Impact Report: Renaissance Star Reading and Renaissance Accelerated Reader

Findings from an independent study by Professor Keith Topping on 'Implementation Fidelity and Pupil Achievement in Book Reading'

Accelerated Reader study by the numbers:

- 852,295 students tested
- UK-wide
- 3,243 schools involved
Implementation fidelity or integrity is a key variable in evidence-based interventions, but is rarely assessed over a long period. In his 2016 study, Professor Keith Topping sought to answer the following questions:

1. Do schools in which Renaissance Accelerated Reader is implemented well show higher gain on the Renaissance Star Reading test than schools in which it is not implemented well?
2. Does a theoretical model or an empirical model of the relationship between implementation integrity and outcomes show the strongest influence on outcomes?

Achievement was indicated by key pre-post measures on Renaissance Star Reading, a computerised item-banked adaptive test of reading accuracy and comprehension. Implementation fidelity was indicated by key variables from the computerised Renaissance Accelerated Reader software, which measures understanding of a real book the student has chosen by a quiz.

In theoretical terms, high implementation integrity is specified by high Average Percent Correct on the quizzes and high Amount of Time Devoted to Silent Reading (also referred to as engaged reading time in the class). In empirical terms, a number of AR variables were investigated, and the most predictive found to be Average Percent Correct and Average Book Level minus Mid Grade/Year Placement (the latter was a derived variable intended to indicate the degree of challenge in the books each student was reading in relation to their chronological age).

1 Topping, K. (2016). Theoretical and Empirical Indicators of Implementation Integrity in Book Reading.
Results: Overall, the research found a clear positive relationship between Best Practice use of AR and SGP performance

Renaissance recommend that Renaissance Accelerated Reader (AR) is implemented with Average Percent Correct above 85% for each student and with time devoted to silent reading within the school class day. For the purposes of this study, the author categorised AR use utilising Average Percent Correct (APC) and Amount of Time Devoted to Silent Reading (ATDSR) into:

1. No AR use
2. Low AR use (below 85% APC or less than 15 min/day ATDSR)
3. Moderate AR use (85% APC or higher and 15-29 min/day ATDSR)
4. Best Practice AR use (85% APC or higher and 30+ min/day ATDSR).

These categories were then related to median Student Growth Percentile (SGP) scores from Star Reading. Student Growth Percentile (SGP) is taken from the SS (Scaled Score) scores on two or more Star Reading tests within 18 months to give an indication of the student’s growth trajectory. It ranges from 1 to 99 and indicates how exemplary a student’s growth from one test window to another is relative to students in the same Year with a similar achievement history across the country. SGPs have a national median of 50. An SGP of 10, for example, would indicate growth of that student which exceeded 10 percent of their academic peer’s growth and was less than 90 percent of their academic peers, i.e. relatively low. Conversely, an SGP of 90 would indicate growth exceeding 90 percent of their academic peers. SGP percentiles are robust to outliers and uncorrelated with prior achievement. The SGP score indicates past growth trajectory and thus predicts future growth trajectory (Betebenner, 2011).

The study found a clear positive relationship between AR implementation categories and SGP overall (Figure 1).

**Figure 1: AR implementation categories and SGP overall**

---

The study found essentially the same pattern between Primary and Secondary, but the results were more elevated at Primary (Figure 2).

**Figure 2: AR implementation categories and SGP for primary and secondary**

![Bar chart showing AR implementation categories and SGP for Primary and Secondary](chart1.png)

**AR implementation categories and SGP for Struggling Readers**

The same pattern was found for struggling readers.

**Figure 3: AR implementation categories and SGP for struggling readers**

![Bar chart showing AR implementation categories and SGP for Struggling Readers](chart2.png)
AR implementation categories and SGP for Free School Meal students

Students in receipt of free school meals (a measure of low socio-economic status) also showed the same pattern.

Figure 4: AR implementation categories and SGP for free school meal students

AR implementation categories and SGP for EAL students

The pattern was also the same for students learning English as a second or additional language.

Figure 5: AR implementation categories and SGP for EAL students
About the analysis

To explore how Renaissance Accelerated Reader (AR) relates to growth in general reading ability, Professor Topping analysed (AR) and Star Reading data from the 2014-15 school year. The sample consisted of students who both used AR and completed Star Reading pre- and posttests. The final data set included information for over 852,000 students in Years 1 to 13, and was divided into four groups:

- Typical students: did not use AR
- Students with a Low AR use: had below 85% average percent correct on AR Quizzes and less than 15 minutes of engaged reading time per day.
- Students with a Moderate AR use: had 85% or higher average percent correct on AR Quizzes (the target comprehension range) and 15-29 minutes of engaged reading time.
- Students with Best Practice AR use: utilised AR according to research-based recommendations – 85% or higher average percent correct on quizzes and at least 30 minutes of engaged reading time.

Individualised practice with Renaissance Accelerated Reader

Accelerated Reader software provides teachers with a comprehensive programme to motivate, monitor and manage student reading practice. Research-based guidelines, target-setting features and tools for matching children of all ages and abilities with appropriate texts promotes individualised reading practice that is shown to optimise academic growth.

AR Quizzes are available for more than 29,000 books, including both fiction and non-fiction titles. Available books can be found by teachers, librarians and parents using AR BookFinder (www.arbookfind.co.uk) or by students using the Discovery Bookshelf feature of AR, which displays titles that may be a good fit for each child based on previous reading history, reading level and popularity.

Research base: AR stands out

Accelerated Reader is one of the most heavily researched educational programmes in the world. Currently, the global research base supporting AR as highly cost-effective comprises over 176 studies, of which there are:

- More than 30 experimental or quasi-experimental studies (generally considered the strongest designs)
- Over 27 studies published in peer-reviewed journals
- 150+ studies led independently

The following are examples of independently conducted, peer-reviewed experimental studies of Accelerated Reader:

- Shannon, Styers, Wilkerson and Peery (2005) found that urban students in classes assigned to use Accelerated Reader experienced significantly higher gains compared to non-AR students.
- Nunnery and Ross (2007) found higher test scores for students in Texas could be attributed to Accelerated Reader, and better AR implementation led to larger gains.
- Topping and Sanders (2000) found that for Tennessee teachers using Accelerated Reader, a higher volume of reading practice yielded higher test scores for students.
Independent technical reviews

In addition to its large body of research support, AR has received favourable reviews from notable independent organisations:

• Education Endowment Foundation (EEF): Accelerated Reader increased the reading age of pupils by three additional months in just 22 weeks. The effect on low-income pupils was even greater, with their reading ages improving by five additional months in the same amount of time. [Link](https://www.educationendowmentfoundation.org.uk/evaluation/projects/accelerated-reader)

• National Literacy Trust (NLT): Cross-sectional and longitudinal data sets unanimously show that more pupils who use Accelerated Reader (AR) enjoy reading, read more frequently and think more positively about reading than their peers who do not use AR. [Link](https://www.literacytrust.org.uk/assets/0003/2809/AR_2016_-_Final.pdf)

Conclusion

As this study shows, students using Accelerated Reader in schools following recommended Best Practices grew significantly more than those not using the software. These results held true for both Primary and Secondary students across the UK, and populations of interest (struggling readers, English language learners and students in receipt of free school meals) and rose with the level of programme use.

Thus in relation to the research questions, the study found that schools in which Accelerated Reader was implemented well showed higher gain on the Star Reading test than schools in which it was not implemented well. It also found that an empirical model of the relationship between implementation integrity and outcomes showed a stronger influence on outcomes than a theoretical model.