

FIELD-BASED CASE STUDY

Primary Numeracy Framework & NWEA MAP Assessment: A Correlation Study

*Examining Whether Progress on the Primary Numeracy Framework
Predicts Measurable Growth on the NWEA MAP for At-Risk Early Learners*

Study Period:	2015 – 2018
Sample Size:	55 Students Grades 1–3
Setting:	Early Elementary Real-World Classroom
Conducted by:	Numeracy Consultants in collaboration with classroom educators
Published:	2018 Practitioner-Led Research

ABSTRACT

Abstract

From 2015 to 2018, Numeracy Consultants, in partnership with classroom educators, conducted a field-based case study to explore whether student growth on the Primary Numeracy Assessment and Framework—components of the Primary Numeracy Intervention Program—aligned with gains on the NWEA MAP Assessment, a widely used adaptive, research-based growth measure. Over the four-year period, 55 early elementary students identified as at-risk participated in targeted math intervention for a minimum of 12 weeks.

The findings revealed that most students who demonstrated progress on the Primary Numeracy Framework also showed measurable growth on the NWEA MAP, suggesting a strong, though not universal, correlation between the two measures. The study was implemented by practitioners in real school settings, not by academic researchers, and reflects the realities of applied intervention work rather than controlled experimental design.

While the results are encouraging, limitations such as the small sample size, short-term intervention window, and narrow grade range call for cautious interpretation. Nevertheless, the study offers promising evidence that the Primary Numeracy Framework can be an effective and predictive tool for guiding math instruction and supporting growth among struggling early learners.

Keywords: early numeracy intervention · NWEA MAP · formative assessment · at-risk learners · primary numeracy framework · math intervention · RIT growth

1. INTRODUCTION

Early numeracy skills are widely recognized as foundational to students' long-term academic success and future achievement in mathematics (Duncan et al., 2007; National Mathematics Advisory Panel, 2008). Research consistently shows that when students experience difficulty in early mathematics, those challenges can compound over time, underscoring the importance of timely, well-designed intervention (Gersten et al., 2009).

Effective intervention relies not only on early identification, but also on high-quality assessment systems that translate data into meaningful instructional action (Fuchs & Fuchs, 2006). Formative assessments that provide detailed, skill-specific feedback empower educators to adjust instruction responsively and strategically, leading to improved student outcomes (Black & Wiliam, 1998; Heritage, 2010).

The NWEA Measures of Academic Progress (MAP) assessment is widely used to monitor academic growth, offering adaptive, norm-referenced data that supports goal setting and personalized learning pathways (Betebenner, 2009). While MAP provides valuable information about overall growth trends, it offers less diagnostic specificity regarding the discrete numeracy skills that often drive targeted intervention planning.

To address this complementary need, this study—conducted from 2015 to 2018 by Numeracy Consultants in collaboration with classroom teachers—examined the relationship between growth on the Primary Numeracy Framework, a diagnostic and instructional tool, and growth on the NWEA MAP assessment for at-risk students in Grades 1 through 3. Implemented in authentic classroom settings rather than controlled academic research

environments, the study was designed to evaluate both the practical effectiveness and predictive validity of the framework in real-world conditions.

1.1 Research Question

Does progress on the Primary Numeracy Framework predict measurable growth on the NWEA MAP Assessment in early elementary at-risk students receiving targeted math intervention?

2. METHODOLOGY

2.1 Study Duration & Sample

The study was conducted over four consecutive academic years (2015–2018), tracking the progress of 55 students for a minimum of 16 weeks each year. Annual participation is summarized in Table 1.

Academic Year	Students Enrolled	Cumulative Total
2015–2016	14	14
2016–2017	17	31
2017–2018	11	42
2018–2019	13	55

Table 1. Annual student enrollment by academic year.

2.2 Participant Demographics

Participants were drawn from Grades 1–3 (ages 6–9). Table 2 provides a full demographic breakdown of the 55-student cohort.

Category	Subgroup	n	%
Age Range	6–9 years	55	100%
Grade	Grade 1	—	—
	Grade 2	—	—
	Grade 3	—	—
Race / Ethnicity	Caucasian	27	49%
	Hispanic	14	25%
	African American	12	22%

	Other	2	4%
Gender	Female	29	53%
	Male	26	47%

Table 2. Participant demographic breakdown (N = 55).

2.3 Qualification Criteria

Students were screened using the NWEA MAP assessment at the beginning of each academic year (August–September). Eligibility for inclusion required one of the following:

- Scoring below the **30th percentile** on the NWEA MAP
- Meeting state or federal **at-risk identification standards**

Only qualifying students received the intervention and were included in the study data. Post-intervention assessments were administered in December–January of the same academic year.

2.4 Intervention Design

Each qualifying student participated in a structured numeracy intervention program. Table 3 summarizes the key parameters of the intervention protocol.

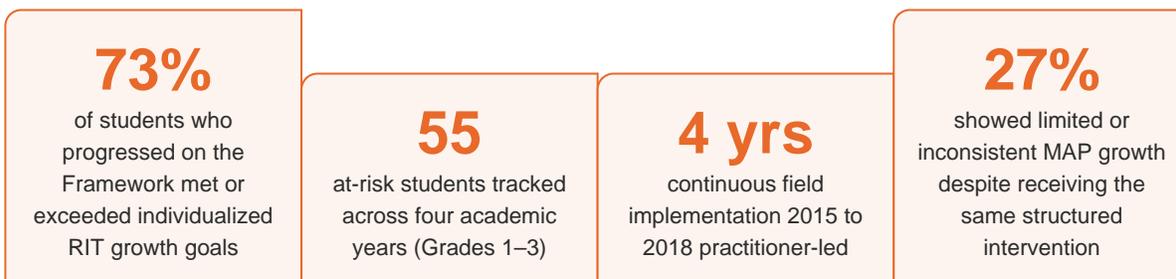
Parameter	Specification
Duration	Minimum 12 weeks
Frequency	At least 4 days per week
Instructional Time	No less than 90 minutes per week
Group Format	1:1 or small group (≤ 5 students)
Assessment Tool	Primary Numeracy Assessment
Instructional Framework	Primary Numeracy Framework (skill-level guided)
Professional Development	Training by Numeracy Consultants

Table 3. Intervention protocol specifications.

3. RESULTS

3.1 Primary Finding: Framework Progress Mirrors MAP Growth

Analysis of the data revealed that when students made progress on the Primary Numeracy Framework, most—but not all—showed corresponding growth on the NWEA MAP Assessment, suggesting a strong, though not perfect, correlation between the two measures of student development.



Students who met their RIT growth targets showed measurable movement through multiple levels of the framework, indicating meaningful gains in conceptual understanding. The remaining 27% of students, despite receiving the same structured intervention, showed limited or inconsistent progress. Some advanced on the Primary Numeracy Framework but did not meet their RIT growth targets on the MAP assessment, indicating that gains on the framework did not always translate into measurable MAP growth for all learners.

This pattern suggests that the Primary Numeracy Framework is **generally predictive** of MAP growth, but not universally so. Factors such as learning profiles, attendance, intervention intensity, and teacher quality may have influenced outcomes for students who did not show parallel gains.

3.2 Grade-Level and Instructional Format Findings

- **Grade 2 students** demonstrated the most significant average growth on both the Primary Numeracy Framework and the MAP assessment. While this may be partly attributable to sample size variability, it could also reflect a developmental sweet spot for numeracy acquisition among second-grade learners.
- **No observable difference in outcomes** was found based on instructional format: students receiving one-on-one intervention performed similarly to those in small group settings (≤ 5 students), reinforcing the efficiency and flexibility of the program design and providing practical guidance for resource allocation.

Outcome Metric	Finding	Implication
73% met/exceeded RIT goals	Strong positive correlation between framework progress and MAP growth	Framework is generally predictive of MAP performance
27% did not meet RIT goals	Framework gains did not universally translate to MAP growth	Individualized factors may moderate intervention effectiveness
Grade 2 highest growth	Greatest average gains on both measures	Possible developmental optimization window
No group-size effect	1:1 and small-group outcomes were comparable	Flexible delivery without sacrificing efficacy

Table 4. Summary of key results and implications.

4. DISCUSSION

These findings affirm the Primary Numeracy Framework as a valid, actionable tool for both screening and instruction. The strong alignment with MAP growth results suggests that when implemented with fidelity, the program can not only support measurable gains but also empower educators with precision in their intervention planning.

One particularly valuable insight was the lack of dependence on group size for student growth, suggesting flexibility in staffing and scheduling without compromising intervention outcomes. Schools facing resource constraints can distribute intervention support more broadly without sacrificing effectiveness.

Teacher feedback reinforced the program's usability and instructional relevance. The consistent identification of hidden skill gaps by the framework indicates that many struggling students might otherwise remain underserved without this level of targeted diagnostic insight. This aligns with existing literature on the importance of formative assessment in closing achievement gaps (Black & Wiliam, 1998).

5. IMPLEMENTATION CONTEXT

It is important to highlight that this field study was conducted through a **practitioner-led model** rather than by a university-affiliated research team or independent academic institution. The study was led by Numeracy Consultants in close collaboration with classroom teachers, allowing the Primary Numeracy Framework to be evaluated in authentic, real-world school environments. This approach prioritized instructional relevance, practical feasibility, and meaningful classroom impact using tools and implementation methods accessible to educators.

Although the study did not operate within the highly controlled conditions typical of formal academic research, consistent protocols were maintained for assessment, data collection, and intervention delivery. This design reflects a deliberate emphasis on **applied field research**—focusing on how the framework performs in everyday instructional settings where teachers and students naturally engage with the work.

Future partnerships with university or independent research institutions could further strengthen the research base by complementing these applied results with more experimental methodologies, building on the strong foundation established through authentic classroom implementation.

6. LIMITATIONS

While the findings of this study are promising, several significant limitations must be acknowledged:

1. *Sample Size*

The study included 55 students across four years, with annual subgroup sizes ranging from 11 to 17 students. Although this allowed for meaningful trend analysis within cohorts, expanding the sample size in future studies would strengthen statistical power and enhance confidence in generalizing the findings. Broader participation would also help ensure that year-to-year variations reflect consistent patterns rather than cohort-specific influences.

2. *Grade-Level Focus*

The research centered on early elementary students (Grades 1–3), offering valuable insight into foundational numeracy development. Expanding the study to include upper elementary and middle-grade students would provide a fuller picture of how the Primary Numeracy Framework supports learning across developmental stages and determine whether similar correlations with MAP growth persist in older populations.

3. *Intervention Time Frame*

Student outcomes were measured over a 12–16 week intervention period, demonstrating promising short-term growth. Future longitudinal tracking would offer insight into long-term retention, sustained achievement, and performance on summative state assessments, helping to better understand the durability and lasting impact of the gains observed.

4. *Practitioner-Led Design*

As a practitioner-led study, the absence of a control group, randomized assignment, or external evaluators limits causal inference. Results should be interpreted as correlational evidence of effectiveness rather than definitive proof of causal impact.

7. CONCLUSION

This four-year field study demonstrates that the Primary Numeracy Framework is a robust and practical tool for guiding early math intervention. The evidence shows a strong positive correlation between student progress on the framework and growth on the NWEA MAP Assessment, with **73% of students meeting or exceeding their individualized growth targets**. These results underscore the framework's effectiveness in promoting measurable academic gains for the majority of at-risk learners.

Importantly, the study also reveals that **intervention effectiveness does not depend on instructional group size**, providing schools with flexible options for delivering support without compromising outcomes. Teacher feedback further validates the framework's diagnostic precision and instructional value, highlighting its role in uncovering hidden skill gaps and empowering educators to tailor instruction effectively.

While promising, the findings also reflect variability among students—nearly one quarter did not meet growth goals—indicating a need for ongoing refinement and differentiated approaches to fully meet diverse learner needs. Future research with larger, more diverse samples and longer-term follow-up is recommended to build on these insights.

Overall, the Primary Numeracy Framework represents a meaningful advancement in early math intervention, aligning diagnostic assessment with actionable instruction to support sustained student growth across varied classroom contexts.

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