

Characterising Effective Teaching

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Most people can remember an inspirational teacher from their school days. Probably, many people can also remember another teacher whose awful lessons were a total turn-off. One of us vividly remembers two history teachers from high school: one of them inspiring a life-long interest in one particular period of history, the other so desperately dull that all content has been deleted from memory. Why? What did those teachers do differently in the classroom to provoke such opposite responses? Broadening the question, what about teachers in general – how do classroom practices differ between teachers? And most importantly, how do those actions relate to outcomes for their pupils? Are some classroom activities more effective than others in terms of pupil progress?

In fact, we know very little about what effective teaching actually looks like. By “effective teaching” we mean teaching which accelerates students’ learning, as measured by achievement tests. This might be surprising for some people – that we do not have good evidence on the effects on test scores of for example ‘chalk and talk’ relative to ‘interactive group activities’.

The central concept of teacher effectiveness is a black box: it describes the outcome of what teachers do, without giving much of a clue as to how to work towards improving it. We know there are substantial differences between teachers in their contributions to their students’ outcomes, but evidence about why those contributions differ remains quite scarce.

This problem is compounded by the fact that few observable teacher characteristics are correlated with effectiveness, making the characterisation of effective teaching harder still. This matters because teaching matters. In fact, whether you have an effective teacher or not is by far the most important factor influencing your GCSEs, outside of your family background.

In this research we are unlocking the black box, beginning to characterise effective teaching, with a huge input from teachers themselves. In a large-scale study, the first of its type in England, we can identify which teaching practices contribute best to raising pupils’ GCSEs. Our work also leads to a cheap and easy tool that teachers and teacher-leaders can use to identify and improve skills. Our findings therefore help students (better GCSEs means better life chances), teachers (offering a way to evaluate and improve their own teaching practices), and school leaders (potentially raising the success of teacher recruitment).

The big question which motivates our work is: which teaching practices matter for student achievement? To do this we combine two types of data: detailed classroom observation of teachers by teachers, and the test scores of the students they teach. While this has been done a few times in the US, it is unique data for England, involving observations over two years and at scale. In total we looked at around 14,000 GCSE scores (7000 students with Maths and English scores) in 32 schools and related that to observations reports on 251 teachers over two years.

Results

The relationships we show between teachers' observed practices and student test scores are educationally and economically meaningful: GCSEs rise or fall with the teacher effectiveness ratings and variation in class time use.

While these effects are small as a share of the total variation in test scores, they are large as a share of teachers' contributions to test scores, around one-third of the teacher's entire contribution to student learning. This is what we mean by characterising effective teaching. We summarise some of our findings here; [Characterising Effective Teaching full report](#)

First, teachers make different choices about how to spend class time: there is considerable variation in the activities that different teachers deploy. This variation remains even controlling for the characteristics of their students and for the subject (English or maths). For example, some teachers spend much of class using traditional direct instruction, including lecturing and the use of textbooks, while other teachers devote more class time to students working with their classmates or individual practice. Most importantly, these choices on the use of class time matter for their students' achievement. In maths classes, for example, students score higher on the GCSE exams when assigned to teachers who give more time for individual practice. For English exams, by contrast, more time working with classmates predicts higher scores. This is not simply about the skills of the teacher: class time use predicts student test scores even after controlling for the effectiveness of teaching, as measured by peers' ratings of effectiveness.

Imagine two students who are similar except that the first student is assigned to an English teacher with typical English classroom activities, while the second student has a English teacher who devotes significantly more time for peer interaction (one standard deviation more). The second student will score significantly higher in English GCSEs, rising up the test score distribution by about 3 percentile points. While this difference is small as a share of the total variation in student test scores, it is a significant fraction of the teachers' contribution to learning.

Another way to think about magnitude is to ask what such an improvement in GCSE scores would mean for a student's life chances. GCSE scores are very relevant for students' futures, influencing both job market chances and university admissions. A teacher increasing scores by that amount for her class of 30 generates an additional £150k of lifetime income for her students, every year. The predicted earnings gains are perhaps twice as high for increases in maths GCSE scores; and furthermore, as the impact of teacher effectiveness is greater for lower ability students, the subsequent earnings gain would also be greater for them. This scale of impact illustrates the potential of following up the detailed analysis of teacher practices described in our project with a fine-tuning of teachers' classroom activities.

Second, we find important variation in peer-rated teacher effectiveness. Each teacher was observed in the classroom and scored by a peer teacher, with scoring guided by a rubric which describes effective teaching. Peer observers might have been likely to simply rate everyone as “highly effective”, but in fact ratings from peer observers do vary, and more than those from the external trained observers in prior research. However, the ratings mostly do not reveal differences at the level of specific skills.

Observers rated teachers’ actions in ten different practices or skills, but these turn out to be highly correlated; in practice, then, the ratings mostly measure one general dimension of teaching effectiveness or quality. These ratings of teaching effectiveness also predict student test score outcomes. The average student will score 2-3 percentile points higher, by our estimates, when assigned to a teacher whose peers rate her among the top quartile.

Third, effective teaching, at least as measured by teachers’ ratings of their peers, matters less for relatively higher achieving students and classes. The benefit of a highly-effective teacher is actually three times larger for low ability than high ability students. This difference exists even between higher and lower achieving students who are in the same class with the same teacher.

Our results alone are not sufficient to make strong conclusions about cause and effect. Still, our analysis is designed to address several alternative explanations for the correlation between teaching practices and student test scores. To account for the sorting of students to teachers, we control for students’ prior scores, exposure to poverty, the prior achievement of their classmates, and school factors. To account for differences in observer behaviour, we use only within-observer between-teacher comparisons.

In looking at teaching practices, we control for rated effectiveness, so the estimated effect takes account of the skill of the teacher. In looking at teacher effectiveness, we control for teaching practices, so the estimated effect takes account of what the teacher does. The main remaining alternative explanation is differences between teachers that are unobserved, but only if those unobserved differences are correlated with our practices measures and correlated with student test scores. For example, we cannot control for a teacher’s content knowledge, and math teachers who devote more class time to direct instruction may have stronger math skills themselves.

Implications

A practical outcome of our project is to provide teachers and school leaders with further tools to improve teacher effectiveness, thereby enhancing their pupils' life chances. Our results on which teaching practices raise student achievement should also be of use to teacher educators, and to the institutions and governments that manage them.

One key point is that this is cheap and feasible: the process for a school to generate the required data is simple, cheap, administratively modest, and politically feasible. The observations are carried out by peer teachers, and our observers received little training, much less training than is often described as necessary for "reliable" observations. At least as important as our specific findings is the fact that teachers and schools need not rely on rules for "typical" or "average" teachers.

This project demonstrates the feasibility of measuring each individual teacher's practices and effectiveness, which can then inform individualized decisions about where to devote scarce time and energy.

First, these results can help inform teachers' own decisions and improvement efforts. For example, our results emphasize the importance of individual student practice for maths, and instead peer group work for English. Our results suggest the typical maths teacher should work on student practice, and on building related teaching skills.

A second potential use of these results is in assigning students to classes and teachers. Our finding is that lower-achieving students' GCSE scores appear to benefit more from highly-rated teachers than do higher-ability students. However, in our setting as elsewhere, we find the reverse is often true with lower-achieving students are less likely to be assigned to the highly-rated teachers. There are important gains to be made by schools re-thinking how their most effective teachers are allocated.

Third, our results have implications for schools' decisions about teacher hiring. One of the widely recognised issues in the teacher labour market is the lack of reliable pre-hire signals of teacher effectiveness for schools. This requires a prediction about that person's often-unobserved job performance, and our results suggest that feasible classroom observations can predict meaningful variation in teachers' contributions, and thus help inform personnel decisions. To be clear, our suggestion here is not that observation scores should mechanically or solely determine such decisions; rather the suggestion is that scored observations of teaching are a relatively low-cost way to gather useful information.

Finally, it is important to also emphasise that the students taught by the observers gain as much in terms of test scores as the students taught by the observed teachers. This opportunity for self-reflection for the observers is clearly valuable to them, and benefits their students.

View the full report here:

Characterising Effective Teaching full report



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