

Research in Brief:

Academic Interventions for Elementary and Middle School Students with Low SES

Research consistently finds that students with low socioeconomic status (SES) underachieve on standardized tests compared to high SES students. This is attributed to a host of inequalities and challenges that low SES students face such as family income, neighbourhood, and nutrition, among many others. Academic interventions provide a means to help low SES students realize their full academic potential by compensating for these factors that constrain them.

A recent systematic review examined the current literature to better understand what types of interventions can be implemented to increase standardized test scores in reading and mathematics of low SES students in elementary and middle school.

What is a systematic review?

The purpose of a systematic review is to sum up the best available research on a specific question. This is done by bringing together the results of several studies. Studies included are screened for quality, so that the findings of a large number of studies can be combined.

What is a meta-analysis?

A meta-analysis is a statistical analysis that summarizes the quantitative results of several studies. The purpose of a meta-analysis is to develop a single conclusion that has greater statistical power than any single study.

What did the researchers do?

The researchers searched for articles on several bibliographic databases (e.g. Campbell Library, Cochrane Library, PsycINFO) using four categories of keywords: students, socioeconomic status, outcomes, and study design. For each category, they included a large number of synonyms. They also searched through the latest journal publications for articles that may not yet have been included in the databases.

The researchers then screened the titles and abstracts of studies for their suitability based on the following criteria: interventions aimed to improve educational achievement, interventions could be implemented by schools or local stakeholders, interventions are aimed at low SES students, examine students in elementary or middle school, use standardized academic tests to assess effects of interventions, employ a treatment-control group study design, did not implement a bundle of best practices in low performing schools, did not study special schools (e.g. charter schools), did not implement whole-school reform strategy concepts, intervention was carried out in the OECD or EU countries, full-text written in English, German, Danish, Norwegian, or Swedish, and interventions were performed in or after the year 2000.

Why does this matter?

- ⇒ Low SES students enter school with fewer cognitive and social skills that are closely tied to educational achievement.
- ⇒ Low SES students are academically underperforming compared to high SES students
- ⇒ There is a greater need for schools to address the achievement differences between high and low SES students.
- ⇒ Interventions helps low SES students develop the tools needed to flourish academically.

The Knowledge Network for Student Well-Being is a project of the **Knowledge Network for Applied Educational Research** (www.knaer-recrae.ca)

Communities of practice in the KNSWB include: **Ontario Healthy Schools Coalition, PREVNet, School Mental Health ASSIST, and the Social Planning Network of Ontario**

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After reviewing the titles and abstracts of 11,807 studies, the researchers obtained and reviewed full-text versions of 1,137 potentially relevant studies. Overall, 101 studies met the inclusion criteria and were included in the meta-analysis.

The researchers then extracted the data describing the instructional methods of the interventions and coded whether the intervention contained one or more of the following components:

- After school programs: interventions implemented in an after-school setting.
- Coaching/mentoring of students.
- Coaching/mentoring of personnel: interventions that provided teachers or other school personnel with coaches or mentors.
- Computer-assisted instruction: interventions that used computers and software programs to enhance student achievement.
- Content changes: interventions that changed the content that is taught.
- Cooperative learning: interventions where students worked in pairs or small groups in a systematic and structured manner.
- Feedback and progress monitoring: interventions that added a specific feedback or progress monitoring component where teachers or students received detailed information about the students' development.
- Incentives: interventions that used incentives to increase the academic performance of students, incentives did not to be monetary.
- Increased resources: interventions that increased resources without entailing a specific change to the pedagogical contents or methods.
- Personnel development: interventions where school personnel, mainly teachers or principals, received training for further education.
- Psychological/behavioural interventions: interventions focused on improving educational achievement through improving social-cognitive skills, mitigating problematic behaviour and changing expectations or beliefs.
- Small-group instruction: interventions that included instruction where students are placed in groups smaller than regular class sizes.
- Summer programs: interventions administered during a summer break.
- Tutoring: interventions where students got supplemental pedagogical support from an instructor, either one-on-one or in a small group, tutors could be volunteers, paid non-teachers, or professional teachers.

Once the data was coded, the researchers statistically evaluated how effective the intervention components were at improving academic outcomes.

What did they learn?

Academic interventions improve the reading and mathematical achievement of low SES students in elementary and middle school. But, there is substantial variation in efficacy depending on the intervention components.

In order of their effectiveness, tutoring, feedback and progress monitoring, and cooperative learning components were most beneficial for students' test scores. This is both because students increased test scores the most and the statistical findings were most resistant to errors when the assumptions of the statistical test were only approximately met.

Interventions that employed small-size group instruction, coaching/mentoring of school personnel, content changes and increased resources support components also improved students' test performance. However, these components are slightly less valuable because the statistical findings are less resistant to errors when the assumptions of the statistical test were only approximately met.

Incentive programs, after school programs, summer programs, coaching/mentoring students, psychological/behavioural interventions, personnel development and computer assisted instruction programs did not influence students' test scores. However there are examples of effective interventions in these categories so these results do not imply that these programs cannot be effective.

The results of this review suggest that academic interventions have the potential to propel the educational achievement of low SES students. Implementing academic interventions that have been shown to be effective for low SES students in elementary and middle school should be a priority for policymakers and educators.

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