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Classroom Interaction and Student Learning: A Narrative Review of Evidence on Dialogic Talk, Questioning, Feedback and Peer Interaction

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Abstract

Classroom interaction is often described as a central mechanism of effective teaching, but the supporting evidence is spread across dialogic-teaching trials, meta-analyses of discussion and cooperative learning, reviews of feedback, and studies of teacher–student relationships. This narrative review draws together twelve peer-reviewed or independently evaluated sources to examine which forms of interaction relate to student learning, by what routes they may operate, and what remains unknown for Indian secondary classrooms. A randomised trial of dialogic teaching (38 intervention and 38 control schools) found small positive attainment effects after 20 weeks (d = 0.09 to 0.15 across three subjects; for all pupils combined, the 95% interval excluded zero only in science). Meta-analyses show that discussion approaches vary widely in their effects, that cooperative learning raises achievement and attitudes, and that teacher–student relationships go together with higher engagement and achievement. A systematic review of 96 feedback studies concluded that tailored, action-oriented feedback benefits achievement and motivation, while a large PISA-based analysis found a modest yet significant link between positive feedback and reading self-efficacy. Across the sources, it is the quality of interaction, not the quantity, that appears to matter. We offer an integrative framework in which teacher talk, feedback, relationships and peer interaction influence engagement and self-efficacy and, through these, achievement and higher-order thinking. Three gaps emerge: few controlled studies in Indian secondary schools, limited evidence on questioning in particular, and little attention to gender and language in participation. Implications for teacher education and for putting the National Education Policy 2020 into practice are discussed.

Keywords: classroom interaction; dialogic teaching; teacher questioning; teacher feedback; student learning; secondary education; narrative review; NEP 2020

1. Introduction

The learning that students achieve depends partly on how teachers and students speak, listen, ask questions and respond to each other. In sociocultural theory, higher mental functions appear first between people and only later become part of the individual's own thinking (Vygotsky, 1978). Classroom studies, however, have repeatedly found that the usual pattern of teaching talk is recitation: the initiation–response–evaluation (IRE) sequence, built around closed questions, recall answers and very little feedback (Alexander, 2018).

India's National Education Policy 2020 (Ministry of Education, 2020) encourages schools to adopt more participatory, student-centred teaching. Recent qualitative findings from four Indian states indicate that teachers' beliefs frequently match this aim, yet pre-service and in-service training stays too theoretical and detached from real classrooms (Brookings Institution, 2026). Teachers

consequently need clear, evidence-based direction on which interaction practices count. The evidence, though, sits within separate research

traditions that seldom engage with one another: dialogic teaching and classroom discussion, questioning, feedback, teacher–student relationships and cooperative learning.

This review integrates these strands around three questions.

1. **RQ1.** Which types of classroom interaction relate to better learning, and how large are the reported effects?
2. **RQ2.** By what mechanisms (engagement, self-efficacy, relationships) do they seem to operate?
3. **RQ3.** What gaps restrict the application of this evidence in Indian secondary classrooms?

The paper offers a structured map of the evidence by type of interaction, an integrative framework connecting interaction with learning outcomes, and a research agenda for classroom studies in India.

2. Method

2.1 Review design

We carried out a narrative (thematic) review. This design fits a body of evidence that combines randomised trials, meta-analyses, systematic reviews and large survey analyses, which cannot be pooled statistically. No pooled estimate is calculated here. Effect sizes are given as published, and because they use different metrics (d, g and r) they are not compared directly with one another.

2.2 Search and selection

Targeted searches were run in October 2026 across publisher, repository and institutional web sources. They combined the terms classroom interaction, classroom dialogue, dialogic teaching, discussion, teacher questioning, teacher feedback, self-efficacy, teacher–student relationship, cooperative learning and peer interaction with secondary school and India. A source was kept if it (a) was a peer-reviewed article or an independently evaluated trial or policy report, (b) studied teacher–student or student–student interaction, and (c) reported learning-related outcomes such as achievement, comprehension, engagement, self-efficacy or motivation. Randomised trials, meta-analyses and systematic reviews took priority. The bibliographic details of each retained source were checked against a publisher, repository or institutional record. Twelve sources met these criteria (Table 1).

2.3 Extraction and synthesis

From each source we recorded the design, the sample or the number of primary studies, the interaction focus and the main finding. The findings were then organised into themes: dialogic talk, discussion and questioning; feedback; relationships and peer interaction; and equity and context.

2.4 Scope

The search was purposive rather than exhaustive, so the review does not claim the coverage of a systematic review. Its conclusions apply only to the evidence examined. Section 5 explains what follows from this choice.

Table 1. Sources included in the review

Source	Type	Evidence base	Interaction focus	Main finding (as reported)
Alexander (2018)	Trial report with video analysis	38 intervention and 38 control schools; Year 5 pupils	Dialogic teaching	By the second phase, intervention teachers asked more open questions and led more discussion than control teachers
Jay et al. (2017)	Independent RCT evaluation	2,492 intervention and 2,466 control pupils randomised; 3,912 analysed	Dialogic teaching	d = 0.15 English, 0.12 science, 0.09 maths (1 to 2 months' progress)

Source	Type	Evidence base	Interaction focus	Main finding (as reported)
Murphy et al. (2009)	Meta-analysis	42 studies	Classroom discussion approaches	Effects differed widely by approach; few approaches improved critical thinking
Howe and Abedin (2013)	Systematic review	Four decades of research	Classroom dialogue	Dialogue quality is related to performance; participation varies with gender, ethnicity and prior attainment
Kyndt et al. (2013)	Meta-analysis	65 articles	Cooperative learning	Positive effects on achievement and attitudes; domain, age and culture moderate the effects
Cornelius-White (2007)	Meta-analysis	119 studies; 355,325 students	Learner-centred teacher–student relationships	Mean r = .31 across outcomes
Roorda et al. (2011)	Meta-analysis	99 studies	Affective teacher–student relationships	Medium to large links with engagement; small to medium links with achievement
Korpershoek et al. (2026)	Meta-analysis	76 controlled interventions (primary schools)	Classroom management, including relationships	g = .23 (.22 with robust variance estimation)
Brandmo and Gamlem (2025)	Systematic review (PRISMA)	96 empirical studies; ages 10 to 16	Teacher feedback	12 of 17 intervention studies reported achievement gains
Wang et al. (2025)	Quasi-experimental analysis of PISA 2018	4,838 US 15-year-olds	Positive teacher feedback	Adjusted difference of 0.07 on a 4-point reading self-efficacy scale
Fryer and Leenknecht (2023)	Theoretical review	Meta-analytic correlates of achievement	Teacher clarity, feedback, self-efficacy	Proposes self-efficacy, read as perceived control, as a mediator
Brookings Institution (2026)	Qualitative comparative case study	Over 70 teachers, teacher educators and policy actors; four Indian states	NEP 2020 in classrooms	Teacher beliefs fit the policy vision; training is too theoretical

3. Findings

3.1 Dialogic teaching and attainment

The most robust causal evidence comes from a cluster-randomised trial of dialogic teaching in England. The programme paired teacher training with mentoring and with video or audio review of teachers' own lessons over 20 weeks. An independent evaluation covered 38 intervention and 38 control schools with Year 5 pupils aged 9 to 10 (Alexander, 2018; Jay et al., 2017). Standardised tests showed small positive effects in all three subjects: d = 0.15 in English, 0.12 in science and 0.09 in mathematics, equivalent to one to two months of additional progress (Figure 1). Across all pupils, only the science interval clearly excluded zero, while English reached p = .05 and mathematics p = .19. For pupils eligible for free school meals the effects were of similar size (d = 0.11 to 0.16), and the mathematics result was statistically significant (Jay et al., 2017).

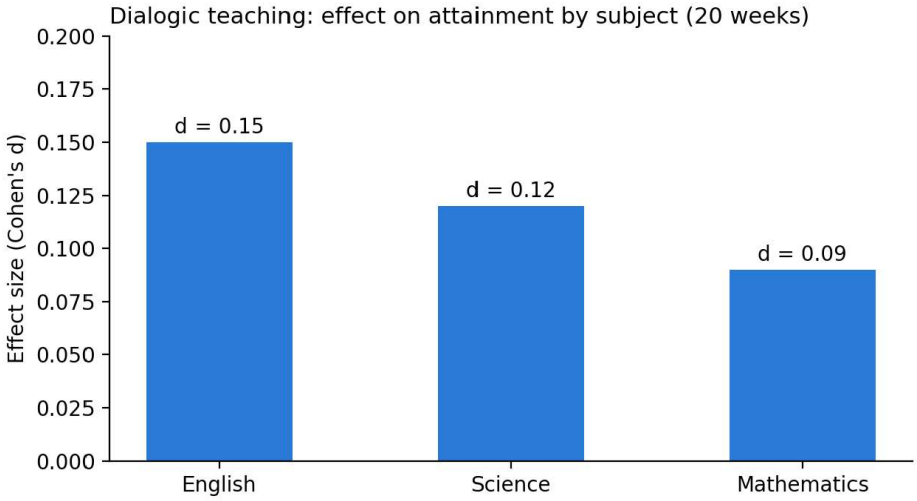


Figure 1. Effect of dialogic teaching on attainment (Cohen's d) by subject. Data from Jay et al. (2017).

Three cautions apply. Seven of the 38 intervention schools did not return post-test data, which leaves roughly one in five pupils out of the analysis, and the trial had no pre-test (Jay et al., 2017; Alexander, 2018). The evaluators described their confidence in

the findings as moderate, and both they and the programme developer consider 20 weeks probably too short, so the effects may be underestimated. Lastly, Alexander's (2018) account was written by the programme's developer and is therefore not independent of the intervention.

Classroom video indicates how the talk changed. Across 134 coded lessons from 15 intervention and 11 control teachers, open and closed questions were evenly balanced at the outset. By the second phase, intervention teachers asked more open questions and made greater use of wait time, revoicing and requests for evidence of reasoning, most clearly in mathematics and science, while pupils gave more extended and fewer brief contributions (Alexander, 2018). The development team carried out this video analysis, and the independent evaluators did not validate it (Jay et al., 2017).

A review of four decades of classroom-dialogue research reports that the quality of dialogue, in both small-group and whole-class settings, is related to academic performance, and that participation differs by gender, ethnicity and prior attainment (Howe & Abedin, 2013).

3.2 Discussion approaches

Murphy et al. (2009) analysed 42 approaches improved comprehension studies of classroom discussion and found uneven effects. Some but few raised critical thinking and reasoning, and most discussions did little to stimulate it. Talk by itself is therefore not the active ingredient. Observation of Grade 8 and 9 literature classes points in the same direction: authentic questions, discussion and group work do not automatically yield learning, and the deciding factor is whether instruction makes students think for themselves instead of repeating another person's thinking (Nystrand et al., 1997, as cited in Alexander, 2018).

3.3 Questioning and the structure of talk

Questioning is the most visible lever that teachers control. In the dialogic trial, teachers were trained to ask open questions, allow pupils time to think, and build on answers through moves such as revoicing, asking for evidence, and inviting agreement or disagreement (Alexander, 2018). The trial cannot isolate the effect of questioning from its other repertoires, and its developer argues that they function as a whole. None of the sources retained here is a controlled study that links question type alone to learning in Indian secondary classrooms. This is the weakest part of the evidence base and is taken up in Section 4.

Observation instruments also limit what can be learned. The classic Flanders system has seven categories for teacher talk but only two for student talk, response and initiation, so student contributions are coded in much less detail than those of teachers (Alexander, 2018). Studies that adapt this system should add finer codes for student talk.

3.4 Feedback

A PRISMA-based review of teacher feedback for ages 10 to 16 searched ERIC, PsycINFO, Educational Research Complete and Scopus, screened 8,593 records and analysed 96 studies (Brandmo & Gamlem, 2025). Of the 17 intervention studies that measured achievement, 12 reported gains, 4 reported no effect and 1 reported a mixed result (Figure 2). The studies with gains emphasised the content of the feedback:

explicit information about the task, the criteria, the goals and useful strategies. Praise and general encouragement increased motivation but had less direct effect on achievement, and trust in the teacher–student relationship was needed for feedback to be taken up. In one randomised study described in the review, self-referenced feedback, which shows a student how to improve, raised self-efficacy, whereas norm-referenced feedback lowered it. Three PISA-based studies found a negative link between how often students receive feedback and their achievement; the review interprets this as weaker students receiving feedback more often, not as harm caused by feedback (Brandmo & Gamlem, 2025).

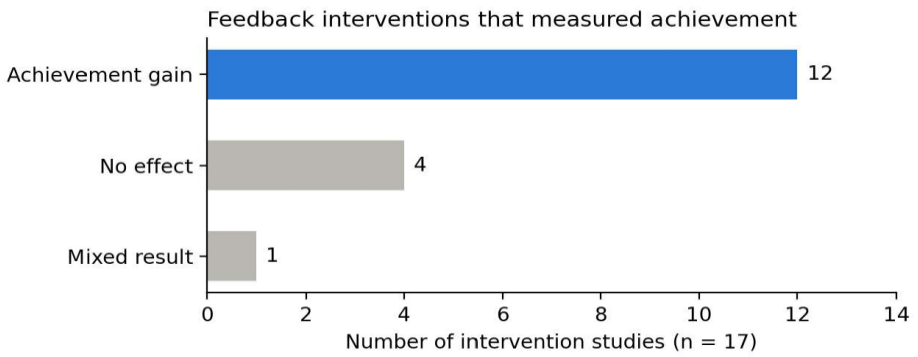


Figure 2. Outcomes reported by the 17 feedback intervention studies that measured achievement (Brandmo & Gamlem, 2025).

A large analysis of PISA 2018 data (4,838 US 15-year-olds) applied propensity-score methods to test the link between positive feedback and reading self-efficacy. Students reporting high positive feedback scored
0.18 points higher on a 4-point scale than those reporting low feedback; after adjustment for covariates the gap fell to 0.07 (SE = 0.02), and the association was stronger for students who received such feedback less often (Wang et al., 2025). The effect is modest and observational, but the authors point out that feedback is a low-cost lever. Theory identifies self-efficacy as the likely mechanism. Teacher clarity and feedback are among the strongest meta-analytic correlates of achievement, and a perceived-control model may explain how they operate through self-efficacy (Fryer & Leenknecht, 2023).

3.5 Relationships and peer interaction

Teacher–student relationships are consistently associated with learning. A meta-analysis of 119 studies and 355,325 students reported a mean correlation of r = .31 between learner-centred relationships and cognitive, affective and behavioural outcomes, a figure above the average for educational innovations
(Cornelius-White, 2007). A second meta-analysis of 99 studies found medium to large associations
between positive relationships and engagement, small to medium associations with achievement, and stronger effects in higher grades (Roorda et al., 2011). An update of the classroom-management meta-analysis (76 controlled studies) reported a small average effect (g = .23) and a move towards relationship-focused interventions, from 3.7% of earlier studies to 36.4% of newer ones (Korpershoek et al., 2026). The relationship syntheses are largely correlational, so they demonstrate association and do not prove that better relationships alone raise achievement.

Peer interaction has comparable support. A meta-analysis of 65 articles found positive effects of face-to-face cooperative learning on achievement and attitudes, with variation by study domain, age level and culture (Kyndt et al., 2013). Figure 3 shows that each of the syntheses reviewed here rests on between 42 and 119 primary studies.

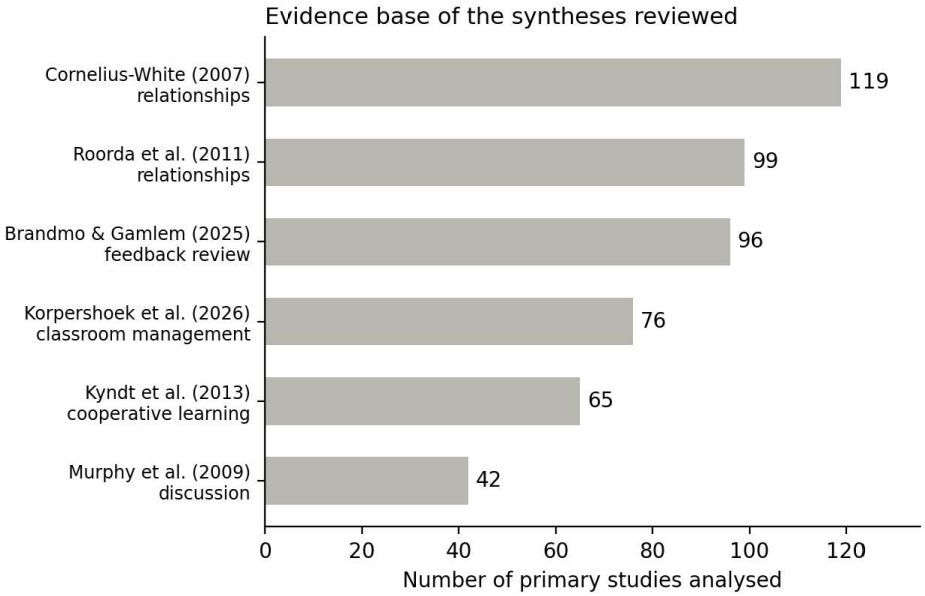


Figure 3. Number of primary studies underlying each synthesis reviewed.

3.6 Equity and context

Participation is not equal. In a US PISA sample, female students were less likely to report receiving high positive feedback (b = −0.37, p < .001) (Wang et al., 2025). Reviews note that gender, ethnicity and prior attainment shape participation in dialogue (Howe & Abedin, 2013), and that gender differences affect how feedback is received (Brandmo & Gamlem, 2025). In the dialogic trial, teachers reported that pupils with English as an additional language and lower-attaining pupils found talk-based work harder, and the trial
could not test differential effects by first language or prior attainment (Jay et al., 2017). In India,
qualitative work in four states reports that gendered and linguistic hierarchies continue to shape participation and pedagogical practice (Brookings Institution, 2026). We found no Indian study that links interaction to learning outcomes by gender or language.

4. Discussion

4.1 An integrative framework

Figure 4 brings the evidence together in one model. Four kinds of interaction (open, extended talk; discussion and peer work; specific, action-oriented feedback; supportive teacher–student relationships) are linked to three proximal mechanisms (engagement and participation, self-efficacy, and trust in the classroom) and, through them, to achievement, higher-order reasoning, and motivation and attitude. Gender, language, grade level, culture and programme length moderate these links. The framework is a synthesis of the reviewed evidence and not a tested model, and the paths towards higher-order reasoning rest on the thinnest evidence.

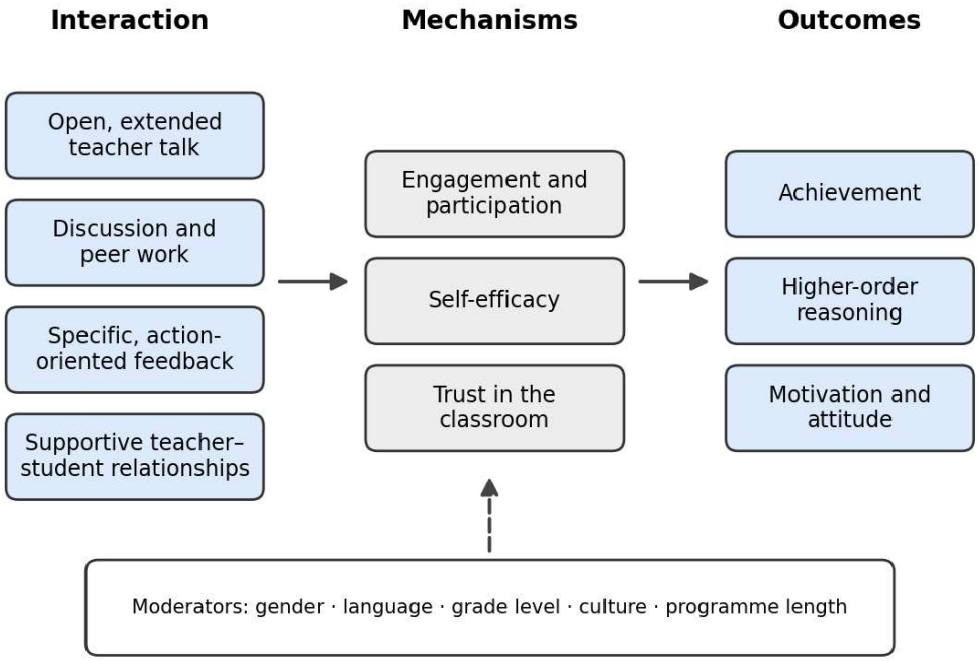


Figure 4. Integrative framework linking classroom interaction to student learning outcomes.

4.2 Implications

For teachers. Replace some closed recall questions with open questions and wait time, and follow answers with moves that ask for reasons (Alexander, 2018). Make feedback specific, action-oriented and focused on the student's own progress rather than comparison with peers (Brandmo & Gamlem, 2025). Use structured peer work (Kyndt et al., 2013), and monitor who is speaking, because participation is uneven by gender and language (Section 3.6).

For teacher education. The dialogic trial combined training with mentoring and review of teachers' own recorded lessons, and teachers valued the video review (Jay et al., 2017). Teachers in India describe their training as too theoretical (Brookings Institution, 2026). Practice-based programmes in which teachers record and discuss their own lessons respond to this gap directly.

For policy. Implementation of NEP 2020 should treat the quality of classroom talk, and not only content coverage, as an outcome worth supporting, and should allow sufficient time: most teachers in the dialogic trial judged that embedding the approach would take longer than two terms (Jay et al., 2017).

4.3 Research agenda

Four gaps follow. First, controlled studies of interaction and learning in Indian secondary schools, with pre-tests and reported effect sizes, are scarce among the sources retained here. Second, the effect of question type alone has not been tested, because trials bundle questioning with other repertoires (Alexander, 2018). Third, participation by gender and language needs outcome data, not only description. Fourth, dose and duration are unclear: teachers in the dialogic trial expected more than two terms to embed the approach (Jay et al., 2017), whereas the classroom-management meta-analysis found larger average effects for interventions of 13 weeks or less in some models (Korpershoek et al., 2026). The authors plan a quasi-experimental study, using an adapted Flanders interaction analysis with finer codes for student talk and a non-equivalent control-group design, to address the first and second gaps; its results will be

reported separately.

5. Limitations

The review has six limitations. The search was purposive and run through web sources instead of a documented database search, so relevant studies may be missing and the search cannot be reproduced exactly. Screening and extraction were done by one reviewer without double coding. Effect sizes use different metrics and come from different populations, so they cannot be ranked against each other. Most of the evidence comes from England, the United States and other Western settings, and from primary or lower-secondary pupils, so transfer to Indian secondary classrooms is untested. Some details, such as the participation variables attributed to Howe and Abedin (2013) and the study count for Murphy et al. (2009), were confirmed from secondary summaries and should be checked against the full texts. Finally, two sources are not journal articles (Jay et al., 2017; Brookings Institution, 2026), and the main account of the dialogic trial comes from its developer.

6. Conclusion

Across trials, meta-analyses and reviews, the evidence indicates that the quality of classroom interaction, rather than its amount, is what matters. Open and extended talk, feedback that is specific and action-oriented, and supportive relationships are linked to engagement, self-efficacy and, more modestly, achievement. Effects are small to moderate and may take more than two terms to appear. For India, the evidence base on secondary classrooms is thin, and questioning, gender and language are the areas where new studies would contribute most. Teacher education that enables teachers to record and review their own lessons is the most directly supported route to better interaction.

Declarations

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Competing interests: [to be completed by the authors]

Ethics: This review used published sources only. No human participants were involved.

Data availability: No new data were generated. All sources are listed in the references.

Use of AI tools: [authors to state any use of generative AI tools for drafting, searching or editing, as the target journal's policy requires]

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