Classroom Assignment Practices in Urban School Districts Using Teacher Level Value-Added Systems

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Abstract

Recent econometric studies have begun to assess validity of value-added metrics in light of the non-random assignment of students to teachers. Value-added models (VAMs) assume student learning trajectories will remain the same across years, but students often experience changes that influence their learning. As a result, teachers' ratings may be affected by factors that are unrelated to classroom performance or teacher quality. The concern that teachers may be incorrectly assigned attribution to student performance is at the heart of high-stakes accountability reform criticisms. To further investigate this issue, we conducted qualitative, exploratory research to determine how students are assigned to teachers in K–8 schools across three large, urban school districts from the perspective of principals. Our preliminary findings indicate that most classroom assignment is indeed non-random. However, many schools engage in "balancing" practices in attempt to ensure that the students in classrooms are evenly distributed across classrooms within grades. Within the balancing structure, schools may also "match" particular students to specific teachers (or other students) based on pre-identified individual characteristics or interaction tendencies. Our results suggest that information on school assignment practices could compliment value-added validity verification and will also be used to build two systems to support the correct attribution of students to teachers.

Introduction and Background

A recent Economic Policy Institute Briefing Paper (Baker et al., 2010) presented a critique of value-added modeling (VAM). That critique asserted that VAM is not yet ready to be used in high-stakes decision making at the teacher level. The paper identified factors that may influence student test score gains, such as team teaching, class size, student mobility, and school

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scheduling practices. VAMs assume that students' growth trajectories will remain the same across years, but students often experience changes that influence their learning. As a result, the teachers' ratings may be affected by factors that are unrelated to teacher quality.

The Economic Policy Institute paper also highlighted the nonrandom assignment of students to teachers as a factor contributing to the unreliability of VAMs. One way to mitigate this factor is to assign students randomly to teachers; however some students benefit from an optimal match with a teacher (Hanushek, Kain, O'Brien, & Rivkin, 2005; Harris, 2008). For example, teachers who are thought to be particularly skilled in teaching reading may be matched to students who need extra reading help. Or, students who are known to create problems together may be intentionally assigned to different classrooms.

Prior research has also indicated that student outcomes may vary due to the systematic assignment of students to teachers. Rothstein (2009) conducted research that showed that future teaching assignments have predictive power over current student performance in VAM even though future teachers cannot have causal effects on current teacher performance. These results suggested the student-teacher sorting bias is not ameliorated by the value-added approach. Kodel and Betts (2011) extended Rothstein's analysis by testing the reliability of VAMs using multiple years of data (Rothstein used a single year of data for each teacher) and a different dataset. They found that VAMs that focus on single-year teacher effects will generally produce biased estimates of value added, but when they estimated a detailed VAM and restricted their analysis to teachers who teach multiple classrooms of students they found no sorting bias in the estimated teacher effects. Neither analysis uncovered a well-defined set of conditions that describe how the school environment or other input factors affects student attribution to teachers or classrooms. These input factors are termed "unobservables" in VAMs. Some research has explored the influence of specific unobservables in the assignment of specific students to specific teachers, such parental requests for teachers (Jacob & Lefgren, 2007).

Our study's aim was to uncover a preliminary set of unobservable characteristics in assignment and matching practices in classrooms and schools. Classroom assignment is a school practice that encompasses how classrooms are composed of students and which teachers are assigned to which classrooms. "Matching" may also be a practice that is part of the assignment process. Matching refers to the unique pairing (or splitting) of teachers to students and/or

students to students. We explored the facets of assignment and matching across three levels: classroom composition of students, matching students to teachers, and matching students to students. From a value-added modeling perspective, it is important to understand the systematic differences in students' potential outcomes across teachers and classrooms.

Our research study considers three questions:

1. How are classrooms organized for assignment and matching?
2. What are the individual attributes of teachers and students that determine classroom assignment and matching?
3. What are the various processes and other school-level factors that comprise assignment and matching practices in schools?

Methods

The study adopted an exploratory approach and used a field-based, qualitative design. We partnered with Chicago Public Schools (CPS), Milwaukee Public Schools (MPS), and Racine Unified School District (RUSD). In CPS, we conducted focus groups with Chicago TAP principals (Teacher Incentive Fund project) in November 2008. Fourteen principals participated in the three focus group sessions; two groups consisted of five principals each and one group consisted of four principals. Two moderators conducted each focus group from the University of Wisconsin-Madison research team. A range of schools were represented: 13 elementary and middle schools, one high school, and one charter/non-union elementary school. This data was collected on November 3, 2008, during a Chicago TAP program meeting at district offices. Each focus group session was conducted in a private, closed conference room and lasted approximately 60 minutes. The focus groups were semi-structured and consisted of the research questions followed by a set of probes. Each focus group had 1 moderator and 1 note-taker. The notes were individually transcribed to electronic files and stripped of identifying information.

In MPS, we interviewed principals and Administrative Specialists, who were former principals who held district-level administration positions. The school study consisted of a cross-case analysis of eight schools, composed of eight one-hour, on-site, semi-structured interviews with principals, held April-June 2010, and five one-hour semi-structured interviews with Administrative Specialists (former principals) held in June 2009 at the district level. Each

interview was audio-recorded with permission and transcribed into an electronic document format. We constrained our sample to eight K-8 schools and did not include high schools in this study. High schools have a different classroom assignment structure that is usually based on course assignment and scheduling constraints.

The school sampling frame consisted of a comparison of value-added and attainment scores. We defined performance at the school level via value-added analysis (VA). MPS uses attainment scores on the state test to designate schools as high- or low-performing. To address this difference, we used a comparison of VA and attainment measures to select eight schools across four performance levels (two schools in each performance category): high VA/high attainment, high VA/low attainment, low VA/high attainment, and low VA/low attainment.

We interviewed eight principals in RUSD. We used the same sampling frame that we used for the selection of MPS schools, using a comparison of VA and attainment schools to select two schools within each of the four performance categories. These interviews used the same semi-structured interview protocol, based on the three research questions and probes. The interviews were conducted on the phone and audio-recorded with participants' permission using a professional telecommunications service. Each interview lasted approximately 60 minutes. The audio files were transcribed into electronic documents.

We performed a qualitative content analysis on the data set using QSR NVivo 8 , a qualitative analysis software package, to organize the themes and code responses. The transcribed documents from the interviews and focus groups were loaded into NVivo and the analyst coded the documents into themes and categories. The thematic coding structure consisted of an *a priori* skeleton structure based on the three research questions and probes. One researcher coded the responses and the other performed inter-rater reliability tests by coding transcripts and making cross-case analyses of the categories and coding created by another researcher (Sara Kraemer and Robin Worth). The differences in coding consisted of clarifications in definitions within the coding structure.

Results

The results report a summative view of assignment and matching practices across the three school districts.

Research Question #1: How are classrooms organized for assignment and matching?

Schools in our study tended to organize their classrooms into a heterogeneous design. The heterogeneous design refers to schools' efforts to balance classrooms with an equal mix of student attributes (e.g., high-, medium-, low-performing students, gender, and race; see Research Question #2) across classrooms within grades. The heterogeneous classroom design reflects the current trend in education toward differentiated instruction and an aim to be equitable to teachers. A less frequently used design was the "homogeneous" classroom, which refers to a classroom that contains the same or similar type of students (e.g., high- or low-performing students). Within all schools or past principal experiences, classroom assignment embedded special education students within the heterogeneous classroom structure. Schools also utilized unique and infrequently used classroom designs such as looping (teacher follows student class for multiple years) and split classrooms (teaching two grades within one classroom).

Matching (or splitting) students to teachers or students to students occurred in some capacity within each school or previous leadership experience. In general, the practice of matching within classroom assignment was less frequently utilized than general classroom assignment approaches, although some schools matched each student to the teachers. Some students requested teachers, and these requests were usually granted if the school's policy honors student input. Splitting students from students occurred among family members in a school or when there was a prior history of problems between students. Splitting students from teachers usually occurred when there are difficulties in managing the family relationships between teachers and students' parents or when there were one-on-one problems between the teacher and student.

Student mobility was also a factor in classroom assignment. Since student information and history are usually not available when the student arrives at a school (and classroom assignment has already been completed for that year), mobile students (i.e., students that arrive from a different school early or mid-year) are usually assigned to classrooms with open seats. While the aim of placing mobile students is to keep the classrooms evenly distributed, it is not always possible to place the student within the school's classroom assignment approach (due to full classrooms or lack of student information). Accurately tracking student mobility is a critical factor in schools that have high turnovers of both students and teachers. Capturing the

assignment of students in classrooms that change in student and teacher composition also illuminates important data quality challenges for value-added metrics; getting the student-teacher linkages correct is essential for valid and reliable classroom value-added metrics. Data quality presents challenges at the school level (entering in new students and changing information about student assignment) and at the district level (technology capable of capturing the nuance and frequency of change within the student information and human resource information technology systems).

Principals and former principals also cited team teaching as important in classroom design; multi-teacher teams in some capacity occurred within each school or principal leadership experience. Team teaching could occur with special education teachers, those with other specialties, or within specific disciplines (i.e., reading, math, science). Most teams teach across classrooms within grades.

Research Question #2: What are the individual attributes of teachers and students that determine classroom assignment and matching?

Student attributes were grouped into three areas: academic performance, student demographics, and individual characteristics. Within the academic performance category, students may be assigned to classrooms based on their ability level in key content areas (i.e., reading, math), their achievement scores on the state test or other locally developed assessments, special or 'elective' classes or courses (this occurred within large schools that had a hybrid elementary-junior high school model), gifted or talented designations, special education status, and whether or not the student repeated grades or classes. Within student demographics, the most frequently cited demographic categories in our study included ethnicity, gender, and primary language (e.g., Spanish versus English speakers). Individual student characteristics consisted of disruptive behavior and/or social problems, student personality, student presence (e.g., whether or not a student could be physically intimidating), and the need to separate individuals based on intrinsic differences that clash between the students.

Teacher attributes were grouped among three categories: teacher skills, demographics, and teaching style. Teacher skills consisted of ability to teach various student age groups, skill at teaching high performing students, and teachers that tended to produce high test scores in their

classrooms. There were less definitive responses among the descriptions of teacher skills, including the observation that some teachers "just seem to be more effective" than other teachers and that some teachers have the ability to teach any student well, regardless of specific individual student attributes or characteristics. The teacher demographic category included: type of teaching experience (e.g., specific curriculum, grade level), gender, new versus experienced teacher, and certification or licensure status. The last category, teaching style, included strong classroom management and structure (most frequently cited), nurturing approaches, and personality.

Principals and Administrative Specialists described these attributes as the basis for assignment and matching decisions. That is, they most frequently cited these categories to compose classrooms and assign students to teachers. Some of these attributes are currently captured by the MPS value-added system, such as academic performance (as measured by the state test), gender, socioeconomic status, and race. Other attributes are not measured by data points that could be used within the value-added system, but were cited as relevant to the overall classroom performance including "softer" measures such as personality, learning or teaching style, and classroom management approach.

Research Question #3: What are the various processes and school-level factors that comprise assignment and matching practices in schools?

Overall, the processes and organizational structure used in schools are multi-dimensional and complex. Schools use a range of approaches, artifacts, and levels of school personnel involvement in their assignment strategies within schools. We found that most schools had an established approach to assignment that had been in place for several years or more and cited their assignment framework or approach as flexible to meet current year needs. Current and former principals also cited their leadership style as a key factor in how classroom assignment occurred within their schools; some principals took a more integrated or "hands-on" approach, while other schools were more teacher-led. This appeared to be tied to the school culture and level of overall congeniality among school staff. Schools that had experienced teachers with a track record of working together tended to lead assignment and matching practices in schools. Other schools used a principal-teacher hybrid approach, in which both teachers and principals provided input to assignment and matching and also engaged in the process. Most of these

processes occurred within a team-based design (two or more people, sometimes as many as ten or more).

Many stakeholder groups also provided input for classroom assignment and matching. Whether or not a stakeholder group is included in the input process of assignment is usually established as a "known" rule within the school. For example, most principals have established guidelines on whether or not to allow parental input for student assignment and those guidelines tend to be all or nothing. That is, parental input is uniformly not allowed at all or it is allowed and school leaders do their best to accommodate parent requests. Again, these guidelines are usually tied to school culture, context, and whether or not there were problems associated with parental input in the past. Teacher input is usually encouraged or even required, although the form of input varied from school to school. Most schools have a paper-based system (e.g., "teacher request forms") to collect information about what grades, classrooms, and/or students they prefer to teach the following year, while a smaller proportion of schools may meet one-on-one with teachers to get a sense of their classroom preferences (this tends to be with smaller schools). Other stakeholder groups include the special education teachers, curriculum specialists, literacy coaches, scheduling specialists (if that role exists in schools), school secretaries, and program implementers.

Schools used tools, technologies, and artifacts to support the assignment and matching process. Although most of the tools they use are paper-based, they do access the district data warehouse to download student achievement scores and, in some cases, value-added analyses to determine student academic achievement. Many schools use index cards to capture student information; they typically use different colors (one color for females, another for males) and write student-specific information on the card (e.g., academic performance, special education status, other individual characteristics specific to the school's classroom assignment goals). At the school-level meeting(s) for assignment, the cards are typically used to sort out students within the classrooms, which assist the teams in visualizing the classroom composition. The teams or individuals may use printouts from the data warehouse system to supplement the other paper-based tools they use for classroom assignment, such as classroom lists or school surveys. One school used the student information system for scheduling classes; however, this was a large middle school and had adapted a high school scheduling model. Even so, school administration

would then go through the scheduling analysis and make changes based on stakeholder input or personal knowledge of potential problems (e.g., poor behavioral or personality match between teacher and student or student and student).

We found that school or district environment factors may affect how classroom assignment is conducted at schools. Teacher labor issues constitute one such example; these issues may include a teacher shortage based on school or district budget cuts, losing teachers to low student enrollment, re-hiring teachers at the start of the school year, high teacher mobility (from school-to-school), teacher unions, teacher seniority issues (some school cultures or practices may favor more senior teachers by giving them more agreeable students or classrooms), and teacher allocation for special education students. School types may also affect how students are assigned to teachers or classrooms; these types include school size, charter or magnet school designation, high school (differences as explained in the Methods section), and middle schools

Discussion

This study provides a preliminary description of how schools assign students to classrooms and match students to teachers, as well as identifying some potential student and teacher characteristics that may be used in the assignment process. Our findings suggest that assignment and matching is a complex, intentional process within schools and involves an understanding of student and teacher characteristics that have not yet been codified for VAM. The aims for our next steps are to further develop, refine, and validate the attribution classification system that we have begun to develop in this exploratory study.

The classification system will be used to validate classroom VAM, which includes developing two attribution systems to be implemented and used in conjunction with classroom-level value-added metrics. We are currently developing two mixed-methods research projects based on the findings of this study; these studies will develop attribution systems. First, we will return to urban K–8 schools to ask about student-specific assignment to classrooms or matches to teachers. In this study, we will ask about specific students and why they were assigned to specific teachers. We will use the class roster from a sample of classrooms and ask those teachers and school leaders involved in the assignment process how and why they assigned each student to a classroom or matched a particular student to a specific teacher. The purposes of this project are to gain an understanding of the frequency of specific matches versus assignment to a

classroom (heterogeneous, homogeneous?), verify that the individual characteristics we identified in the current study are replicated, and identify any additional characteristics.

This information will be used to create an electronic, web-based attribution system that will be used in conjunction with our Student-Teacher Verification System. The attribution system would be implemented post-assignment in schools (usually in April–June) and those who were involved in the process would assign attribution to students and teachers based upon their completed classroom assignments. The attribution system would include individual characteristics of students (e.g., achievement results, gender, personality) and teachers (e.g., classroom management style, gender, leadership style, tenure) and link how those characteristics resulted in a classroom assignment (e.g., homogeneous, heterogeneous, mixed classrooms) or unique match (e.g., matching or splitting of students/teachers or students/students).

The second research project would include developing a survey to assess assignment practices for schools. The purpose of developing the survey would be to obtain a description of the types of assignment and matching that occur within that school. This information would then be used to interpret the value-added measures within each school (e.g., identify the type of school that may load disruptive, problematic, or low-performing students to a single teacher or small group of teachers). The surveys will be crafted for specific user groups within each school: principals, teachers, and school administration staff. The purposes of these surveys will be to: (a) obtain a description of the overall assignment process in schools, and (b) triangulate the perspectives of the assignment process. For example, do principals and teachers view the process of assignment in the same way? In schools with a low level of staff cohesion or collaboration, do some teachers disproportionately receive the difficult-to-teach students in their classrooms? This information would then be used to interpret the value-added measures within each school (e.g., identify the type of school that may load disruptive, problematic, or low-performing students to a single teacher or small group of teachers). The survey is an essential data collection tool to obtain the perspective of principals, teachers, and school staff anonymously; we would not necessarily obtain all assignment practices in face-to-face interviews, focus groups, or an electronic attribution system.

Conclusion

The accurate assessment of assignment and matching practices in schools and their relationship to classroom-level value-added becomes even more critical once performance ratings are used in high-stakes accountability systems, such as differentiated educator compensation systems. This threat to value-added model validity was our primary motivation for carrying out this study. It is critically important that any value-added system that we build is respectful to teachers. In order to build such models, we need to demonstrate that we understand the school context accurately.

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