Bridging the Academic Performance Gap: Understanding Student Learning Needs and the Role of Personalized 1ON1 Private Tutoring

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Abstract

Students differ in the difficulties they encounter, and uniform classroom instruction may not address every learner's needs. This manuscript examines four categories of academic learning gap (performance, support, time, and knowledge) and considers the potential role of personalized one-to-one tuition in responding to them. The empirical component is a descriptive analysis of aggregate values extracted from a supplied figure: the average number of gap factors ticked per student was 2.3 for the performance gap, 1.8 for the support gap, 1.7 for the time gap, and 1.5 for the knowledge gap (unweighted mean = 1.825; sum = 7.3). The workbook contains no student-level records, sample size, item definitions, or sampling information, so no inferential statistics are reported and the rankings are interpreted as descriptive only. A structured narrative review of research on formative assessment, mastery learning, self-regulated learning, scaffolding, and tutoring informs a conceptual framework in which diagnostic assessment, personalized planning, targeted practice, and feedback-based monitoring constitute a proposed mechanism linking gap identification to academic improvement. Meta-analytic evidence indicates that tutoring can raise attainment, but effects vary with tutor type, dosage, setting, and context, and the present data cannot show that one-to-one tuition improves performance. The paper's contribution is to align a small descriptive dataset with an explicit theoretical mechanism, to state precisely what can and cannot be concluded, and to specify a student-level quasi-experimental or randomized design capable of testing the effectiveness of personalized tuition.

Keywords: academic performance gap; learning needs; personalized learning; one-to-one tuition; formative feedback; diagnostic assessment; descriptive analysis; private tutor Pune; home tutor Pune; best home tuition Pune; 1-on-1 home tuition Pune; private home tutor Pune; personalized home tuition Pune; experienced private tutor Pune; CBSE private tutor Pune; ICSE private tutor Pune; State Board home tuition Pune; IGCSE tuition Pune; IB home tuition Pune

1. Introduction and Research Problem

Learners in the same classroom differ in prior knowledge, pace, confidence, and access to help outside school. Whole-class instruction nevertheless proceeds at a single pace, so some students acquire gaps that go unnoticed or unaddressed and later accumulate (Bloom, 1968; Carroll, 1963). The concern is long-standing. Bloom (1984) reported that students tutored one-to-one with mastery procedures performed about two standard deviations above students taught conventionally in groups, and he framed the "2 sigma problem" as the search for group methods that could match that benefit. Later syntheses indicate that the typical benefit of tutoring is smaller than Bloom's figure but still educationally meaningful (Nickow et al., 2024; VanLehn, 2011).

Personalized one-to-one tuition is attractive because a tutor can diagnose what a particular learner does not yet understand, adjust pace and explanation, and give immediate feedback. Yet the term is often used loosely in policy and commercial discourse, and enthusiasm tends to run ahead of evidence on who benefits, under what conditions, and at what cost (Bray, 2009; Nickow et al., 2024). In urban Indian education markets such as Pune, a private tutor Pune or home tutor Pune is widely sought alongside CBSE, ICSE, State Board, IGCSE, and IB schooling, and families looking for the best home tuition Pune or an experienced private tutor Pune often have little evidence with which to judge quality. Three questions are frequently conflated: (1) what learning gaps students report; (2) why tailored instruction might address such gaps; and (3) whether tuition actually improves academic performance. Only the third requires outcome data collected before and after tuition, ideally with a comparison group.

This manuscript keeps those questions separate. It analyses an aggregate dataset, extracted from a figure labelled "Fig 6", that reports the average number of gap factors ticked per student in four categories: performance, support, time, and knowledge gaps. These data permit the first question to be addressed descriptively. The second is addressed through theory and published research. The third cannot be answered with the supplied data, so the paper specifies the evidence that would be needed.

The contribution is deliberately modest and bounded: a transparent descriptive analysis of the four-category pattern, an explicit mechanism linking gap diagnosis to personalized instruction, a calibrated statement of what the evidence can and cannot support, and a design for a student-level evaluation. Section 2 states the objectives and questions; Section 3 reviews the literature; Sections 4 and 5 present the theoretical foundation and conceptual framework; Section 6 describes the methodology; Section 7 reports the results; and Sections 8 to 12 discuss implications, limitations, and conclusions.

2. Research Objectives, Questions, and Propositions

2.1 Objectives

Primary objective. To examine the major academic learning gaps experienced by students and assess the potential role of personalized one-to-one tuition in addressing their individual learning needs.

Secondary objectives. (SO1) To identify and rank the major academic learning gaps based on the available dataset. (SO2) To examine the relative importance of performance, support, time, and knowledge gaps in understanding students' learning needs. (SO3) To evaluate, using relevant empirical literature and the available evidence, how personalized one-to-one tuition may address identified learning gaps and support academic improvement.

Because the dataset is aggregate, SO1 and SO2 are pursued through descriptive comparison of the four category averages, and SO3 through literature-based evaluation. No objective claims an empirical test of tuition effectiveness.

2.2 Research questions

- *RQ1.* Which of the identified academic learning gaps has the highest average value in the available data?
- *RQ2.* How do performance, support, time, and knowledge gaps differ in their relative rankings?
- *RQ3.* How can the identified gaps inform the design of personalized one-to-one tuition and individualized learning support?
- *RQ4.* What additional empirical evidence is required to determine whether personalized one-to-one tuition improves student academic performance?

RQ1 and RQ2 correspond to SO1 and SO2 and are answered in Section 7. RQ3 corresponds to SO3 and is addressed in Sections 3 to 5, 8, and 10. RQ4 is addressed in Section 11.

2.3 Theoretical propositions

Formal statistical hypotheses are not appropriate for the supplied data. There is no sample size, variance, or individual-level observation on which a sampling distribution could be based, so significance tests would have nothing to operate on. Four labelled propositions are therefore used instead.

- *P1.* Performance-related difficulties represent a prominent area of student learning need in the available summary data. (Descriptive; assessed against the supplied summary.)
- *P2.* The identified learning gaps indicate that student support may need to address more than academic knowledge alone. (Interpretive; requires qualification.)
- *P3.* Personalized one-to-one tuition may offer a structured way to tailor instruction to students' specific learning needs. (Theoretical; examined through literature.)
- *P4.* The effectiveness of personalized one-to-one tuition requires direct evaluation using appropriate student-level outcome data. (Methodological; addressed through a proposed design.)

3. Critical Literature Review

The review is a structured narrative synthesis rather than a systematic review. Meta-analyses, systematic reviews, and widely cited peer-reviewed studies were prioritized, and the reference list contains only sources whose bibliographic details could be identified (Appendix C records the verification status).

3.1 Academic performance gaps and learning difficulties

Performance gaps are generally treated as multi-causal. Carroll's (1963) model of school learning expresses the degree of learning as a function of the time actually spent relative to the time needed, where time needed depends on aptitude, the quality of instruction, and the learner's ability to understand instruction, and time spent depends on opportunity and perseverance. The model is useful here because it places time-related, instruction-related, and learner-related constraints in one account, paralleling the four categories in the supplied data. Bloom (1968) extended this logic into mastery

learning: given adequate time and corrective help, most students can reach a defined level of mastery, so variation in outcomes reflects variation in conditions rather than fixed capacity. Mastery programmes have shown positive effects on examination performance (Kulik et al., 1990), although Guskey (2007) emphasizes that benefits depend on faithful implementation of feedback-and-correction cycles and on providing additional time to those who need it. Research on students from low-income backgrounds likewise shows that gaps can be narrowed by targeted academic interventions, with tutoring and feedback-and-monitoring approaches among those showing larger effects (Dietrichson et al., 2017). Collectively, this work suggests that attainment gaps are better treated as symptoms of specific, diagnosable shortfalls than as undifferentiated "weakness."

3.2 Individual differences, personalized learning, and differentiated instruction

Differentiated instruction proposes that teachers adapt content, process, and product to learners' readiness, interests, and learning profiles (Tomlinson, 2014). Subban (2006) reviewed its research basis, drawing mainly on theories of learning, motivation, and intelligence; such theoretical grounding should not be mistaken for direct causal evidence of effectiveness. A recurring difficulty is that "personalization" is defined in many ways, from adjusting pace to fully individualized curricula, which makes syntheses hard to compare. In ordinary classrooms, differentiation is also constrained by class size and teacher time, which is one rationale for individual tutoring as a complementary route.

3.3 One-to-one tutoring and its effectiveness

Evidence on tutoring is extensive but heterogeneous. Early meta-analytic work found that tutored students outperformed controls by roughly four-tenths of a standard deviation on examinations (Cohen et al., 1982). Bloom's (1984) much larger figure came from studies that combined tutoring with mastery procedures, and VanLehn (2011) concluded that the effect of human tutoring was closer to 0.79 standard deviations than to Bloom's 2.0, while also finding that well-designed step-based computer tutors performed comparably to human tutors. Kulik and Fletcher (2016) reported a median effect of 0.66 for intelligent tutoring systems in controlled evaluations, which suggests that individualized support need not always be delivered by a human. Ritter et al. (2009) found positive but more modest effects for volunteer tutoring programmes in elementary and middle schools.

The most comprehensive recent synthesis of randomized evaluations pooled 89 trials and estimated an overall effect of 0.288 standard deviations on learning outcomes (Nickow et al., 2024). Effects were larger for programmes delivered by teachers or paraprofessionals, in earlier grades, with at least three sessions per week, and during the school day. An earlier working-paper version reported a larger pooled estimate (0.37 SD); the published figure is used here. Two cautions follow. First, the review defined tutoring as one-on-one or small-group instruction, so its estimates do not isolate the specific contribution of strictly individual tuition. Second, the included trials were drawn predominantly from high-income countries (Poverty Action Lab, 2024), so transfer to other educational systems cannot be assumed. Taken together, the literature supports the view that structured tutoring can raise attainment, while showing that magnitude depends on who tutors, how often, where, and for whom.

3.4 Formative assessment, feedback, and self-regulation

Sadler (1989) argued that learners improve when they know the desired standard, can compare their current performance with it, and can act to close the gap, a formulation that maps directly onto diagnostic tutoring. Black and Wiliam (1998) concluded that formative assessment can raise attainment, with particular benefit for lower-attaining students. Hattie and Timperley (2007) showed that the effect of feedback varies widely with its content: feedback is most useful when it answers where the learner is going, how they are progressing, and what to do next, and when it addresses the task, the process, and self-regulation rather than offering praise alone. Chi et al. (2001) analysed tutoring dialogues and found that learning was associated with students' own constructive responses, not simply with tutors' explanations, implying that the advantage of tutoring may lie in the interactive opportunities it creates. Self-regulated learning research adds that performance difficulties may originate in weak planning, monitoring, or motivation rather than missing content (Panadero, 2017; Zimmerman, 2002); effective tutoring would then need to teach strategies as well as subject matter.

3.5 Barriers to personalized educational support

Three groups of barriers recur. The first is cost and access. High-dose, in-school tutoring is resource-intensive, and private tutoring outside school depends on household ability to pay; Bray (2009) documents how private supplementary tutoring can widen inequality, distort mainstream schooling, and vary greatly in quality and regulation. The second is tutor quality: the moderator results above (Nickow et al., 2024; Ritter et al., 2009) suggest that training, structure, and

professional experience matter. The third is student engagement and dependence. Tutoring is only as effective as the learner's participation, and the possibility that students come to rely on external help rather than develop independent regulation is a theoretical concern that deserves empirical study; the reviewed sources do not quantify it.

3.6 Research gap addressed by this manuscript

The sources reviewed here do not organize their analysis around the four-category typology (performance, support, time, knowledge) present in the supplied data, and few link student-reported gap profiles to the design of tutoring. Because a comprehensive systematic search was not conducted, this observation describes the limits of the present review, not a proven absence of such studies. The manuscript addresses the gap in a limited way: it connects an aggregate gap profile to a theory-based design for personalized tutoring and specifies how effectiveness should be tested.

4. Theoretical Foundation

Three bodies of theory most directly explain how learning gaps arise and how tailored help might close them. Other perspectives, such as motivational and sociocultural theories, are relevant but are not developed here so that the framework stays tied to the data categories.

Mastery learning and formative assessment. In this tradition a gap is the distance between a learner's current understanding and a defined standard, closed by diagnosing the discrepancy, providing corrective instruction, and re-checking (Bloom, 1968; Sadler, 1989). Carroll's (1963) time-based model explains why insufficient time relative to need produces shortfalls, and why missing prerequisites compound over time.

Zone of proximal development and scaffolding. Vygotsky (1978) held that learning is most productive in the zone between what a learner can do alone and what can be done with assistance. Wood et al. (1976) described tutoring as scaffolding, in which a more knowledgeable partner controls the aspects of a task that the learner cannot yet manage and withdraws support as competence grows. A one-to-one tutor can in principle estimate this zone for one learner and calibrate help accordingly.

Self-regulated learning. Zimmerman (2002) describes learners as agents who cycle through forethought, performance, and self-reflection phases. Shortfalls in planning, monitoring, or motivation can depress performance even when knowledge is adequate (Panadero, 2017).

Interpretive mapping. Because the workbook does not define the categories, the following mapping is a theoretical interpretation and not a finding: knowledge gaps correspond to missing prerequisites in mastery models; time gaps to the time-needed versus time-spent relation in Carroll's model; support gaps to the availability of scaffolding within the zone of proximal development; and performance gaps to the observable outcome of any of these, as well as of weaknesses in self-regulation and feedback use.

Proposed mechanism. Identification of a learner's gaps (diagnosis) specifies learning needs; a plan is then matched to the learner's current level and mastery targets; targeted explanation and practice are delivered with scaffolding; feedback and monitoring data show whether the gap is closing and feed back into the plan. Improvement is expected only if diagnosis is accurate, instruction is genuinely adapted, the learner engages and practises, and feedback is informative (Hattie & Timperley, 2007). Failure at any link attenuates the expected benefit. These are theoretical expectations; none is demonstrated by the supplied data.

5. Conceptual Framework

Figure 1 depicts the proposed chain from gap identification to potential academic improvement. Personalized one-to-one tuition is shown as a proposed mechanism whose effectiveness is the object of future testing, with the outcome box drawn with a dashed border to signal that it is hypothesised. The left-hand box represents the learning-gap profile that the supplied data describe at aggregate level. The loop from feedback and monitoring back to diagnosis represents the iterative character of the process: monitoring information triggers re-planning.

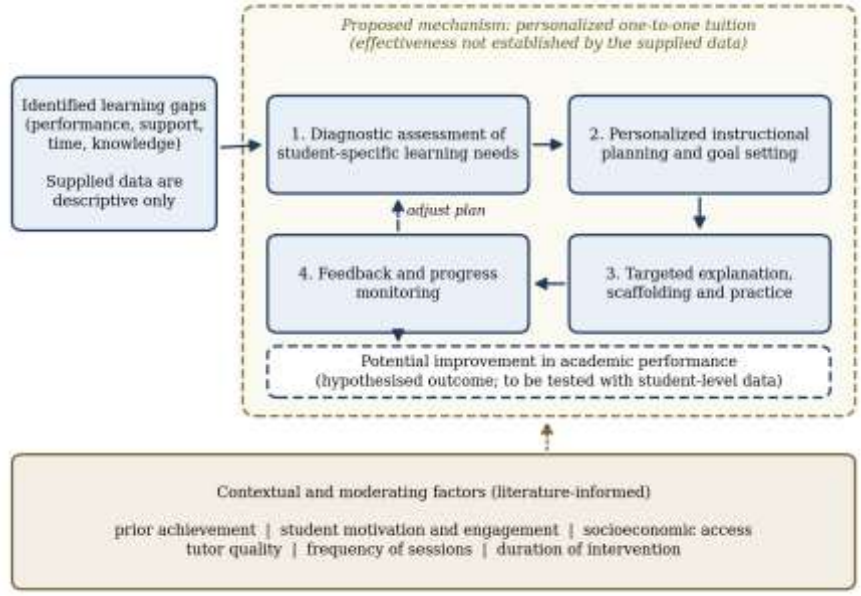


Figure 1. Conceptual framework linking learning-gap identification to personalized one-to-one tuition and potential academic improvement.

Source: Author's conceptual synthesis based on Bloom (1968), Carroll (1963), Hattie and Timperley (2007), Vygotsky (1978), Wood et al. (1976), and Zimmerman (2002). The diagram is a proposed mechanism, not an empirically estimated model.

Moderating and contextual factors are drawn from the literature reviewed in Section 3: prior achievement and grade level (Nickow et al., 2024), student motivation and engagement (Zimmerman, 2002), socioeconomic access (Bray, 2009; Dietrichson et al., 2017), tutor quality (Nickow et al., 2024; Ritter et al., 2009), session frequency (Nickow et al., 2024), and duration of intervention. None of these is measured in the supplied data. An editable specification of the diagram is as follows: nodes are N0 (learning-gap profile), N1 (diagnostic assessment), N2 (personalized planning), N3 (targeted explanation and practice), N4 (feedback and monitoring), and N5 (potential academic improvement); directed edges are N0→N1→N2→N3→N4→N5, with a return edge N4→N1; and moderators act on the N1–N5 chain as a group.

6. Research Methodology

6.1 Research design

The study is a descriptive, exploratory, evidence-informed analysis. Its empirical component is a secondary analysis of aggregate summary data from the supplied workbook, complemented by the structured narrative literature review in Section 3. It is not a student survey, experiment, quasi-experiment, or causal study, and it is not described as such, because the file contains no evidence that would support those classifications.

6.2 Data source and provenance

The data source is the Excel workbook *Academic_Performance_Gap_Factors_Data.xlsx*, which contains a single visible worksheet ("Gap Factors Data", range A1:C21). It holds four category values with formula-driven ranks, summary statistics (maximum, minimum, mean, sum), an embedded bar chart, and a note stating that the data were "extracted exactly from the provided figure (Fig 6)" and that the values represent the average number of gap factors ticked per student. The workbook does not identify the original publication, study, instrument, or institution from which the figure came. The provenance of the summary values and of the underlying sample therefore cannot be established from the file alone.

The following were not found in the workbook and are not assumed anywhere in this manuscript: sample size, student demographics, institution or geographical location, data-collection dates, questionnaire items, sampling method, response rate, reliability or validity statistics, ethical approval, and data-collection procedures. They are listed for researcher confirmation in Appendix A.

6.3 Variables and operational definitions

The single measured variable is the average number of gap factors ticked per student within each category. It is a count-type mean. Its possible range depends on the number of factors listed in each category, which the workbook does not state; consequently the values are not percentages, proportions, or Likert-scale scores. Table 1 lists the categories. The workbook supplies no category definitions, so the "working interpretation" column is a provisional reading derived only from the category labels and requires clarification by the researcher.

Table 1

Variables, Workbook Status, and Provisional Working Interpretation

Gap category	Workbook definition	Provisional working interpretation (to be confirmed)	Reported measure
Performance gap	Not supplied	Factors related to attainment shortfalls or unsatisfactory academic results	Average ticks per student
Support gap	Not supplied	Factors related to insufficient guidance, help, or resources from teachers, family, or institution	Average ticks per student
Time gap	Not supplied	Factors related to limited time available for learning, revision, or practice	Average ticks per student
Knowledge gap	Not supplied	Factors related to missing prerequisite knowledge or conceptual understanding	Average ticks per student

Note. Category labels are taken from the workbook. Interpretations are provisional and are not established definitions. Values and ranks are reported in Table 4.

6.4 Statistical techniques and rationale

Techniques were chosen to match what the data can support (Table 2). The overall average of 1.825 is the unweighted arithmetic mean of the four category averages (7.3 ÷ 4), which treats each category as equally weighted; a weighted mean would require the number of listed factors or respondents per category. The sum of 7.3 would equal the average total number of ticks per student only if the four factor lists were mutually exclusive and jointly exhaustive of the checklist; this is not established. Neither figure is a validated composite score.

Table 2

Statistical Techniques Applied and Not Applied, with Rationale

Technique	Applied?	Rationale
Data validation and consistency checks	Yes	Confirms that reported values, ranks, and summary statistics are arithmetically consistent
Descriptive summary and ranking	Yes	Appropriate for four ordered category averages; answers RQ1 and RQ2
Absolute differences between averages	Yes	Describes spread without requiring variance or sample size
Relative comparisons (ratios, percentage differences)	Yes, qualified	Interpretable only descriptively because the number of listed factors per category is unknown
Bar chart of category averages	Yes	Displays the four actual values; no error bars because no dispersion data exist
t-tests, ANOVA, regression, correlation, chi-square	No	Require individual observations or group sizes and variances; none available

Technique	Applied?	Rationale
Factor analysis, SEM, Cronbach's alpha, mediation	No	Require item-level or student-level data
Causal inference	No	No tuition exposure measure, comparison group, or pre/post outcomes

Note. If student-level data become available, appropriate analyses would include distributional summaries per student, within-student overlap among categories, reliability analysis of the checklist, and, for tuition evaluation, models of post-test outcomes adjusted for baseline (Section 11). No such analyses have been performed here.

6.5 Ethical and reporting considerations

No new data from human participants were collected for this analysis. Ethical approval and consent procedures for the original data collection cannot be confirmed from the workbook and must be reported by the researcher before submission, in line with established guidance for educational research (British Educational Research Association [BERA], 2018).

7. Results and Descriptive Data Analysis

7.1 Data validation

All checks in Table 3 were run directly against the workbook. The reported values, ranks, and summary statistics are internally consistent; the only failed checks concern information the workbook does not contain.

Table 3
Data Validation and Consistency Checks

Check	Outcome	Workbook value	Status
Number of sheets, categories, values	1 sheet; 4 categories; 4 values	4	Pass
Category values match the stated figures	2.3, 1.8, 1.7, 1.5	Same	Pass
Ranks recomputed (descending, no ties)	1, 2, 3, 4	1, 2, 3, 4	Pass
Maximum and minimum	Max 2.3 (performance); min 1.5 (knowledge)	Same	Pass
Sum of category averages	2.3 + 1.8 + 1.7 + 1.5 = 7.3	7.3	Pass
Unweighted mean	7.3 ÷ 4 = 1.825	1.825	Pass
Sample size, definitions, sampling, instrument	Not present in file	Absent	Not verifiable

Note. Checks were performed on the cached formula results and recomputed independently.

7.2 Descriptive summary

Table 4 reports the four averages and ranks. The performance gap has the highest value (2.3) and the knowledge gap the lowest (1.5), a range of 0.8. The column "share of summed averages" expresses each average as a proportion of 7.3; it is a descriptive rescaling and is not a prevalence estimate.

Table 4

Descriptive Summary of Academic Learning Gaps

Gap category	Average no. of gap factors ticked per student	Rank	Share of summed averages (%)	Deviation from unweighted mean (1.825)
Performance gap	2.3	1	31.5	+0.475
Support gap	1.8	2	24.7	-0.025
Time gap	1.7	3	23.3	-0.125
Knowledge gap	1.5	4	20.5	-0.325
Overall (unweighted mean) / total	1.825 / 7.3	n/a	100.0	0.000

Note. Source: *Academic_Performance_Gap_Factors_Data.xlsx* (values extracted from "Fig 6"). Shares and deviations are derived by the author and rounded to one decimal place (shares) or as shown (deviations). Averages are counts, not percentages.

7.3 Pairwise differences

Table 5 gives absolute differences and relative comparisons for all six pairs. The performance gap exceeds the support gap by 0.5, the time gap by 0.6, and the knowledge gap by 0.8. The three lower-ranked categories lie within 0.3 of each other. Because the values are reported to one decimal place, each could differ from its unrounded value by up to 0.05, so the 0.1 difference between the support and time gaps is within rounding resolution and the order of those two categories should be treated as tentative.

Table 5

Pairwise Differences in Category Averages

Comparison	Higher value	Lower value	Absolute difference	Higher as % above lower
Performance vs. support	2.3	1.8	0.5	27.8
Performance vs. time	2.3	1.7	0.6	35.3
Performance vs. knowledge	2.3	1.5	0.8	53.3
Support vs. time	1.8	1.7	0.1	5.9
Support vs. knowledge	1.8	1.5	0.3	20.0
Time vs. knowledge	1.7	1.5	0.2	13.3

Note. Percentages are (higher - lower) ÷ lower × 100, rounded to one decimal place. They are descriptive and carry no significance test because no dispersion or sample-size information is available.

7.4 Graphical summary

Figure 2 plots the four category averages. The performance gap is visibly higher than the other three, which form a compact lower group. The dashed line marks the unweighted mean of 1.825; it is a reference line, not a benchmark. No error bars are drawn because the workbook contains no dispersion data.

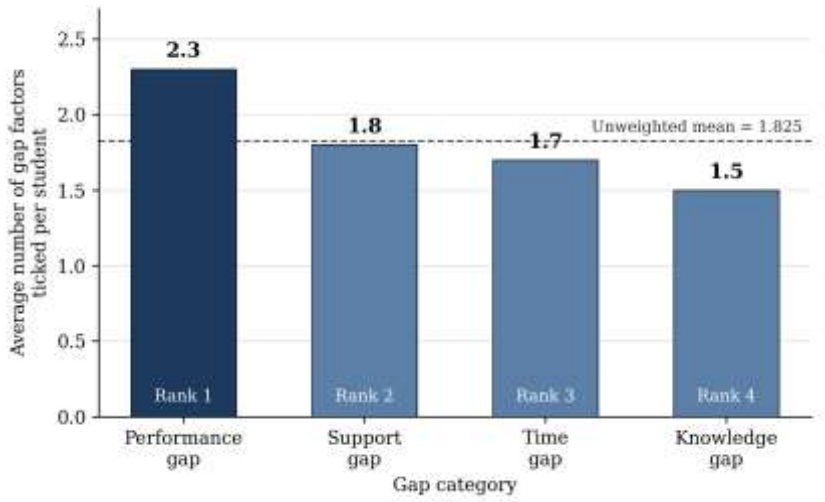


Figure 2. Comparative distribution of reported gap averages: average number of gap factors ticked per student by gap category.

Source: Author's chart of values in Academic_Performance_Gap_Factors_Data.xlsx (originally extracted from "Fig 6"). The y-axis starts at zero. No confidence intervals or significance indicators are shown.

7.5 Interpretation

Why the performance gap ranks first. The data show only that this category received the highest average number of ticks; they do not reveal why. Plausible explanations include that performance difficulties are the most visible and easily recognized symptom for students, that the category captures outcomes to which several underlying causes contribute, or that the checklist contains more performance items than other categories. The last possibility cannot be examined because the number of listed factors per category is not supplied.

Support and time gaps. The support gap (1.8) and time gap (1.7) are close to each other and sit 0.5 and 0.6 below the performance gap. Their near-equivalence, together with the rounding resolution noted above, argues against emphasizing the order of the two.

The lower rank of the knowledge gap. The knowledge gap's lowest average does not imply that it is unimportant. Knowledge deficits may be a proximal cause of performance shortfalls and thus be partly reflected in the performance category; students may also be less able to identify what they do not know than to observe low results; and a smaller number of knowledge-related items would mechanically yield a lower count.

Needs beyond subject knowledge. Three of the four categories (performance, support, time) are not purely about content, and together they account for 5.8 of the 7.3 summed averages (79.5%). This is consistent with P2, that learning needs may extend beyond subject knowledge, but the categories may overlap and the performance category may itself include content difficulties, so the pattern is suggestive and not conclusive. Students could tick several factors, so the categories cannot be assumed to be mutually exclusive or independent.

7.6 Answers to RQ1 and RQ2, and limits of inference

RQ1. The performance gap has the highest reported average (2.3), supporting P1 as a descriptive proposition. *RQ2.* The ranking is performance (2.3), support (1.8), time (1.7), knowledge (1.5); the performance gap is separated from the others by at least 0.5, whereas the support-time distinction (0.1) is not robust to rounding. A higher average denotes a higher reported aggregate value; it does not establish statistical significance, causal importance, or the proportion of students affected. The results say nothing about whether one-to-one tuition improves performance, because the workbook contains no measure of tuition exposure and no before-and-after outcomes.

8. Discussion

The descriptive pattern, taken with the reviewed literature, suggests that a reported performance shortfall should be read as a prompt to diagnose underlying barriers and not as a direct instruction to increase study time. Carroll's (1963) model implies that more time helps only when the quality of instruction and the learner's readiness are adequate; formative-assessment research implies that the value of additional time depends on whether feedback tells the learner how to close

the gap (Hattie & Timperley, 2007; Sadler, 1989). That support and time gaps follow the performance gap in the supplied data is compatible with this view, although, as shown above, the data cannot establish it.

If tuition is considered, the theory points to six functions in which individualized instruction may be advantageous. A tutor can (a) identify specific areas of difficulty through diagnostic questioning, (b) adapt the pace of instruction, (c) provide targeted practice at the appropriate level of challenge, (d) deliver immediate and specific feedback, (e) support confidence and engagement through responsive interaction, and (f) monitor progress and revise the plan. These functions correspond to the mechanism in Figure 1. Chi et al. (2001) suggest that the benefit may depend on how much constructive activity the tutor elicits from the learner, so personalization that merely repeats lecture-style explanation may deliver less than expected.

Alternative explanations for a performance gap deserve equal weight: weak prior knowledge, curriculum difficulty, irregular attendance, variable teaching quality, assessment design, health, or external constraints such as family responsibilities or long commuting time. Several of these lie outside the reach of tuition. If the dominant causes are structural, for example inadequate classroom resources, additional tutoring may do little, and school-level responses could be more appropriate.

The evidence also does not support presenting one-to-one tuition as universally superior. Meta-analytic estimates for tutoring combine individual and small-group formats (Nickow et al., 2024); computer-based tutors have shown effects comparable with human tutors in some settings (Kulik & Fletcher, 2016; VanLehn, 2011); and, for students from low-income backgrounds, other approaches such as feedback and monitoring or cooperative learning also showed substantial effects (Dietrichson et al., 2017). The appropriate conclusion is conditional: personalized tuition is one plausible response among several, whose relative merit depends on the learner, context, cost, and delivery quality.

9. Theoretical Implications

The analysis offers three modest theoretical implications. First, the four gap categories can be read as a diagnostic taxonomy that connects to distinct theoretical constructs (time needed versus spent, mastery of prerequisites, scaffolding, and self-regulation), suggesting that "learning gap" should be treated as a multidimensional construct and not as a single deficit. Second, specifying tuition as a mechanism composed of diagnosis, planning, practice, and feedback converts "tuition works" from a black-box claim into a set of testable links; each link (for example, diagnostic accuracy leading to adapted instruction, or feedback quality leading to gains) could be examined in mediation analyses once suitable student-level data exist. Third, the framework is a theoretical proposal. The supplied data neither test nor refine it, and its value will be judged by whether future evidence supports the proposed links and moderators.

10. Practical and Policy Implications

Recommendations are separated by evidential basis in Table 6. Only the first row rests on the supplied data, and that support is limited to the descriptive pattern. The others rest on external literature or theoretical reasoning.

Table 6

Evidence-Informed Recommendations by Stakeholder and Evidential Basis

Stakeholder	Recommendation	Evidential basis
Schools and colleges	Screen for multiple gap types, not only content knowledge, and record them to guide support allocation	Current data (descriptive pattern); theory
Schools and colleges	Where tutoring is provided, prefer trained staff, frequent sessions, and school-day delivery; evaluate with comparison groups	External literature (Nickow et al., 2024)
Teachers	Use formative checks to detect specific gaps; give feedback on task, process, and self-regulation	External literature (Hattie & Timperley, 2007; Black & Wiliam, 1998)

Stakeholder	Recommendation	Evidential basis
Private tutors and providers	Begin with a diagnostic assessment, set individual goals, track progress, and plan for withdrawal of support	Theory (scaffolding; mastery learning)
Parents and caregivers	Ask providers how diagnosis, goals, and progress reports are handled; ask about time-use and support at home before adding sessions	Theory; external literature (Bray, 2009)
Policymakers	Consider targeted, subsidized tutoring for students with greatest need; regulate quality, safeguarding, and data protection	External literature (Bray, 2009; Dietrichson et al., 2017)
Education-technology platforms	Offer diagnostic engines and progress dashboards; evaluate against human tutoring and publish outcome evidence	External literature (Kulik & Fletcher, 2016; VanLehn, 2011)

Note. "Current data" indicates support limited to the descriptive pattern in Section 7; no recommendation is supported by tuition-outcome data from this study.

A structured tutoring process. The theory supports a six-step cycle: (1) initial diagnostic assessment of knowledge, strategies, time use, and support context; (2) individualized learning goals; (3) a tailored instructional plan; (4) regular, specific feedback; (5) progress tracking against the goals; and (6) periodic reassessment, with the plan revised or tutoring reduced as goals are met.

Application to the Pune context. The same cycle can guide 1-on-1 home tuition Pune and personalized home tuition Pune, in which a private home tutor Pune visits the learner at home and can observe study conditions, time use, and support directly. Demand is concentrated in Maths, Physics, and Chemistry for Classes 9–12, so searches such as Maths home tuition Pune and Physics tutor Pune are common. Typical needs include Class 10 home tuition Pune, Class 12 private tutor Pune arrangements, Class 11 Maths tuition Pune, and Class 12 Physics home tuition Pune, as well as board-specific support such as a CBSE Class 10 Maths tutor Pune or a 1-on-1 Maths tutor Pune. Physics tuition for Class 12 Pune, in particular, benefits from diagnosis of conceptual gaps before problem practice. These examples illustrate where the framework could be applied; they are not findings of this study.

Curriculum-specific and local needs. Provision differs by curriculum, and families look for a CBSE private tutor Pune, ICSE private tutor Pune, State Board home tuition Pune, IGCSE tuition Pune, or IB home tuition Pune according to the board their child follows. ICSE & International Board home tuition Pune and IB & Open Schooling support are sought by families outside the CBSE and State Board mainstream. Demand is also hyperlocal within the city: families in the eastern corridor look for Wagholi & Pune Nagar Road home tuition Wagholi, while others search for a private tutor Kharadi or a 1-on-1 tutor Hadapsar & Baner & Kothrud, which shows that tutor availability and travel time are practical considerations in choosing home-based support. Because such searches rarely reveal tutor training, diagnostic practice, or progress reporting, the questions in Table 6 give caregivers a practical basis for choosing among providers.

Equity, quality, and safeguards. Affordability and equitable access are central: if tutoring is available mainly to households that can pay, it may widen attainment differences (Bray, 2009). Tutor qualifications and training should be explicit, given the moderator evidence reviewed above. Student data from diagnostics require privacy protection, and tutoring involving minors needs safeguarding procedures such as background checks and transparent communication with caregivers. Finally, programmes should aim at growing learner independence, to reduce the risk of dependence on additional tuition; this is a theoretical concern, not an empirically quantified one.

11. Limitations and Future Research

11.1 Limitations

The principal limitations arise from the aggregate nature of the data.

- There are no individual student-level observations, so within-student overlap among categories and dispersion cannot be examined.
- The sample size and sampling procedure are unconfirmed, so representativeness is unknown.

- No inferential statistics can be computed, and the ranking carries no statement of statistical significance.
- There is no direct measure of exposure to one-to-one tuition, and no pre- or post-intervention academic outcomes, so causation cannot be assessed.
- The original definitions and measurement of the categories, including the number of items per category, are uncertain, which limits interpretation of relative magnitudes.
- The literature review is narrative and not a systematic review, and its coverage is selective.

11.2 Proposed follow-up study

A rigorous test of personalized tuition requires student-level data. Table 7 outlines a design in which the tutoring intervention is delivered and recorded, baseline achievement is measured, and outcomes are compared against an appropriate group. Where feasible, students would be randomized to tutoring or to a waitlist or usual-support control; where randomization is not possible, a carefully designed quasi-experiment (for example, matched comparison with baseline adjustment) would be used (Shadish et al., 2002). Baseline differences, attrition, confounding factors, and ethical requirements, including the withholding of potentially beneficial support from a control group, must be addressed in advance.

Table 7

Outline of Proposed Student-Level Evaluation

Design element	Specification
Design	Preferably individually randomized trial with waitlist control; otherwise matched quasi-experimental comparison with pre-registered analysis plan
Participants	Students identified with learning gaps via diagnostic screening; sample drawn from defined institutions and grade levels (to be specified)
Intervention	Personalized one-to-one tuition following the six-step cycle in Section 10; frequency, session length, and duration recorded for every student
Baseline measures	Curriculum-aligned prior achievement test; gap-factor checklist with defined items per category; time-use and support-context items
Outcome measures	Curriculum-aligned post-test (primary); self-regulation and motivation using a validated instrument such as the MSLQ (Pintrich & De Groot, 1990; Pintrich et al., 1991)
Analysis	Post-test outcome modelled with baseline adjustment and treatment indicator; subgroup and dose analyses; attrition and sensitivity analyses
Ethics	Institutional review, informed consent or assent, safeguarding, data protection (BERA, 2018)

Note. The design is a proposal. It has not been implemented, and no results from it are reported.

Sample size. A sample-size calculation is meaningful only after design, outcome, and assumptions are fixed. As an illustration under explicit assumptions (individual randomization, two equal groups, a continuous standardized outcome, two-sided $\alpha = .05$, power = .80, a true standardized effect of $d = 0.30$ chosen to approximate the pooled estimate of Nickow et al., 2024), the standard formula $n = 2(z_{1-\alpha/2} + z_{1-\beta})^2 \div d^2$ gives approximately 175 students per group before allowing for attrition and clustering (Cohen, 1988). The smallest effect of practical interest should be set on substantive grounds (Kraft, 2020), and the calculation should be redone once the instrument and design are final.

Future work should also record which gap types each student reports and test whether tutoring effects differ by gap profile, and should compare personalized tuition with group tutoring, classroom-based differentiation, and technology-based alternatives.

12. Conclusion

This paper analysed four aggregate values on the average number of gap factors ticked per student and related them to a theory-based account of personalized one-to-one tuition. In answer to RQ1, the performance gap had the highest average (2.3). In answer to RQ2, the ranking was performance (2.3), support (1.8), time (1.7), and knowledge (1.5), with the order of support and time within rounding resolution. The pattern is consistent with the proposition that learning needs may extend beyond subject knowledge, though the categories may overlap and the original definitions are unknown.

In answer to RQ3, the gaps suggest that personalized tuition should begin with diagnosis of several types of need, adapt instruction to the learner's current level, and use feedback and monitoring to adjust the plan, in line with mastery learning, scaffolding, and self-regulated learning. In answer to RQ4, establishing effectiveness requires student-level data, measures of tuition frequency and duration, baseline and post-intervention achievement, and a suitable comparison group.

The study's findings are descriptive. They provide no evidence that one-to-one tuition improves academic performance; the published meta-analytic evidence suggests that tutoring can help, but with effects that depend on context and implementation. The main contribution is a transparent alignment of a small aggregate dataset with an explicit mechanism and a defined testing agenda. The next step is a pre-specified randomized or quasi-experimental evaluation that records tuition exposure and measures outcomes.

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Appendices: Author Pre-Submission Notes (Not Part of the Manuscript; Remove Before Submission)

Appendix A. Missing data and methodological details the researcher must confirm

Item	Why it is needed	Status in workbook
Original source of "Fig 6"	Establishes provenance and whether the data are the researcher's own or reproduced	Not stated
Sample size (n) and response rate	Needed for any inference and to judge representativeness	Absent
Sampling method and population	Determines generalizability	Absent
Student demographics, grade, institution, location	Required context for interpretation and for equity discussion	Absent
Data-collection dates and procedure	Needed for reporting and replication	Absent

Item	Why it is needed	Status in workbook
Questionnaire items per category	Needed to interpret averages (maximum possible ticks per category) and compare categories fairly	Absent
Definitions of the four gap categories	Replaces provisional interpretations in Table 1	Absent
Whether categories overlap and whether a tick can belong to several	Determines meaning of the sum (7.3) and of the shares	Absent
Reliability and validity evidence for the checklist	Supports measurement claims	Absent
Ethical approval and consent details	Journals require them for human-participant data	Absent
Student-level raw data	Would permit dispersion, overlap, and group analyses	Absent
Exposure to tuition (type, frequency, duration) and outcome measures	Needed to test any claim about tuition effectiveness	Absent

Appendix B. Final readiness assessment

Overall judgement: The manuscript is internally consistent and aligned with the supplied data, but it is not ready for submission as an empirical journal article. It is suitable for internal review as a conceptual and descriptive paper once the blocking issues below are resolved. Acceptance, indexing, or publication cannot be guaranteed, and fit with any specific journal has not been checked.

Issue	Severity	Required action
Provenance, sample, and ethics of the underlying data unknown	Blocking	Document the original study, sample, instrument, and ethical approval, or reposition the paper as a conceptual analysis with illustrative data
Only four aggregate values; no inferential analysis possible	Blocking for empirical claims	Obtain student-level data or retain purely descriptive framing; avoid significance language
No evidence on tuition effectiveness	Major	Keep conclusions as stated; add outcome data if the claim is to be strengthened
Category definitions and item counts unknown	Major	Supply definitions and items; revise Table 1 and Section 7.5
Reference accuracy	Major	Resolve every DOI and page range against publisher records (Appendix C)
Journal fit, scope, word limit, and formatting	Minor	Select a target journal, then adapt article type, length, and reference style
Corresponding author, ORCID, funding, conflicts, data availability statement	Minor	Author names and affiliations are now included; complete the remaining items before submission

Appendix C. Reference verification log

Bibliographic details of Nickow et al. (2024) and Dietrichson et al. (2017) were checked online during preparation (titles, authors, journal, and, for the latter, volume, issue, and pages). For Nickow et al., the online summary confirmed a pooled effect of 0.288 SD from 89 randomized trials, and the earlier working paper reported 0.37 SD. The remaining references are well-established works cited from standard bibliographic knowledge; their DOIs, page ranges, and quoted effect sizes were not individually resolved against publisher pages and must be verified before submission. No reference was invented, and anything that could not be identified was excluded. Poverty Action Lab (2024) is a web page and its content should be re-checked at submission.