

## Full references

- Attfield., R. (2009). Developing a Gifted and Talented Strategy: Lessons from the UK experience Reading: CfBT.
- Boaler, J. (2008). Promoting 'relational equity' and high mathematics achievement through an innovative mixed-ability approach. *British Educational Research Journal* 34.2 pp 167-194.
- Collins, C. A., & Gan, L. (2013). Does Sorting Students Improve Scores? An Analysis of Class Composition (No. w18848). Cambridge, MA: National Bureau of Economic Research. <http://www.nber.org/papers/w18848>.
- Dunne, M., Humphreys, S., Dyson, A., Sebba, J., Gallannaugh, F., & Muijs, D. (2011). The teaching and learning of pupils in low-attainment sets. *Curriculum Journal*, 22(4), 485-513.
- Duflo, E., Dupas, P., Kremer, M. (2011). "Peer Effects, Teacher Incentives, and the Impact of Tracking: Evidence from a Randomized Evaluation in Kenya". *American Economic Review* 101 (5): pp 1739-1774.
- Hallam, S., & Ireson, J. (2007). Secondary school pupils' satisfaction with their ability grouping placements. *British Educational Research Journal*, 33(1), 27-45.
- Hanushek, E. A. & Woessmann, L. (2005) Does educational tracking affect performance and inequality? Differences-in-differences evidence across countries, CESifo working papers, No. 1415, <http://hdl.handle.net/10419/18779>.
- Ireson, J., Hallam, S. & Plewis, I. (2001). Ability grouping in secondary schools: Effects on pupils' self-concepts *British Journal of Educational Psychology* 71. 2, pp 315-326.
- Ireson, J., Hallam, S., Mortimore, P., Hack, S., Clark, H. & Plewis, I. (1999). Ability grouping in the secondary school: the effects on academic achievement and pupils' self-esteem Paper presented at the *British Educational Research Association Annual Conference*, University of Sussex at Brighton, September 2-5 1999.
- Kulik C-L.C & Kulik J.A. (1982). Effects of Ability Grouping on Secondary School Students: A Meta-Analysis of Evaluation Findings, *American Educational Research Journal*, 19 (3), 415-428.
- Kulik C-L.C & Kulik J.A. (1984). Effects of Ability Grouping on Elementary School Pupils: A Meta-Analysis. *Annual Meeting of the American Psychological Association*.
- Kulik, J.A., & Kulik, C.L.C. (1987). Effects of ability grouping on student achievement. *Equity and Excellence in Education*, 23(1-2), 22-30.
- Kulik, J.A. (1992). *An Analysis of the Research on Ability Grouping: Historical and Contemporary Perspectives* The National Research Center On The Gifted And Talented.
- Lou, Y., Abrami, P. C., Spence, J. C., Poulsen, C., Chambers, B., & d'Apollonia, S. (1996). Within-class grouping: A meta-analysis. *Review of Educational Research*, 66(4), 423-458..
- Marks, R (2013) 'The Blue Table Means You Don't Have a Clue': the persistence of fixed-ability thinking and practices in primary mathematics in English schools, *FORUM*, 55(1), 31-44. <http://dx.doi.org/10.2304/forum.2013.55.1.31>

## Summary of effects

Study	Effect size
Gutierrez & Slavin, 1992 (mixed age attainment/non-graded classes)	0.34
Kulik & Kulik 1982 (on secondary pupils)	0.1
Kulik & Kulik, 1984 (on elementary/primary pupils)	0.1
Lou et al., 1996 (on low attainers)	-0.12
Puzio & Colby, 2010	0.22
Slavin, 1990 (on low attainers)	-0.6
<b>Weighted mean effect size</b>	<b>-0.09 (on low attainers)</b>

For more information about the effect sizes in the Toolkit, click [here](#).

Meta-analyses abstracts	
Study	Abstract
Gutierrez & Slavin, 1992	This article reviews research on the effect of ability grouping on the achievement of secondary students. Six randomized experiments, 9 matched experiments and 14 correlational studies compared ability grouping to heterogeneous plans over periods of from one semester to 5 years. Overall, achievement effects were found to be essentially zero at all grade levels although there is much more evidence regarding Grades 7-9 and 10-12. Results were similar for all subjects except social studies, for which there was a trend favouring heterogeneous placement. Results were close to zero for students of all levels of prior performance. This finding contrasts with those of studies comparing the achievement of students in different tracks, which generally find positive effects of ability grouping for high achievers and negative effects for low achievers, and these contrasting findings are reconciled. A nongraded elementary program is one in which children are flexibly grouped according to performance level, not age, and proceed through the elementary school at their own rates. Popular in the 1950s, 1960s, and early 1970s, the nongraded plan is returning today. This article reviews research on the achievement effects of nongraded organization. Results indicated consistent positive achievement effects of simple forms of nongrading generally developed early: cross-grade grouping for one subject (me-dian ES = + .46) and cross-grade grouping for many subjects (median ES = + .34). Forms of nongrading making extensive use of individualization were less consistently successful (median ES = +.02). Studies of Individually Guided Education (IGE), which used nongrading and individualization, also produced inconsistent effects (median ES = + .11). The article concludes that nongraded organization can have a positive impact on student achievement if cross-age grouping is used to allow teachers to provide more direct instruction to students but not if it is used as a framework for individualized instruction.
Sowell, (2012).	This causal-comparative study examined the relationship of school uniforms to attendance, academic achievement, and discipline referral rates, using data collected from two high schools in rural southwest Georgia county school systems, one with a uniforms program and one without a uniforms program. After accounting for race and students with disabilities status, School A (with uniforms) had significantly better attendance and somewhat fewer minor behaviour infractions, but trended lower in standardized math scores and more intermediate and major behavioural infractions than School B (without uniforms). These findings failed to demonstrate an unambiguous advantage of school uniforms, consistent with the mixed results across reports in the published literature. Implications and suggestions for further research are detailed.
Kulik & Kulik, 1982	This article reports results from a meta-analysis of findings from 52 studies of ability grouping carried out in secondary schools. In the typical study the benefits of ability grouping were small but significant on achievement examinations-an average increase of one tenth standard deviations on examination scores, or an increase from the 50th to the 54th percentile for the typical student in a grouped class. The size of achievement effect differed in different types of studies of grouping however. Studies in which high ability students received enriched instruction in honours classes produced especially clear effects, for example, while studies of average and below average students produced near-zero effects. The benefits of grouping were also clear in the area of student attitudes towards the subjects they were studying than did students in ungrouped classes.
Kulik & Kulik, 1984	A meta-analysis of finding from 31 separate studies showed that ability grouping has significant positive effects on the academic performance of elementary school children. The benefits of grouping tended to be small in the typical study of achievement-an increase from the 50th to the 58th percentile for the typical student in a grouped class. One subgroup of studies however produced especially clear effects. In this type of study students of high ability or gifted students were

	<p>put into special classes in which they received enriched instruction. Studies of this type usually reported significant results and usually reported effects on achievement were moderate in size. meta-analysis"&gt;Meta-analysis also showed that ability grouping has trivially small effects on the self-concepts of elementary school pupils.</p>
Kulik & Kulik, 1987	<p>In this article, we analyse results from a wider variety and greater number of studies than were covered in our earlier meta-analyses. Among the major questions that we try to answer are the following: What are the effects of ability grouping in the typical study? Does grouping have different effects on different types of students—e.g., students of high, average, and low aptitude? Do different approaches to grouping produce different outcomes? Why have different meta-analysts reached different conclusions about grouping? The average effect size was 0.15 standard deviations in the elementary studies and 0.07 standard deviations in the secondary school studies. Special within-class grouping programs designed especially for the benefit of talented students raised their achievement scores by 0.62 standard deviations. Special between-class grouping programs for these students raised their scores by 0.33 standard deviations. Separating talented students into homogeneous groups apparently enabled teachers to provide learning opportunities for the students that were unavailable in more heterogeneous groups. Programs that were designed for all students in a grade—not solely for the benefit of talented learners—had significantly lower effects. Comprehensive between-class grouping raised overall achievement levels by only 0.06 standard deviations, a very small amount. Comprehensive within-class grouping raised overall achievement levels by 0.17 standard deviations.</p>
Kulik & Kulik, 1992	<p>Meta-analytic reviews have focused on five distinct instructional programs that separate students by ability: multi-level classes, cross-grade programs, within-class grouping, enriched classes for the gifted and talented and accelerated classes. The review shows that effects are a function of program type. Multilevel classes which entail only minor adjustments of course content for ability groups, usually have little or no effect on student achievement. Programs that entail more substantial adjustment of curriculum to ability such as cross-grade and within-class programs produce clear positive effects. Programs of enrichment and acceleration which usually involve the greatest amount of curricular adjustment have the largest effect on student learning. These results do not support recent claims that no one benefits from grouping or that students in the lower groups are harmed academically and emotionally from grouping.</p>
Lou et.al., 1990	<p>The effects of within-class grouping on student achievement and other outcomes were quantitatively integrated using two sets of study findings. The first set included 145 effect sizes and explored the effects of grouping versus no grouping on several outcomes. Overall, the average achievement effect size was +0.17, favoring small-group learning. The second set included 20 effect sizes which directly compared the achievement effects of homogeneous versus heterogeneous ability grouping. Overall, the results favored homogeneous grouping; the average effect size was +0.12. The variability in both sets of study findings was heterogeneous, and the effects were explored further. To be maximally effective, within-class grouping practices require the adaptation of instruction methods and materials for small-group learning.</p>
Puzio & Colby, 2010	<p>Although some literacy researchers consider grouping students for reading instruction to be a proven educational practice, the support for this belief is lacking from a research synthesis perspective. With this idea in mind, Slavin comments in the middle of his review on the effects of grouping: "there is not enough research on within-class ability grouping in reading to permit any conclusions" (Slavin, 1987, p. 320). Because of this, the question of whether "and" how to group students is often cast and answered ideologically rather than empirically. This review attempts to see if the empirical research available can answer either or both of these</p>

	<p>questions. It will contribute to the literacy field by focusing specifically on reading outcomes for classroom teachers, who instruct a wide variety of students. Informed by previous research on within-class grouping, the following three research questions guide the present study: (1) To what extent does within-class grouping impact student achievement in reading?; (2) For which grade(s) or which students is within-class grouping most or least beneficial?; and (3) Do any moderators, especially those identified by previous research (measurement source, teacher development, and grouping type), help explain this effect?</p>
Rogers, 2007	<p>This article discusses five reconsiderations (lessons) the research on the education of the gifted and talented suggests. Although several of the considerations derive from traditional practice in the field, some reconsideration is warranted because of more currently researched differences in how the gifted learner intellectually functions. It is argued that thinking of the gifted learner as idiosyncratic, not necessarily one of many classified as “the gifted,” requires a reconceptualization of how to appropriately and fully serve this unique learner. The research synthesized here covers the period from 1861 to present and represents the entire body of published research studies and representative literature (theory, program descriptions, and persuasive essays). Implications for service development and implementation are also discussed.</p>
Slavin, 1990	<p>This article reviews research on the effect of ability grouping on the achievement of secondary students. Six randomized experiments, 9 matched experiments and 14 correlational studies compared ability grouping to heterogeneous plans over periods of from one semester to 5 years. Overall, achievement effects were found to be essentially zero at all grade levels although there is much more evidence regarding Grades 7-9 and 10-12. Results were similar for all subjects except social studies, for which there was a trend favouring heterogeneous placement. Results were close to zero for students of all levels of prior performance. This finding contrasts with those of studies comparing the achievement of students in different tracks, which generally find positive effects of ability grouping for high achievers and negative effects for low achievers, and these contrasting findings are reconciled.</p>
Steenbergen-Hu & Moon, 2011	<p>Current empirical research about the effects of acceleration on high-ability learners’ academic achievement and social– emotional development were synthesized using meta-analytic techniques. A total of 38 primary studies conducted between 1984 and 2008 were included. The results were broken down by developmental level (P-12 and postsecondary) and comparison group (whether the accelerants were compared with same-age, older, or mixed-age peers). The findings are consistent with the conclusions from previous meta-analytic studies, suggesting that acceleration had a positive impact on high-ability learners’ academic achievement (<math>g = 0.180</math>, 95% CI = <math>-.072, .431</math>, under a random-effects model). In addition, the social–emotional development effects appeared to be slightly positive (<math>g = 0.076</math>, 95% CI = <math>-.025, .176</math>, under a random effects model), although not as strong as for academic achievement. No strong evidence regarding the moderators of the effects was found.</p>
Vaughn et.al. 1991	<p>The purpose of this research was to evaluate the effectiveness of pull-out programs in gifted education. Nine experimental studies were located that dealt with pull-out programs for gifted students. The variables of self-concept, achievement, critical thinking, and creativity were quantified via meta-analysis. The results indicate that pull-out models in gifted education have significant positive effects for the variables of achievement, critical thinking, and creativity. However, gifted students' self- concepts were not affected by the pull-out programs</p>