

# OVERMATCHED AND OVERPERFORMING: THE POSSITIVE IMPACT OF STUDENTS' PLACEMENT IN LATE ELEMENTARY AND MIDDLE SCHOOL CLASSROOMS WHERE THEY OCCUPY THE BOTTOM OF THE DISTRIBUTION OF INITIAL KNOWLEDGE

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## *Background and Research Questions*

Classroom teachers often sight variation in classroom ability among their students as a major obstacle in the way of effective instruction, and policymakers have used this as justification for the tracking of students. However, this does nothing to deter parents from advocating for their child to be placement in the most advanced class available to them. This presents a set of compelling questions. Namely, are classroom teachers who claim that variability in the initial level of student knowledge have an independent negative effect on learning, net of the overall level of student knowledge? Do students who are overmatched, or placed in classrooms where they occupy the bottom of the distribution of initial content knowledge, benefit from such a placement and, if so, what are the mechanisms of such a benefit? It should be noted that these to ideas are not mutually exclusive, as it is entirely possible that overmatched students benefit from their placement, but this placement could have a negative externality for their classmates as a result of diverted teacher attention or some other factor.

## *Data*

In order to examine these questions, I use large-scale institutional data on primary school students from the Indiana Department of Education (IDOE) administrative data, which include data school, teacher, and student levels. The Indiana Statewide Testing for Educational Progress (ISTEP+) testing regiment, which is a No Child Left Behind-mandated standardized test taken by third through eighth grade students, takes place near the end of each school year. Relevant data for this project was collected annually from the 2010 academic year (AY) until the 2014 AY, and includes third through eighth grade students. In total, 1,963,766 cases of data were collected on 826,248 students. Student data is linked to the mathematics classroom where they were placed. Also, given that the IDOE provided each school's National Center for Education Statistics identification number, these data were linked to the Common Core of Data, which allowed analyses to include school-level variables. While charter, magnet, and private schools are included in these data, they are excluded from my analysis for the sake of simplicity.

## *Research Design*

I define any student who is more than one half of a standard deviation bellow the classroom median previous-spring math test score as being overmatched, which results in about 20% of students falling into this category. This definition allows for uneven distribution of overmatched students across different classrooms, and the result is that 17% of classrooms have no overmatched students and 56% have less than 5 overmatched students. I use hierarchical

linear models of spring math test scores with student fixed effects and in order to identify the effect of both individual student overmatching and classroom level variance in initial content knowledge. I also test for possible moderators for both relationships. This includes student ascriptive characteristics like race, gender, and socioeconomic status (measured using free- or reduced-price lunch status) and student's classroom behavior (measured using days suspended in a given year).

### *Preliminary Findings*

Preliminary analyses indicate that overmatched students experience a benefit as a result, net of other classroom characteristics and subject time-invariant characteristics, which are netted out though the use of student level fixed effects. Overall, overmatched students tend to perform .012 standard deviations higher on their spring math test than they otherwise would, and this benefit is greater for students in high-achieving classrooms. In a classroom one standard deviation above the mean in average previous-year scores, overmatched students are predicted to perform .028 standard deviations higher than they otherwise would. Additionally, this positive effect is entirely mediated by differences in days suspended, indicating that students either improve their classroom behavior as a result of overmatching or these classrooms are more tolerant of their misbehavior. However, race acts as a moderator of this relationship, and black and Latino students experience a small but significant negative effect as a result of being overmatched. Finally, initial analyses showed resulted in no evidence for an externalized negative effect of overmatching.

### *Conclusions*

The preliminary findings discussed here indicate the need for continuing investigation into student to classroom overmatching in the realm of primary education. These findings uphold the assumptions made by many parents – that students benefit from placement in the most advanced classroom available to them. In addition, while whether or not overmatching makes the task of classroom instruction more difficult is beyond the scope of this study, I find no evidence that it has a systematically negative effect of overall classroom learning. The exact manner in which overmatching has a positive effect on students cannot be identified using these data, but I would speculate that students benefit from a localized peer effect, were the majority of students either model or directly communicate positive behavioral norms to overmatched students, which leads to overmatched students practicing more attentive behavior and missing less school as a result. Whatever the case, this research indicates that further investigation is required in order to identify why it is that students benefit from placement in classroom that would seem at first to be overly difficult and an impediment to learning.