Education Development Trust

A global evidence review for policymakers: findings from meta-analyses of tutoring

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The COVID-19 pandemic has had an unprecedented impact on education systems worldwide, with widespread school closures and a rapid shift to remote learning. In response to the pandemic, more than 190 countries implemented nationwide school closures, disrupting the education of approximately 1.5 billion students.[3] While these closures were necessary to slow the spread of the virus, they have also led to significant learning loss, exacerbating existing educational inequalities and disproportionately affecting disadvantaged students.[4] A recent systematic review and meta-analysis of the evidence of learning during the COVID-19 pandemic found a substantial overall learning deficit with an effect size (ES) of −0.14. This arose early in the pandemic and has persisted over time.[5] The study found learning deficits were particularly large among children from low socio-economic status, were larger in mathematics than in reading, and larger in middle-income countries relative to high-income countries. The study identifies an evidence gap on learning progress during the pandemic in low-income countries.

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Governments and educational institutions worldwide have recognised the urgent need for targeted interventions to mitigate learning loss and help students catch up. One such intervention that has gained prominence during the pandemic is tutoring. Tutoring, which involves one-on-one or small-group instruction from a teacher or teaching assistant, targeted at subject-specific areas, has been widely acknowledged as an effective means of addressing learning gaps, particularly for disadvantaged students.[6]

Governments around the world have begun to invest in large-scale tutoring initiatives as a key component of their pandemic recovery efforts. For example, the United Kingdom has launched the National Tutoring Programme, which aims to provide targeted, high-quality tutoring to disadvantaged students in England.[7] Similarly, the United States has allocated funding for evidence-based tutoring programmes through the American Rescue Plan.[8]

Given the widespread adoption of tutoring as an academic catch-up intervention in response to the pandemic, it is essential to summarise the existing evidence on the effectiveness of different tutoring approaches and identify the factors that contribute to successful implementation. This working paper aims to provide a comprehensive synthesis of meta-analyses on the effectiveness of tutoring programmes involving one-to-one and small-group tuition. By examining the existing literature and identifying key findings, this paper will offer valuable insights for policymakers, educators, and researchers seeking to design and implement effective tutoring programmes.

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[3] UNESCO (2023)
[4] Azevedo et al. (2021)
[5] Betthäuser, Bach-Mortensen and Engzell (2023)
[6] EEF (2023)
[7] Department for Education (2023)
[8] United States Department of Education (2022)

Definitions

A tutor is defined as 'a teacher who teaches a child outside of school, especially in order to give the child extra help with a subject he or she finds difficult'.[9]

For the scope of this working paper, we have narrowed the focus of tutoring to one-to-one and small-group tutoring. These are defined as follows:

» One-to-one tuition involves a teacher, teaching assistant or other adult giving a pupil intensive individual support. It may happen outside of normal lessons as additional teaching or as a replacement for other lessons.[10]

» Small-group tuition is defined as one teacher, trained teaching assistant or tutor working with two-to-five pupils together in a group. This arrangement enables the teaching to focus exclusively on a small number of learners, usually in a separate classroom or working area.[11]

Tutoring is a personalised educational support strategy, where a tutor, who possesses expertise in a specific subject, provides tailored one-on-one or small-group instruction to students. This approach aims to enhance students' understanding of the subject matter, fill knowledge gaps, and improve their academic performance. Unlike mentoring, which focuses on fostering personal and professional growth through guidance from a mentor, or remedial catch-up strategies that target students struggling to meet expected academic milestones, tutoring emphasises the individual's specific learning needs.

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While each of these strategies shares a common goal of supporting student success, tutoring is distinguished by its targeted and customised approach to learning. Other approaches have been successfully used to support learning loss recovery. For a review of global research in these areas, definitions, and examples of these other types of support, see the EDT report *Learning loss, learning gains and wellbeing: A review of policy and grey literature.*[12]

Our Approach

The rationale for the search strategy and inclusion criteria is to identify meta-analyses which contain an estimate of the impact of tutoring by adults on academic outcomes for children and young people of school age. It focuses on typical school-age populations and typical settings where tutoring takes place and where findings are likely to be most informative for policy and practice.

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9   Cambridge Dictionary (no date)
10 EEF (2021a)
11 EEF (2021b)
12 Ndaruhutse et al. (2021)

Included	Excluded
Meta-analyses or quantitative syntheses published in, or after, the year 2000.	Narrative reviews, systematic reviews without a quantitative synthesis, single studies; studies published before 2000.
Studies in which the majority of the review's population comprises children and young people of primary or secondary school age (4–18).	Nursery or pre-school children; second/additional language learners; children or young people with specific learning needs (such as physical, emotional or cognitive disabilities); adult learners; higher education students.
Studies which report the impact of tutoring interventions and approaches (one-to-one or small group) delivered by an adult (such as a teacher, teaching assistant or volunteer).	Studies of tutoring by peers; instruction to group size of six or greater.
Studies offering a comparison with an appropriate counterfactual group (such as a randomised controlled trial or a quasi-experimental study).	Single group designs, single case comparisons.
Studies reporting learning outcomes (such as standardised tests, curriculum assessments, or examinations).	Studies of attitudinal or motivational measures; cognitive process measures (e.g. working memory).
Studies in settings typical for educational tutoring (such as schools, community settings, private tutoring, or at home).	Reviews only of laboratory studies or of theoretical perspectives.

In order to identify as full a population of eligible studies as is feasible, we searched several databases using an initial scoping stage (Google Scholar), followed by a systematic search of academic databases and gateways,[13] and finally a targeted search of databases and organisational websites containing professional reports and other forms of grey literature on tutoring.[14]

The search involved screening the titles of articles using a range of search terms such as 'tutoring' and 'meta-analysis'. Each meta-analysis was coded for the main characteristics of tutoring involved in the study together with a summary of the effects reported.

The search returned 25 meta-analyses (see Appendix), with five excluded due to methodological concerns and 19 included in the meta-synthesis.[15] Across the included meta-analyses, over 1,173 study citations are referenced, making this arguably one of the most researched areas in the history of education.

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[13] Academic databases searched included ERIC, First Search, British Education Index and Web of Science
[14] Targeted search of grey literature included American Institutes for Research, JPAL, NBER, Cochrane Library, NTP, Ofsted, EEF

[15] A full Technical Appendix is available on request from Education Development Trust

Summary of meta-analyses

The table summarises the meta-analyses included in the global review of tutoring evidence, with the type of tutoring, main effect size and conversion to months' progress. This conversion follows the approach adopted by the EEF,[16] and is based on the assumption that pupils make approximately one standard deviation of progress on standardised tests over the course of an academic year. The types of tutoring include one-to-one (1:1), small-group tutoring (SGT), Intelligent Tutoring Systems (ITS) and private tutoring.

Type of tutoring	Range of indicative effect sizes	Range of months' progress	Average months' progress
1:1	0.07 to 0.59	+1 to +9	+5
SGT	0.28 to 0.37	+4 to +5	+4
ITS	0.09 to 0.42	+2 to +5	+3
Private tutoring	0.42	+5	–

The appendix provides more information on the meta-analyses included in the review. Across the 22 meta-analytical syntheses included in this review, the indicated effect sizes ranged from 0.09 to 0.70 (one to nine months' progress).

The evidence identified in this review uses meta-analyses which typically exclude papers in languages other than English, and tends to focus on high-income countries. Some caution may be needed when applying the findings to other settings.

Key Findings

Evidence shows one-to-one tuition is effective at improving pupil outcomes, with an average of +5 months' progress (effect size (ES) +0.42),[17] and has a slightly higher impact than small-group tuition, with an average of +4 months' progress (ES +0.34).

Tutoring is more likely to make an impact if it is in addition to and explicitly linked with normal lessons.[18 19]

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One-to-one tuition is more expensive if the tutoring is delivered by qualified teachers. Evidence shows a greater impact for qualified teachers, although impacts from volunteer tutors and teaching assistants are positive when they are well trained and supported.[20]

Small-group tuition is an effective approach to improving pupil outcomes with group sizes of two-to-five learners.[21] This approach may be cost-effective for schools to consider as a targeted academic intervention.

Evidence shows that intensive blocks of tutoring are usually more effective, with smaller impacts for programmes greater than 20 weeks.[22] Furthermore, tutoring blocks will have more impact if they deliver 12 or more hours of tutoring.[23]

The evidence for Intelligent Tutoring Systems (ITS) using digital technologies is weaker, showing on average a lower impact of +3 months' progress (ES +0.20) compared to one-to-one and small-group tuition.

The evidence for the impact of private tutors is limited, with only one meta-analysis including 22 individual studies, demonstrating an average impact of +5 months' progress (ES +0.42).[24]

[16] EEF (2022)
[17] The average effect size is calculated using the mean or median and then converted to months' progress using the EEF Additional Months' Progress impact measure
[18] EEF (2021a)
[19] A recent study by Education Development Trust, published in the Chartered College of Teaching journal *Impact*, illustrates an approach to this from a school in England (Fairfield and Fox, 2023)
[20] Elbaum et al. (2000)
[21] EEF (2021b) and Jitendra et al. (2021)
[22] Steenbergen-Hu and Cooper (2013)
[23] Jitendra et al. (2018)
[24] Zhang and Liu (2022)

Conclusions

We suggest that small-group tutoring may be a more affordable tutoring model for schools, using group sizes of three pupils to maximise the potential impact of the intervention. The approach is more likely to be beneficial if it is additional to and explicitly linked to normal lessons.

One-to-one tutoring is a more expensive tutoring approach, and therefore using this as a highly targeted intervention for students who require intensive support to supplement small-group tutoring interventions may provide a more sustainable tutoring model.

The evidence for using Intelligent Tutoring Systems is less secure. The recent advancements in Artificial Intelligence (AI) and associated technology in the last few years could make this approach more affordable in the near future. Consequently, if this approach is employed, it should be ensured that robust monitoring systems are in place to monitor progress and evaluate impact.

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Limitations and recommendations for future research

The current meta-synthesis focused primarily on one-to-one and small-group tutoring, with intelligent tutoring systems overlapping these approaches. Alternative tutoring approaches such as peer tutoring were excluded from the review. Peer tutoring is a high-impact, low-cost intervention based on extensive research evidence[25] and may provide a sustainable tutoring model in schools.

Most of the research relates to primary schools, and in particular to reading. A limitation within the research is the lack of studies on the impact of tutoring for subjects outside the context of literacy or mathematics, as well as at secondary level. Future research opportunities exist to strengthen the evidence base for a broader range of curriculum subjects, especially for older pupils.

Recent advances in AI could potentially provide a more affordable tutoring model for schools. Relevant examples include the incorporation of ChatGPT by Khan Academy; however, the evidence for the impact of this technology is based on very limited research. Ensuring that robust evaluations of new applications of AI in education are completed will help inform policymakers and school leaders of the potential impact. An evidence gap for low-income countries is evident in the meta-analyses which identify the countries of the original studies, with mainly high-income and English-speaking countries contributing to the evidence for the impact of tutoring. Indeed, information about geography was limited in many of the studies included in this review. Where geographic information was included, the studies typically related to high-income countries. There is a need for more data and research on tutoring in lower-middle- and lower-income countries, and for studies to be explicit on what geographies are included in the reviews covered.

Implications for policy and practice

Implementing small-group tutoring will help to reduce the cost of the intervention, with a group size of three as optimal for maintaining high impacts. Increasing the group size above six will likely result in reduced effectiveness.

Regularly evaluating impact is important: using diagnostic assessment to assess the best way to target support, and tracking pupil progress with internal school assessment data will allow impact to be measured. In a review of tutoring in schools, Ofsted found that schools generally had not yet developed efficient means to assess pupils' progress from the tutoring sessions.[26]

If volunteers, teaching assistants or external tutors are used, training should be provided and the focus of the tutoring aligned with the curriculum. Regular lines of communication between tutors and classroom teachers will help to maximise the impact of tutoring.[27]

Attendance at and completion of the scheduled tutoring should be carefully considered. In the Year 1 evaluation of the National Tutoring Programme in the UK, 232,892 unique pupils were enrolled on the programme. Just over half (56%) of pupils attended 12 or more hours of tutoring, and 35% of pupils did not receive the amount of tutoring felt to be beneficial for learning according to the programme assumptions.[28] If one-to-one tutoring is adopted, pupil absence will still incur the costs of the tutor, so deploying small-group tuition should make this a more sustainable model.

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26 Ofsted (2022)
27 ImpactEd (2022)
28 National Foundation for Educational Research (2022)

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Appendix

The table summarises the meta-analyses included in the review of tutoring evidence, with the type of tutoring, main effect size and conversion to months' progress. This conversion follows the approach adopted by the EEF,[29] and is based on the assumption that pupils make approximately one standard deviation of progress on standardised tests over the course of an academic year. The types of tutoring include one-to-one (1:1), small-group tutoring (SGT), Intelligent Tutoring Systems (ITS) and private tutoring.

Citation	Type of tutoring	Indicative effect size	Months' progress	Number of study citations in the review
D'Agostino and Harmey (2016)	1:1	0.59	+ 7	16
D'Agostino and Murphy (2004)	1:1	0.38	+5	36
EEF (2021a)	1:1	0.40	+5	126
EEF (2021b)	SGT	0.28	+4	52
Ehri et al. (2001)	1:1	0.57	+7	38
Ehri et al. (2001)	SGT	0.43	+5	29
Elbaum et al. (2000)	1:1	0.41	+5	26
Hall and Burns (2018)	SGT	0.54	+7	39
Jitendra et al. (2021)	1:1	0.07	+1	19
Jitendra et al. (2021)	SGT	0.29	+4	12
Jitendra et al. (2018)	SGT	0.37	+5	122
Jun et al. (2010)	1:1	0.7	+9	107
Jun et al. (2010)	ITS	0.19	+3	65
Lou et al. (2001)	ITS	0.15	+2	4
Ma et al. (2014)	ITS	0.42	+5	21
Neitzel et al. (2022)	1:1	0.41	+5	97
Neitzel et al. (2022)	SGT	0.21	+3	26
Nilvius et al. (2021)	SGT	0.31	+4	19
Ritter et al. (2009)	1:1	0.23	+3	22
Slavin et al. (2011)	1:1	0.39	+5	16
Slavin et al. (2011)	SGT	0.31	+5	36
Slavin et al. (2011)	ITS	0.09	+1	126
Steenbergen-Hu and Cooper (2013)	ITS	0.09	+1	52
Xu et al. (2019)	ITS	0.26	+3	38
Zhang and Liu (2022)	Private Tutoring	0.42	+5	29
				1,173

[25] EEF (2023)