall score increases, 8 students demonstrated upward movement across Acadience benchmark levels on AQD, with 2 students moving from Intensive to Benchmark, 3 students moving from Intensive to Strategic, 1 student progressing from Intensive to Above Benchmark, 1 student progressing from Strategic to Benchmark, and 1 student progressing from Benchmark to Above Benchmark. Although overall statistical significance was not achieved for the full sample, these benchmark shifts highlight meaningful growth in higher-order numeracy skills for a subset of students, particularly those starting at lower performance levels.

Given that AQD assesses higher-order numeracy skills related to magnitude comparison, it is possible that longer intervention durations or more targeted instructional supports are necessary to produce statistically detectable gains across heterogeneous samples.

Benchmark Movement and Descriptive Patterns

Analysis of pre–post benchmark classifications revealed meaningful instructional patterns across grade levels and instructional settings. Overall, 17 students demonstrated increases in benchmark level, with 9 students improving by two or more benchmark levels, indicating substantial progress in foundational numeracy performance across the sample. Many early elementary students (grades 1–3) demonstrated upward movement within or across benchmark categories on NIF and NNF, reflecting improved accuracy and fluency in foundational numeracy skills.

Upper elementary and secondary students (grades 4–9) frequently entered the study at or near benchmark or above-benchmark levels. For these students, growth was often constrained by ceiling effects; however, maintenance of proficiency was commonly observed, suggesting that RoboKind® Numeracy supported skill retention even when large gains were less likely.

Students in autism-specific (AU) or multi-grade classroom settings exhibited highly variable performance patterns. Some students demonstrated notable gains in posttest scores and benchmark classifications, while others showed minimal change or slight decreases. This variability reflects the diverse developmental and instructional profiles characteristic of specialized educational environments and underscores the importance of individualized progress monitoring.

Discussion

Findings from this study indicate that participation in the RoboKind® Numeracy intervention was associated with statistically significant improvements in foundational numeracy skills related to number identification and counting sequences. Specifically, students demonstrated significant gains on Number Identification Fluency (NIF) and Next Number Fluency (NNF) across the combined sample.

These results suggest that RoboKind® Numeracy is particularly effective in strengthening early numeracy automaticity and sequential number knowledge—skills that are foundational to later mathematical learning. Improvements in NIF and NNF align with the curriculum's emphasis on repeated practice, multisensory engagement, and explicit instruction through the CRA framework.

Although gains in Advanced Quantity Discrimination (AQD) did not reach statistical significance for the combined sample, the North Carolina Pilot subgroup did demonstrate significant improvement. This pattern suggests that AQD growth may be more sensitive to developmental readiness, baseline skill level, or duration of intervention. Because AQD represents a higher-order numeracy skill, longer implementation periods or targeted instruction may be necessary to produce statistically detectable gains across more diverse samples.

Importantly, qualitative benchmark pattern analysis revealed meaningful instructional insights beyond statistical significance alone. Many early elementary students moved upward within or across benchmark categories, while older students generally maintained proficiency—an important outcome for students already meeting expectations. Variability observed among students in AU and multi-grade classrooms reflects the diverse learning profiles typical of specialized instructional environments and underscores the importance of individualized progress monitoring.

Educator Feedback and Implementation Insights

In addition to quantitative assessment outcomes, participating educators provided qualitative feedback regarding their experiences implementing RoboKind® Numeracy during the pilot period. Teacher responses consistently highlighted the program's ability to support student engagement, reinforce foundational number concepts, and provide structured, cumulative learning opportunities for students requiring additional instructional support.

Educators noted that RoboKind® Numeracy's incremental, number-by-number progression helped students build confidence and understanding over time, particularly for learners who benefit from repetition and scaffolded instruction. Several teachers emphasized the value of hands-on materials, such as number blocks, in supporting students' ability to visualize quantities and represent multi-digit numbers. Others reported that students demonstrated increased motivation and anticipation for math instruction, with some students requesting "math time" and identifying it as a favorite part of the school day.

> *"RoboKind® Numeracy kept my students engaged and excited to learn. The use of NumberBlocks helped students visualize how to represent double-digit numbers, making abstract concepts much more accessible."*
>
> Pilot Survey Response

> *"RoboKind® Numeracy builds foundational math understanding one number at a time, providing students who need extra support with structured, interactive practice that strengthens number sense."*
>
> Pilot Survey Response

> *"After just one week of implementation, students were asking for 'math time' and telling us it was their favorite part of the day."*
>
> Pilot Survey Response

Teachers working in autism-specific instructional settings described RoboKind® Numeracy as a highly engaging, research-informed pathway that supported sustained attention and reduced cognitive fatigue. Features such as interactive activities, intentional repetition, and embedded brain breaks were reported to promote focus and participation while maintaining student motivation.

Teachers reported that RoboKind® Numeracy increased students' number sense understanding (M = 4.43/5). Perceived student engagement was rated highly (M = 4.71/5), with the majority of respondents selecting "Strongly Agree." Teachers similarly indicated that RoboKind® Numeracy was easy to implement within their instructional settings (M = 4.71/5).

These findings suggest strong social validity for the intervention. Collectively, educator feedback suggests that RoboKind® Numeracy not only supports foundational numeracy skill development but also enhances the instructional experience for both students and teachers. Such perceptions are critical indicators of sustainability and scalability in real-world educational settings.

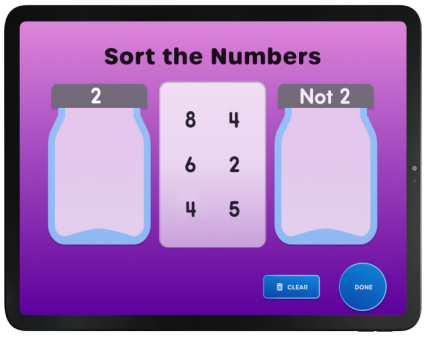
Conclusion

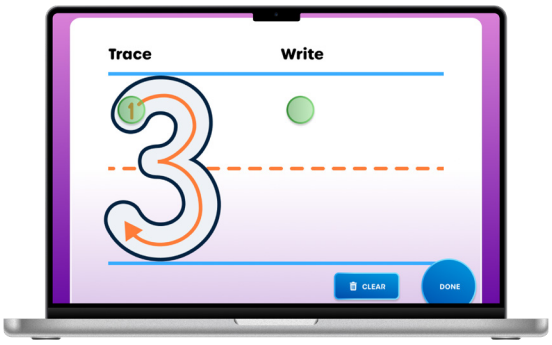
This quasi-experimental pre–post study provides promising preliminary evidence supporting the effectiveness of RoboKind® Numeracy in improving early numeracy skills, particularly in number identification and counting fluency. Statistically significant gains in NIF and NNF indicate that students demonstrated measurable improvement following participation in the intervention.

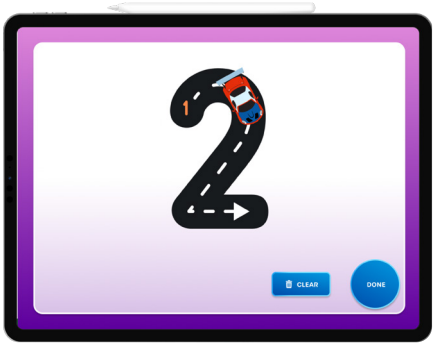
While results for Advanced Quantity Discrimination were mixed, subgroup analyses and descriptive trends suggest potential growth with extended implementation or targeted instructional supports. Taken together, these findings highlight RoboKind® Numeracy as a viable, research-aligned intervention for supporting early numeracy development in diverse educational settings, including special education and autism-specific classrooms.

Future research should build upon these findings by incorporating larger samples, comparison groups, and extended implementation timelines. Additional analyses examining dosage, fidelity, and subgroup responsiveness will further strengthen the evidence base and inform best practices for implementation.

Overall, the results of this study contribute to RoboKind's growing body of research demonstrating the program's capacity to support measurable student growth while remaining accessible, engaging, and feasible for teachers in real-world classroom environments.







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About RoboKind®

RoboKind® envisions a future where ALL students and their teachers are able to celebrate the joy and success of learning together.

By providing appropriate, equitable, engaging, effective learning opportunities centered on a strong pedagogical framework, research-based and play-based strategies, and I-VAKT™ (Interactive Technology, Visual, Auditory, Kinesthetic, and Tactile) experiences, we can develop neural pathways for mastering foundational competencies that respect the accessibility needs of neurodiverse, early childhood, and all students.

Supporting the "each" in teaching

RoboKind's Virtual Avatars are transforming how students engage with the curriculum and achieve their goals! The interactive nature of these Virtual Avatars create learning experiences that incorporates Evidence-Based Practices, such as Visual Supports, Video Modeling, and Social Narratives. Students have the opportunity to learn through play, utilizing multisensory inputs and strategies that light up the brain!

Special Tech for Exceptional Connections

By learning with the Virtual Avatars, students can immerse themselves across various learning domains, including cognitive, social, emotional, and behavioral. Educators can select lessons that target students' individual goals, creating a personalized learning experience.