

TIME IN EDUCATION: INTRODUCTION*

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At first blush it seems almost silly to have a Feature on the impact of added time in instruction on student outcomes. After all, a higher dosage of teaching should obviously produce more learning. In reality, the prior research on this question has been quite inconclusive. This Feature, however, moves knowledge forward a considerable distance.

The two articles – by Victor Lavy and by Steven Rivkin and Jeffrey Schiman – advance our understanding in three different areas. First, the substantive conclusions about the positive impact of added time help to remove uncertainty about effects and provide direct policy guidance. Second, each of the articles addresses the methodological issues that have plagued prior research in a careful and thoughtful way. These ideas on approach go beyond just the evaluation of time use in the classroom. Third, by providing intriguing insights into variations of effects across countries, both underscore the value of comparative international studies.

The issue of instructional time has received policy attention over a long period. The initial impetus of this attention was the easily observed fact that the number of days of attendance per school year varied dramatically, ranging from 160 to 240. Subsequently, others noted that the length of the school day also varied dramatically, leading to a different picture of the amount of overall instructional time across countries. But, while counting contact time is relatively easy, understanding its impact is less so.

The analyses of Lavy and Rivkin–Shiman have a number of common features. Both employ the international PISA data: Lavy for 2006 and Rivkin–Shiman for 2009. Both make use of the variations in instructional time and performance found within individual schools. And both provide thorough discussions of the challenges faced in doing such empirical work.

The findings are quite consistent. Both show that added instructional time pays off in terms of student learning. Lavy does this by developing and implementing estimation based on student fixed effects where student achievement across different subjects is compared to time spent on each of these subjects. Rivkin–Shiman follow this tactic (albeit implemented in a different way) and compare this with the results of estimation based on performance comparisons across grades in a school but within subject.

The results of the two studies with respect to amount of weekly instructional time are consistent and quite precisely estimated. As such, they provide first-order policy information.

From the basic estimation of average effects, each pursues a series of added investigations, fanning out into different dimensions of potential heterogeneous

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effects. Lavy considers whether the effects look the same across countries at different levels of development. Here, it appears that time of instruction is more important in advanced countries as opposed to developing countries. Further, within developed countries, school-based accountability enhances the productivity of time.

Rivkin–Shiman look in different directions. Specifically, they stay at the more micro level and consider diminishing returns to added time (which seems to be present). Importantly, they also consider how time interacts with the quality of the classroom environment as measured by survey information about classroom disruptions, bullying, attendance and so forth. They show, perhaps not surprisingly, that more time is more productive in a good classroom environment than a poor environment.

These substantive findings are clearly of interest to education researchers and policy makers. But there is also another aspect of these articles that is of interest to a wider audience. Specifically, they show that methodology matters. Simple running an OLS regression of time on achievement while controlling for any number of other measured attributes does a very poor job of eliminating the inherent selection bias. The OLS estimates in both studies are two to three times larger than the better identified estimates that are their focus.

The better identified estimates that they provide come from a key insight in the work. Even though the PISA data come from a cross-section of students, they contain information that can be leveraged into better identification that lessens that chance of strong selection factors. Specifically, they use within-student information and within-school information in order to neutralise any potential impact of student selection into different school structures and of administrative decisions by the schools. While not foolproof, it is clear that they both have improved significantly on the cross-sectional OLS evidence that drove most prior discussions. Moreover, the approach of extracting ‘good variation’ from the cross-section undoubtedly has lessons for other analyses.

The third area of interest in these articles is developing (and advertising) the value of the ever-expanding amount of international data that are available. Even though there has been international achievement testing for a half century, it is only in the last few years that economists have begun to exploit these data (Hanushek and Woessmann 2011). Exploiting international data presents a number of challenges but also holds promise for providing new information that is difficult if not impossible to get from individual country data – as these articles demonstrate.

Perhaps the most important aspect of the international data is providing insights into the importance of various institutions. Even the best identified national study presents challenges when it comes to generalising from the results, because these national studies are imbedded within an institutional structure common to all of the observed schools. A key element of international studies is the ability to look across institutions. Lavy’s analysis shows directly, for example that the productivity of time varies by level of development. This finding in turn suggests that not all findings from developed countries will generalise to the policy situation in developing countries – and *vice versa*.

If one pursues thoughts of these institutional differences, one immediately sees that there is a lot of work remaining. Of course, truly good papers act to stimulate the thirst for further investigations – and these clearly do that. What is it about the institutional structure that matters? Or, related to the Rivkin–Shiman analysis, what elements of

classroom (and teacher) quality are most important to the productive use of time? For example, some of the productivity differences across schools and across countries may reflect variations in teacher quality that directly interact with instructional time. Or, in policy terms related to both papers, what is the cost of adding time to one subject area? These kinds of questions are just the tip of iceberg about issues inspired by these articles.

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Reference

Hanushek, E.A. and Woessmann, L. (2011). 'The economics of international differences in educational achievement,' in (E.A. Hanushek, S. Machin and L. Woessmann, eds.), *Handbook of the Economics of Education*, vol. 3, pp. 89–200, North Holland: Amsterdam.