Mathletics

The Impact of Mathletics on NAPLAN Numeracy Performance: A Research Study

Powered by 3P Learning

Published August 2025

Executive Summary

This study provides compelling evidence that students using Mathletics consistently outperform their peers in NAPLAN numeracy assessments. Analysis of over 1,000 schools reveals a strong, statistically significant link between Mathletics usage and higher scores in both Year 3 and Year 5.

NAPLAN and Mathletics: A clear correlation

NAPLAN is Australia's nationwide benchmark for student performance in literacy and numeracy. For this study, we focused on numeracy results for Year 3 and Year 5 students and compared outcomes between schools using Mathletics (with active usage from June 2023 – February 2024) and schools not using Mathletics during the same period.

Our analysis reveals a strong, positive correlation: schools using Mathletics consistently achieved higher NAPLAN numeracy scores than non-Mathletics schools.

More importantly, we found a clear pattern within Mathletics schools: the more students used the platform, the better their results.

We used rigorous statistical techniques, including stratified sampling, bootstrapping and regression analysis to ensure the findings are reliable and not the result of cherry-picked data.

Just 15–30 minutes a week makes a real difference

Students who used Mathletics for 15–30 minutes per week achieved significantly higher NAPLAN scores compared to non-users. Mathletics users show a clear learning advantage, particularly in the upper grades.

Year 3 findings: Mathletics boosts performance

Mathletics schools averaged a score of 405.4. Non-Mathletics schools averaged 397.8. On average, Year 3 students scored 7.6 points higher than their peers who did not use the program. Confidence interval: 95% [403.4, 408.8] vs [394.5, 400.4]. Effect size (Cohen's d) = 4.52 (large impact). This is a statistically significant improvement in performance.

Year 5 findings: Consistent and even greater gains

Mathletics schools averaged a score of 487.5. Non-Mathletics schools averaged 477.9. On average, Year 5 students scored 9.6 points higher than their peers who did not use the program. Effect size (Cohen's d) = 5.98, even stronger than in Year 3.

Usage Matters: More engagement drives better results

Among Mathletics users, students with higher weekly usage achieved significantly better NAPLAN results than those with lower usage. Increasing usage from 15 to 30 minutes per week led to an additional boost in scores, highlighting the impact of consistent practice. Students who used Mathletics for just 15–30 minutes a week scored 9.6 points higher in Year 5: that's more than 10% of the typical two-year growth seen between Year 3 and Year 5 on NAPLAN.

Conclusion: Mathletics works

Using Mathletics significantly improves student outcomes in mathematics. The correlation is strong, the analysis is statistically robust and the message is clear: Mathletics is an effective tool for improving numeracy performance.

NAPLAN Numeracy Assessment

The National Assessment Program – Literacy and Numeracy (NAPLAN) is Australia's standardised testing framework for mathematical and literacy competencies. Conducted annually across Years 3, 5, 7 and 9, NAPLAN generates comparative performance data through consistent assessment protocols.

Numeracy assessment within NAPLAN evaluates students' mathematical understanding across curriculum-aligned domains. Assessment scores are calibrated on a continuous scale, enabling longitudinal tracking and cross-cohort comparison.

For this research, analysis focuses on numeracy outcomes for Years 3 and 5 cohorts. Year 3 numeracy scores range from 136 to 555, with a national mean of 399.9. Year 5 numeracy scores range from 187 to 669, with a national mean of 480.4.

Mathletics Digital Learning Platform

Mathletics is an online mathematics program for students aged 5–16, providing curriculum-aligned mathematical instruction through interactive digital activities.

The platform employs mastery-based progression where students advance through mathematical concepts after demonstrating competency in previous topics.

The program incorporates immediate feedback mechanisms and differentiated content delivery. Reporting functions enable educators to track student progress and identify performance patterns across mathematical domains.

Educational Components and Research Objectives

During the study period leading up to the 2024 NAPLAN testing, Mathletics contained two primary instructional components designed to enhance mathematical performance: Skill Quests and Activities.

Skill Quests provide curriculum-aligned mathematics questions where students demonstrate mastery before progressing to more challenging content, building foundational competency.

Activities encompass interactive mathematical exercises and problem-solving tasks that reinforce mathematical concepts. The platform also includes **Problem Solving and Reasoning** activities that encourage students to apply mathematical knowledge to complex situations, developing critical thinking capabilities essential for mathematical assessment success.

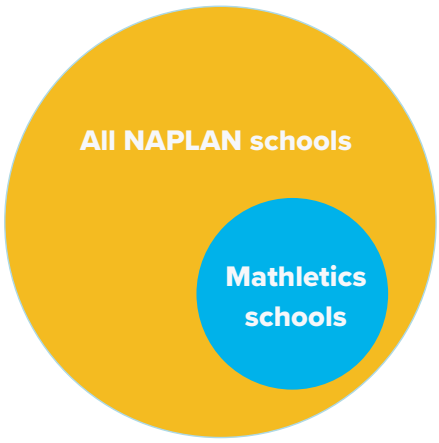
This study examines whether schools using Mathletics, particularly through engagement with Skill Quests and Activities, achieve higher NAPLAN numeracy performance compared to schools not using the platform.

Study Design

We obtained 2024 NAPLAN numeracy scores for all year levels in participating schools from the Australian Curriculum, Assessment and Reporting Authority (ACARA). From the ACARA dataset, we are able to identify Mathletics customers and non-customers.

In this study, we define Mathletics customer schools as schools with continuous active access between at least June 2023 to February 2024. This timeframe esures students have sufficient time to benefit from the program.

The following analysis aims to demonstrate that in terms of NAPLAN numeracy test results, schools using Mathletics perform significantly higher than schools not using Mathletics.



Year 3 NAPLAN numeracy test score comparison

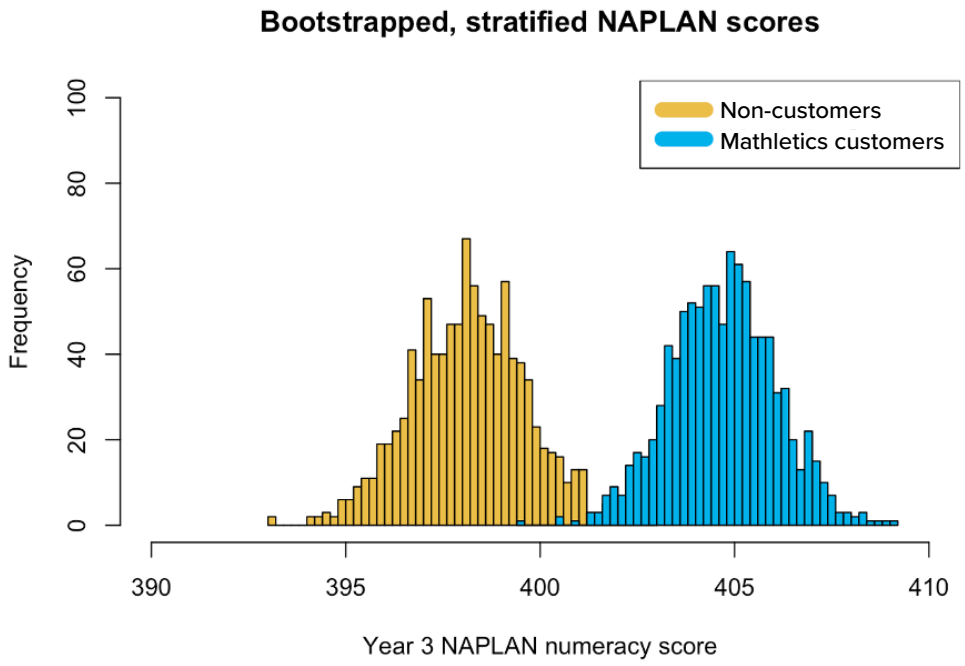
We use a statistical technique called randomised stratified sampling to repeatedly draw samples from the Mathletics customer and non-customer groups. In each sampling run, schools are stratified by sector in the following ratios:

- Government: 70%
- Catholic: 18%
- Independent: 12%.

Criticisms of studies conducted by other supplementary mathematics products include that small sample sizes were handpicked to support their hypotheses. In contrast, by using bootstrapping [i] and stratification [ii] for randomisation, we control for confounding factors and enhance the robustness of our analytical conclusions.

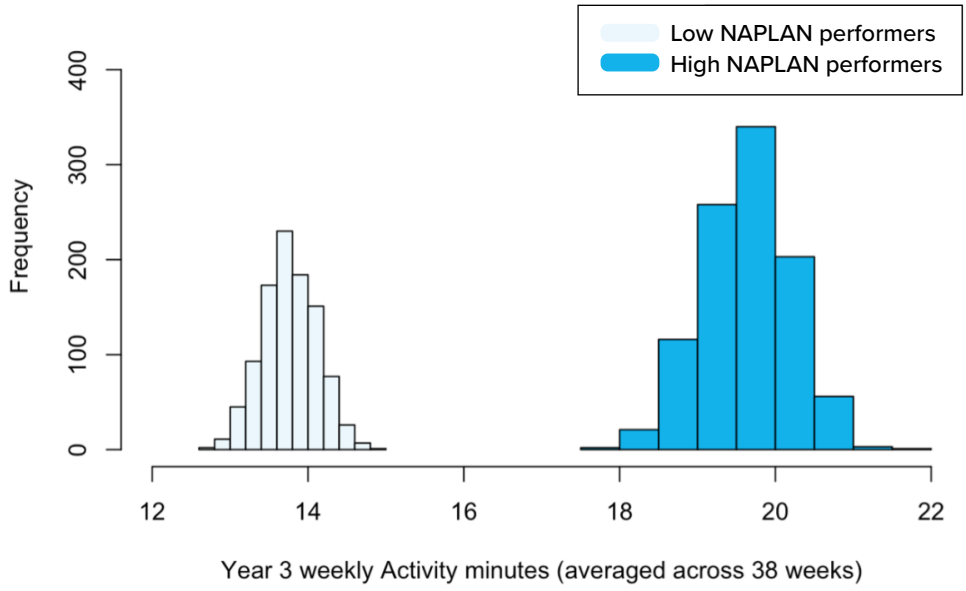
Based on a sample size of 500 each time, repeated 1000 times, we show that Mathletics customers have a higher mean score of 405.40 (std. error 1.36) with a 95% confidence interval of [403.4, 408.8]. This contrasts with non-customers who have a lower mean score of 397.83 (std. error 1.51) with a 95% confidence interval of [394.5, 400.4]. Effect size, as measured by Cohen's d, is large (d = 4.52).

The following plot shows the bootstrapped and stratified NAPLAN score distributions of Mathletics customer schools and non-customer schools. The analysis demonstrates statistically significant differences between the two groups. While individual schools within each group show variation in performance, schools using Mathletics consistently achieve higher average numeracy scores than those not using the platform. This systematic pattern observed across multiple sampling iterations indicates meaningful educational impact.

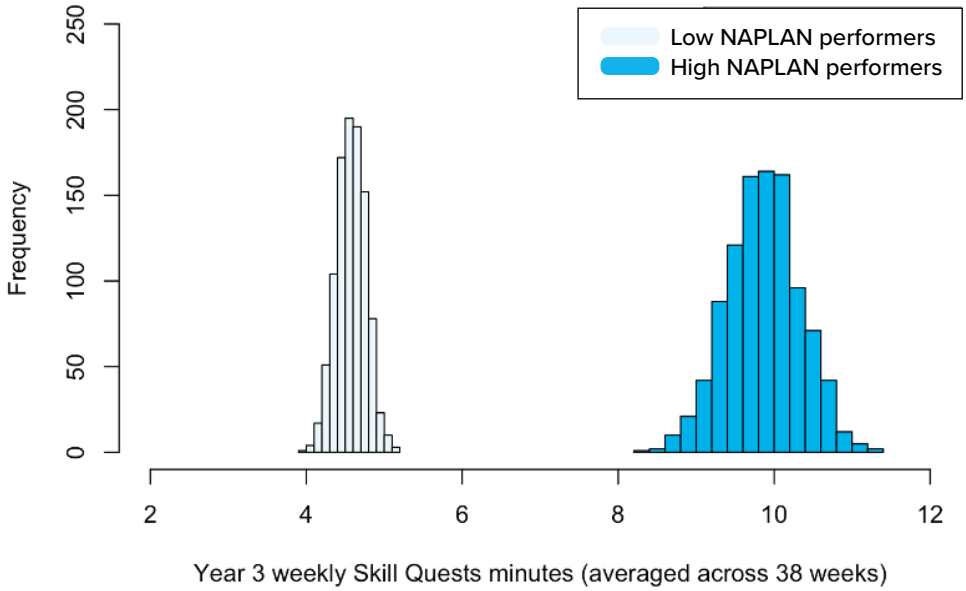


Next, we investigate the relationship between Mathletics usage and NAPLAN scores. We already know Mathletics schools scored higher than non-customer schools, but we want to know how much impact Mathletics is making. To that end, we bifurcate Mathletics customers into high-performer and low-performer groups based on their NAPLAN scores using hierarchical clustering [iii]. Mathletics Activities and Skill Quests usage patterns for these groups are then compared.

Bootstrapped low vs high-performer activity usage



Bootstrapped low vs high-performer skill quests usage



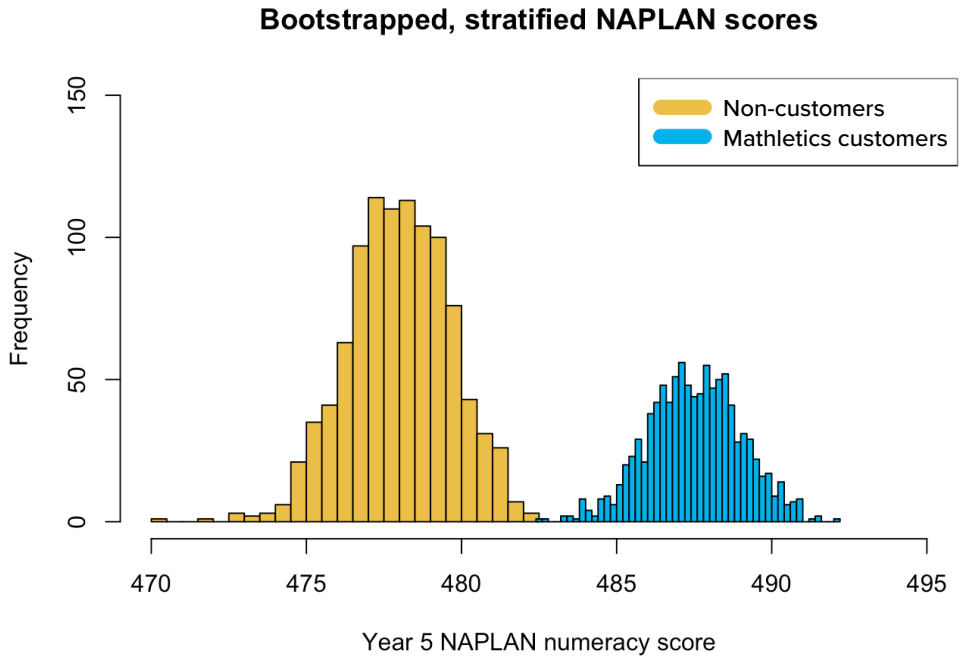
The following table summarises the groups' usage patterns.

Mathletics schools	Activities (minutes)	Skill Quests (minutes)
High NAPLAN performers	[18.51, 20.76]	[8.95, 10.77]
Low NAPLAN performers	[13.06, 14.46]	[4.20, 4.93]

The two plots and summary show that amongst Mathletics customer schools, low usage is correlated to low NAPLAN scores. Conversely, high usage in Mathletics Activities and Skill Quests is correlated with high NAPLAN scores. Using simple linear regression [iv], we estimate that an extra 15 minutes of Mathletics Activities and Skill Quests usage each day over a 7-month period could lift a low performing school's average NAPLAN score by between 47 and 87 points, all else being equal.

Year 5 NAPLAN numeracy test score comparison

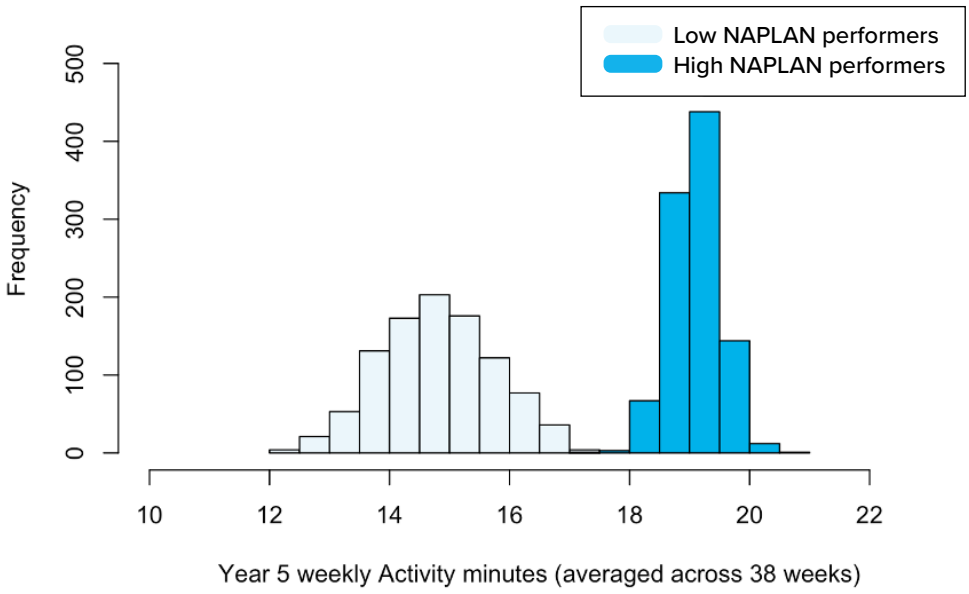
The study on year 5 numeracy scores follows the same method. We present the results below.



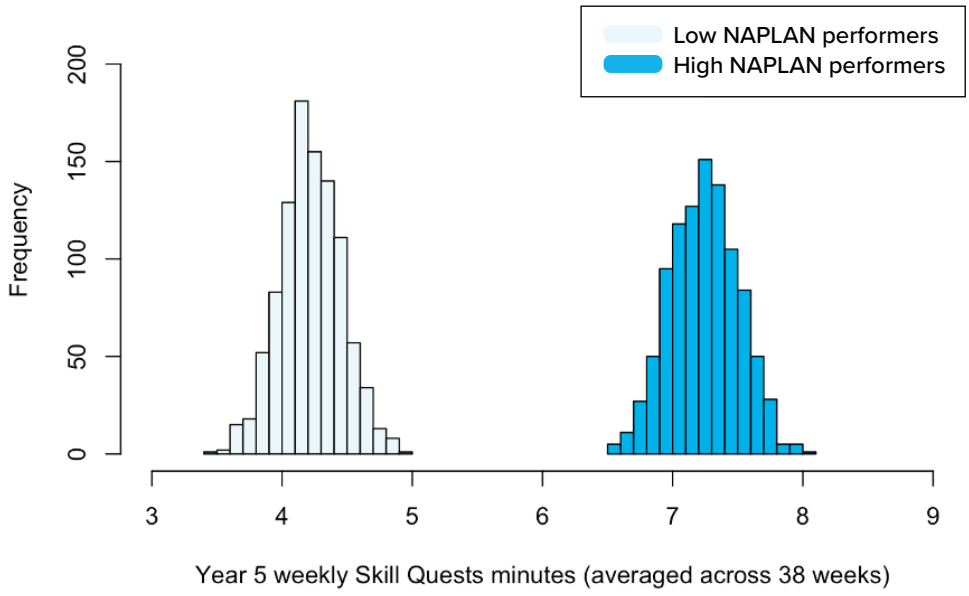
Group	95% CI NAPLAN score (n=500, R=1000)
Mathletics customers	[484.5, 490.4]
Non-customers	[474.7, 481.1]

Effect size as measured by Cohen's d is 5.98.

Bootstrapped low vs high-performer activity usage



Bootstrapped low vs high-performer skill quests usage



Mathletics schools	Activities (minutes)	Skill Quests (minutes)
High NAPLAN performers	[18.20, 19.93]	[6.75, 7.74]
Low NAPLAN performers	[13.00, 16.63]	[3.74, 4.69]

Based on year 5 customer data, the fitted simple linear regression model estimates that an extra 15 minutes of Mathletics Activities and Skill Quests usage each day over a 7-month period could lift a low-performing school's average NAPLAN score by between 19 and 89 points, all else being equal.

Conclusion

This analysis clearly shows that even minimal use of Mathletics delivers a measurable impact. Schools using Mathletics outperformed non-users in the 2024 NAPLAN numeracy results for both Year 3 and Year 5, a statistically significant finding. Furthermore, we identified a positive exposure-response relationship: the more students engaged with the platform, the greater the academic gains observed.

We performed these analyses using advanced statistical techniques to avoid small, hand-picked samples and biases inherent in convenience sampling approaches.

This study uses only Mathletics usage and 2024 NAPLAN data from ACARA; therefore, it is not possible to compare the same school to itself before and after Mathletics use. We aim to perform future studies using paired comparison methodology to address this limitation and strengthen causal inference.

The findings support the integration of systematic digital mathematics instruction within comprehensive educational programs, particularly when implementation includes adequate usage intensity and engagement with evidence-based platform components designed to develop both conceptual understanding and procedural fluency.

References:

Efron, B., & Tibshirani, R. J. (1994). *An Introduction to the Bootstrap*. Chapman and Hall/CRC.

Cochran, W. G. (1991). *Sampling Techniques* (3rd ed.). John Wiley & Sons.

Everitt, B. S., Landau, S., Leese, M., & Stahl, D. (2011). *Cluster Analysis* (5th ed.). John Wiley & Sons.

Montgomery, D. C., Peck, E. A., & Vining, G. G. (2021). *Introduction to Linear Regression Analysis* (5th ed.). John Wiley & Sons.