A Framework for a Taxonomy of Schools

Going Beyond Governance-Based Categories when Evaluating and Comparing Schools

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ABSTRACT

Given the current focus on school evaluation and accountability, it is vitally important to capture those differences among schools that can be expected to contribute to student success as measured by students' behavioral, emotional, and academic outcomes. The current practice of comparing "district" and "charter" schools, for example, or "public" and "private" schools, obscures the more important differences that such schools may have and does not provide a basis for substantive conclusions.

To truly understand school differences, we must go beyond the surface of simple governance issues to consider how, at a deeper level, schools differ from one another. This paper presents the results from an extensive review of schools (district, chartered, and private) and the school effectiveness research. Potentially important differences among schools are highlighted and the implications of these findings are discussed.

TABLE OF CONTENTS

Introduction

Background

In recent years, educational researchers interested in comparing schools have conducted studies aimed at establishing whether certain types of schools are beneficial in terms of students' behavioral, motivational or academic outcomes. Unfortunately, the vast majority of these studies base their comparisons upon school governance (e.g., "charter vs. district", or "public vs. private"). This sort of approach is seen in a set of articles in the Fall 2005 issue of Education Next (www.educationnext.org), in which chartered and district-run schools are compared with little consideration of how the schools themselves actually differ (e.g., Bifulco & Ladd, 2005; Hoxby & Rockoff, 2005). In one example, it is only noted that the chartered schools "feature a structured school day and curriculum, combined with a family-oriented approach designed to get parents involved" (Hoxby & Rockoff, 2005, p. 53). This approach does not take into account differences in schools' structure and operation, and, as a result, it is difficult to draw lessons from this research that would enlighten public policy or guide school reform efforts. Unfortunately, much of the current educational research on the chartering phenomenon suffers from this weakness (e.g., Greene, Foster, & Winters, 2003; Schneider, Buckley, & Kúcsová, 2003; Solmon & Goldschmidt, 2004). Some researchers have identified this issue and hinted at solutions (e.g., Gill, Timpane, Ross, & Brewer, 2001; Zimmer et al., 2003), but thus far, no definitive action as been taken.

When evaluating schools, we must go beyond the surface of simple jurisdictional labels to consider how, at a deeper level, schools differ from one another. Even a brief review of the various types of schools around the country would reveal significant differences in learning models, administration, facilities and resources, especially when examining secondary schools. Rather than being a basis for comparing schools, chartering or private schooling are only the mechanisms that enable educational innovation to arise. It is the innovations, not the mode of governance, which should be the target of our research efforts. To do this, a more detailed categorization scheme for schools is required.

Purpose

Our purpose is to develop a more detailed classification system for schools (a "taxonomy of schools", similar to the taxonomical systems that are used to classify the earth's flora and fauna, for example). The first step in this process is the development of a descriptive framework that captures the key structural and operational differences among schools that are anticipated to impact student outcomes. This paper represents our work thus far on this critical first step.

Our goal with the initial descriptive framework is to encompass all of the key characteristics of schools that could potentially impact student performance. We also intend for it to be relatively straightforward for a school leader or observer to objectively evaluate a school according to this framework, in that no complex estimating or analysis should be required and no subjective opinions should be necessary. The key characteristics of schools should be those that are accessible to the levers of educational policy, and should be measurable with one or more dichotomous, categorical, or quantitative variables. Finally, the variables in this framework should be orthogonal, to eliminate duplication in measurement. Although this last goal may not be attainable, that should not prevent us from using it to guide the development of our framework.

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This framework is not a classification scheme for schools in and of itself. Rather, it is merely the first step in the process of developing such a classification. Subsequent steps include (1) the measurement of a large number of schools using the variables from this framework, and then (2) subjecting the resulting dataset to cluster analysis, which will group the schools according to their similarities. From this, the taxonomy will arise empirically (Bailey, 1994). A taxonomy created in this fashion will be empirical, in contrast to current efforts that rely on theory or supposition.

School effectiveness

A great deal of existing research on school effectiveness has been done, and some of it is cited in this paper. As useful as this research may be, the various differences between schools are generally analyzed in isolation from one another, preventing an integration of knowledge. With a taxonomy, the differences between schools can be examined in a broader context, either by comparing across taxonomical categories or by analyzing subtle variations within categories.

It should be noted that the extant research cited in this paper has produced a staggering number of variables with which to measure and evaluate schools. It follows that a taxonomical system, which is by definition a form of data reduction, would bring needed clarity to the field. In the development of this taxonomy, our task is to identify those fundamental variables that should form the basis for the taxonomy and those that simply represent minor variations within taxonomical categories.

Scope of work

When discussing the evaluation and comparison of "schools", we should be clear on what defines a "school". For our purposes, a school is defined as any organized, long-term program of learning activities made available to a broad population of children and adolescents. This definition could include everything from large comprehensive high schools to small, personalized charter schools to virtual schools in which the only connection between students and teachers is via the Internet. Our framework is intended to include both public and private schools, but is not intended to include homeschooling, which is generally less organized than formal schooling and not made available to a broad population. Finally, our focus in this project is

on secondary schools, given that we expect most of the variation among schools to be found at the secondary school level. Variation does exist at the primary school level, but many of these schools fall into fairly well-defined categories. For example, many elementary schools choose to implement a set curriculum across the school (e.g., Open Court, Houghton Mifflin, etc.) or follow a set philosophy (e.g., Montessori, Waldorf, Individually Guided Education, etc.).

The variables in this framework have come from a variety of sources. Some have been part of the empirical literature for some time (and if so, the corresponding references will be noted). Other variables were derived from school visits, in which new innovations or ideas were observed. It should be emphasized that these variables are meant to represent variation at the school level. In other words, they are meant to be structural and organizational qualities of schools that are implemented in a more or less consistent fashion throughout the school. Classroom-level variations, such as a teacher's personal instructional techniques (e.g., lecture vs. hands-on activities), or the nature of a teacher's assessment practices (e.g., multiple-choice vs. essay questions), are beyond the scope of this project.

In addition, student characteristics, such as age, gender, ethnicity, socio-economic status, and special education status are extremely important and have been shown to have a significant impact on school success; however, we do not consider them to be part of a school's structure or operation and thus they are outside the scope of this framework. Instead, we believe that student characteristics will likely interact with the variables in this framework in ways that are deserving of further research. In other words, student characteristics will likely "moderate" the impact of the variables in the framework on school success. Thus, the goal of our overall research effort is to discover not only "what works" in terms of school features, but also "for whom".

Descriptive Framework

Our descriptive framework includes a series of school characteristics that fall into three broad categories: (1) learning model, (2) administration, and (3) facilities and resources. There are also aspects of this framework that are (4) not yet included. Either these are difficult to measure according to what we currently understand or we may be undecided about whether the characteristic is inside or outside of our scope.

For each of each of these four categories we provide below an overall description of the category, a set of subcategories within that category, and a table of specific variables within each subcategory.

Learning Model

These characteristics refer to the learning program in the school, which can have perhaps the most direct impact on student achievement. The chartered school phenomenon has introduced a great deal of variation into learning models, although a chartered school by no means can be assumed to be different from a traditional district-run school. At the same time, many district-run schools are experimenting with alternative pedagogies. As a result, when comparing schools, it is vitally important to capture the difference in learning models.

Curriculum

Curricula can vary significantly from school to school. Some, such as the KIPP schools, are highly structured, constrained, and cohort-paced with no integrative themes. Others, such as the Big Picture Company schools, are mostly open, with a differentiated course offering, an individual pace, and an individual learning plan for each student. When examining in the differences among schools, this is perhaps the most important set of variables to capture. The variables are presented below in Table 1.

Table 1	Curriculum-related Variables		
Name	**Variable Type**	**Description**	**Relevant References**
Amount of Structure	Categorical	• Highly structured: exclusively course-based following a set curriculum • Somewhat structured: mostly or all course-based, but course formats permit student to execute some disciplinary projects; or, school requires a senior project • Mixed: students spend some time in classes and some time working on interdisciplinary projects (note: the ratio of time in classes to time in projects may change as students get older) • Mostly open: most learning is based upon interdisciplinary projects, with courses provided as needed	Blumenfeld et al., 1991; Brown, Collins, & Duguid, 1989; Dochy, Segers, Van den Bossche, & Gijbels, 2003

Course Offerings	Dichotomous	• Differentiated: school makes an effort to offer a wide variety of coursework to suit individual skill levels and interests • Constrained: school deliberately limits the number of course offerings to ensure that all students are exposed to the same curriculum	Lee, Chow-Hoy, Burkam, Geverdt, & Smerdon, 1998
Authentic Pedagogy	Dichotomous	• Yes: A concerted effort is made at the school level to design and implement an authentic pedagogy • No: No effort is made at the school level	Newmann, Bryk, & Nagao-ka, 2001
Common Planning Time	Quantitative	The amount of collaborative planning time for school staff per week	Louis, Marks, & Kruse, 1996
Curricular Themes	Dichotomous	• Yes: school makes use of school-wide curricular themes under which traditional subjects can be integrated; these themes could be centered around performing arts or have a cultural focus (e.g., dance, music, Latino culture, etc.) • No: school-wide themes are not used	
Individual Learning Plan	Dichotomous	• Yes: each student has own individual learning plan or something akin to it that is regularly reviewed and updated with students personal goals • No: no formal mechanism for the development and review of individual-level learning plans	
Pace	Dichotomous	• Cohort: Students proceed through school at the same pace, as a cohort • Individual: Students are permitted to work at their own pace and only advance when they have completed the required work	

Assessment of Learning

Many different types of assessment practices can be found in different schools. In most traditional schools, grades and teacher–created tests are the final measure of student learning, while many project–based schools offer grades as an option, with most assessment done via student performance (i.e., presentation, live experiment, etc.). These performance assessments can be related to a specific task or project, or they can be done periodically to assess the overall progress of student learning (e.g., the "TPOL" at High Tech High in San Diego and Redwood City, CA).

In some cases, grades are assigned but not shared with the student (e.g., Urban Academy in San Francisco, CA); grades are only shared with the student when they begin applying to post–secondary education. Finally, many schools now include self–reflection as an important part of student assessment. The variables are presented below in Table 2.

Table 2	Assessment–related Variables		
Name	**Variable Type**	**Description**	**Relevant References**
Grades	Categorical	· Optional: grades can be provided if the student desires them · Secret: grades are used but are not shared with the student until they leave the school · Shared: grades are assigned and are shared with the student periodically	Covington, 2000; Elliot & Dweck, 1988
Performance Assessments	Categorical	· Task–related: performance assessments are used to assess student learning in conjunction with a learning task · Periodic: performance assessments are used periodically (e.g., yearly) to assess the overall progress of student learning · No: performance assessments are not used	Wiggins, 1998
Student Reflection	Dichotomous	· Yes: student self-evaluation or reflection are part of the assessment process · No: teacher is only evaluator of student learning	Gamwell, 2005; Marchel, 2004

Place and Time

Although many schools conduct all learning activities on-site, other schools permit students to engage in learning activities at home for some or most of the week. These in-home activities are often facilitated by some form of communications technology, particularly the Internet. Schools may also include a service or internship component in their learning model. In this case, students spend some time during the school week off-site at a place of business, during which time they can gain experience and insight into certain fields of work. Determining the amount of time students spend in different locations during an average week is vital to understanding how a school functions.

In addition, while many district-run schools have a standard length to the school day and year, some schools have implemented either longer school days or included more days in the school year, or both. At the same time, the daily schedule of a school can be structured (i.e., standard-length classes or block scheduling) or open (i.e., no set schedule). The variables are presented below in Table 3.

Table 3   Place-and-Time-related Variables

Name	Variable Type	Description	Relevant References
Place	Quantitative (3)	1. On-site: percent time students spend at the school 2. At home: percent time students spend at home 3. Service Learning: percent time students spend at a school-approved service learning or internship site	Calabrese & Schumer, 1986; Hamilton & Fenzel, 1988; Yates & Youniss, 1996
Learning Time	Quantitative (2)	1. Hours per school week 2. Weeks per school year	Caldwell, Huitt, & Graeber, 1982
Daily Schedule	Categorical	• Set schedule/standard class periods • Set schedule/block scheduling • Open schedule/set hours • Open schedule/variable hours	Dexter, Tai, & Sadler, 2006; Lawrence & McPherson, 2000; Nichols, 2005

Teacher-to-student Programs

These innovations don't directly impact the learning environment, but do impact the relationship between teachers and students, which can then impact student performance (Connell & Wellborn, 1991; Goodenow, 1993; Ryan & Grolnick, 1986; Ryan, Stiller, & Lynch, 1994; Voelkl, 1995; Wentzel, 1994, 1997, 1998).

One example, known as advisory grouping, assigns students to an advisor upon entry to a school and the students meet periodically with that advisor throughout their time in school. Each teacher in the school acts as an advisor and is responsible for anywhere from 10 to 18 or more students. This practice can also be known as a "long-term homeroom".

If it exists, the advisory group can be somewhat peripheral to the learning environment, in which case a student may meet with their advisor once or twice a week, or the advisory group can be the basis for all activities in school. In the latter case, a student may spend most or all of their time working in their advisory group.

Looping also provides an opportunity for the development of positive relationships between teachers and students, but involves the scheduling of classes such that a teacher will have a particular group of students for more than one year. The variables are presented below in Table 4.

Table 4	Teacher-to-Student-related Variables		
Name	Variable Type	Description	Relevant References
Advisory Grouping	Categorical	• None: school does not use advisory grouping • Limited: school does use advisory grouping, but students only meet in their advisory once or twice a week • Extensive: students spend a majority of their time working with their advisor or in their advisory group	Lee & Smith, 1995; MacIver & Epstein, 1991; Newell, 2003
Looping	Dichotomous	• Yes: school uses looping • No: school does not use looping	Yamauchi, 2003

Student-to-student Programs

Some schools have implemented programs targeted at improving peer relations in school or raising test scores, or both. Example programs could include a student tutoring program, a mentoring program between older and younger students, or a conflict resolution program. The variables are presented below in Table 5.

Table 5	Student–to–Student–related Variables		
Name	**Variable Type**	**Description**	**Relevant References**
Student Tutoring Program	Dichotomous	• Yes: School officially organizes a student tutoring program • No: no tutoring program	Abbott, Greenwood, Buzhardt, & Tapia, 2006; Heron, Villareal, Yao, Christianson, & Heron, 2006; Maheady, Mallette, & Harper, 2006; McMaster, Fuchs, & Fuchs, 2006
Student Mentoring Program	Dichotomous	• Yes: School officially organizes a student mentoring program or buddy system • No: no tutoring program or buddy system	Hektner, August, & Realmuto, 2003 (elementary school); Lane-Garon & Richardson, 2003 (elementary school)
Student Conflict Resolution Program	Dichotomous	• Yes: School officially organizes a student conflict resolution program • No: no conflict resolution program	Stevahn, Johnson, Johnson, Green, & Laginski, 1997; Stevahn, Johnson, Johnson, & Real, 1996

Other Variables

Learning-related variables that are sometimes used in school evaluation include the availability of Advanced Placement (AP) courses and/or International Baccalaureate (IB) certification, whether ability grouping or tracking is used, whether cooperative learning is adopted as part of the learning model, whether the curriculum has a central focus of some kind (e.g., culture or arts), how teachers are addressed (i.e., first vs. last name), and whether instruction is provided in multiple languages. The variables are presented below in Table 6.

Table 6	Other Learning–related Variables		
Name	Variable Type	Description	Relevant References
AP/IB Offerings	Quantitative (2)	1. AP: the number of AP classes available at the school 2. IB: the number of IB classes available at the school	Shaunessy, Suldo, Hardesty, & Shaffer, 2006
Ability Grouping	Dichotomous	· Yes: school makes use of ability grouping or tracking · No: ability grouping is not used	Gamoran, 1992; Hallinan, 1994; Mulkey, Catsambis, Steelman, & Crain, 2005
Cooperative Learning	Dichotomous	· Yes: school formally adopts cooperative learning as an integral part of the learning model · No: no formal adoption of cooperative learning	DeVries & Slavin, 1978; Johnson, Johnson, & Holubec, 1984; Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; Sharan & Shaulov, 1990; Slavin, 1977
Arts Focus	Dichotomous	· Yes: school formally adopts an arts focus within the curriculum · No: no formal focus on the arts in the curriculum	Gamwell, 2005
Cultural Focus	Dichotomous	· Yes: school formally adopts a cultural focus within the curriculum · No: no formal focus on culture in the curriculum	
Multi-lingualism	Dichotomous	· Yes: school provides instruction in multiple languages · No: instruction only provided in English	Martin, 1997; Schechter & Cummins, 2003

Administration

These characteristics refer to the way in which the school is run on a day-to-day or year-to-year basis (i.e., who makes decisions, what type of decisions, and who is involved in the decision-making process). As with learning models, the chartered school phenomenon has introduced a great deal of variation into school administration. These variables can have a strong impact on the role of the teacher in the school, the composition of the school staff, and student attitudes about the school.

School Management

District-run schools are generally under the control of district personnel. Mandates regarding curriculum, personnel, scheduling, and finances are often given to the school by the district. Charter schools, on the other hand, are generally autonomous in their operations and have wide-ranging control over their school operations.

One exception to this is chartered schools that are set up as district instrumentalities. In some cases, these schools are given complete decision-making authority at the school level, but in other cases these instrumentality schools are more like traditional district-run schools in that they have little or no autonomy. A situation may also exist in which some school-level decision-making is allowed but only within the confines presented by the school district.

Another exception may arise in conjunction with Education Management Organizations (EMO's). Different EMO's allocate differing levels of decision-making authority to their schools, with some EMO's managing their schools closely and others only providing peripheral supervision. Capturing the level at which important decisions are made (i.e., inside or outside the school, or some combination of the two) and the nature of any external affiliations is vital to understanding how a school functions.

Within the school, many district-run schools have a principal, either dedicated to that school or, in the case of small rural schools, shared among several schools. Some newer schools, in contrast, do not have a principal and are managed by the collaborative effort of the teachers (Education|Evolving, 2006). This type of management model has been labeled "Teacher in Professional Practice" or "TPP". In this model, the teachers as a group have responsibility for hiring and firing staff, managing the budget, and determining the school's pedagogy.

In situations where the school is led by a principal who has authority over staffing and budget affairs, there may also exist a senior teacher who has authority over the learning model and curriculum. In most cases, this senior teacher is subordinate to the principal, but occasionally this situation is reversed. The variables are presented below in Table 7.

Table 7	School Management–related Variables		
Name	Variable Type	Description	Relevant References
External Affiliation	Categorical	• Independent: school has no external affiliations • District: school is affiliated with a school district • Non-profit: school is affiliated with a non-profit institution • For-profit: school is affiliated with a for-profit institution	Brown, Henig, Lacireno-Paquet, & Holyoke, 2004; Christman, Gold, & Herold, 2006; Lacireno-Paquet, Holyoke, Henig, & Moser, 2002
School Autonomy	Dichotomous (3)	1. Budget: whether final decision-making authority regarding school budget resides within or outside of the school 2. Pedagogy/curriculum: whether final decision-making authority regarding pedagogical practice and curriculum resides within or outside of the school 3. Staffing: whether final decision-making authority regarding staffing resides within or outside of the school	
School Leadership	Categorical	• Administrator-dominant: school is led by a principal, who has decision-making authority in all matters including instruction • Administrator-dominant with senior teacher(s): school is led by a principal, but pedagogy/curriculum is managed by a senior teacher or group of teachers • Distributed leadership: school is led by a principal, but many decisions (curriculum, budget) are delegated to teachers • Senior teacher with administrator: Senior teacher has decision-making authority for all matters, but has subordinate administrator • Teacher professional practice: school is led by the teachers, who as a group have full responsibility for the school	Education|Evolving, 2006; Spillane & Camburn, 2006; Spillane, Halverson, & Diamond, 2004

Teacher Development

Many school leaders believe that the quality of the teaching staff is the most important factor in the success of the school. Activities that promote the development of school staff can lead to more positive student outcomes. The variables are presented below in Table 8.

Table 8 Teacher Development–related Variables			
Name	**Variable Type**	**Description**	**Relevant References**
Professional Development	Quantitative/ Dichotomous (6)	1. Reform vs. traditional: the format of the development program 2. Duration: total number of contact hours and time-frame for program 3. Collective participation: whether groups of teachers from the same school, department, or grade level participate in development activities at the same time 4. Active learning: whether the development program provides the opportunity for active engagement in learning 5. Coherence: whether the development activity incorporates experiences that are consistent with teachers' goals and aligned with state standards 6. Content focus: whether the development activity is focused on deepening teachers' content knowledge	Desimone, Porter, Garet, Yoon, & Birman, 2002; Garet, Porter, Desimone, Birman, & Yoon, 2001; Odden, Archibald, Fermanich, & Gallagher, 2002
Coaching/ Mentoring Program	Dichotomous	• Yes: School has an official program in which more experience teachers coach or mentor less experienced teachers • No: school has no such program	Portner, 2005
Evaluation	Dichotomous	• Yes: School has an official program in which teachers are evaluated according to a defined rubric or criteria • No: school has no official program	Pianta, La Paro, & Hamre, 2005
Teacher Pay	Dichotomous	• Yes: School has a differential pay program in which teachers are paid based upon performance and/or specialization • No: school implements a uniform pay scale for all teachers	Odden, Kelley, Heneman, & Milanowski, 2001

Student Involvement

Most schools place all decision-making authority with adults in the school (i.e., the principal, teachers, or other administrative staff members). A student government or student council may exist, but generally does not have a voice in school-level management issues; rather, these student groups are usually limited to issues like yearbooks and school dances.

Other schools, in contrast, assemble a governmental body or congress of students, and this body participates in school-level decision-making as an equal partner. This could be a group of students elected by their peers or it could be comprised of the entire student body.

In terms of rule-setting and student discipline, most schools, especially district-run schools, handle this through an assistant principal or some sort of dedicated staff member. Other schools, in contrast, assemble a student court to deal with student infractions or adjudicate disputes among students. The variables are presented below in Table 9.

Table 9	Student Involvement–related Variables		
Name	Variable Type	Description	Relevant References
Creation of Rules	Categorical	· Total responsibility: Students create/modify school rules · Participatory: Students participate in the process of creating/modifying school rules · None: Students have no role in creating/modifying school rules	
Student Court	Dichotomous	· Yes: school makes use of a student court to deal with student infractions of the rules or adjudicate student disputes · No: student court is not used (an administrator, such as assistant principal, deals with disciplinary issues)	
Budget	Dichotomous	· Yes: students participate in the process of creating the school budget · No: students do not participate	
Staffing	Dichotomous	· Yes: students participate in the process of determining whether to retain school staff · No: students do not participate	

Parental Involvement

Some schools, especially newer schools, have experimented with a signed parental compact as a precondition for enrollment. This compact oftentimes states a number of hours that parents are expected to volunteer at the school during the course of the school year, or the nature of the role that the parent is expected to fulfill in relation to their child's education. Parents that fail to meet the terms of this compact are sometime "prevented" (or strongly discouraged) from enrolling their child in school the following year.

At the same time, some schools have official policies regarding how often a teacher is expected to contact each student's parents during the course of the school year. Most often, the topic for these parental contacts is the student's academic progress. The variables are presented below in Table 10.

Table 10 Parent Involvement–related Variables			
Name	Variable Type	Description	Relevant References
Parental Compact – Volunteer	Dichotomous	· Yes: school requires parents to volunteer as a condition of enrollment · No: no volunteer requirement	
Parental Compact – Homework	Dichotomous	· Yes: school requires parents to ensure students spend a certain number of hours on their homework each night as a condition of enrollment · No: no homework requirement	
Parental Compact – Discipline	Dichotomous	· Yes: school requires parents to actively enforce school behavior and discipline policies · No: no discipline requirement	
Parental Contact	Quantitative	For those schools that have an official policy for parental contact, this is the required number of contacts that teacher must make with parents each school year	

Measuring Success

By understanding how a school measures their own success, a researcher gains new insight into the goals of the school and the outcomes that are valued by the school's leaders. Most schools evaluate themselves in terms of standardized test scores and attendance, but many newer schools, especially chartered schools with rigorous sponsor contracts, are evaluated based upon factors such as attendance, graduate rates, disciplinary referrals, school safety, parent satisfaction, and fiscal soundness. The variables are presented below in Table 11.

Table 11	Measuring Success–related Variables		
Name	**Variable Type**	**Description**	**Relevant References**
Attendance	Dichotomous	• Yes: School uses attendance as a measure of success • No: School does not use attendance as a measure of success	
Graduate Rate	Dichotomous	• Yes: School uses graduation rate as a measure of success • No: School does not use graduation rate as a measure of success	
Disciplinary Referrals	Dichotomous	• Yes: School uses (lack of) disciplinary referrals as a measure of success • No: School does not use disciplinary referrals as a measure of success	
School Safety	Dichotomous	• Yes: School uses student safety as a measure of success • No: School does not use student safety as a measure of success	
Parent Satisfaction	Dichotomous	• Yes: School uses parent satisfaction as a measure of success • No: School does not use parent satisfaction as a measure of success	
Fiscal Soundness	Dichotomous	• Yes: School uses fiscal soundness as a measure of success • No: School does not use fiscal soundness as a measure of success	

Other Variables

Administration-related variables that are traditionally used in school evaluation include financial expenditures (i.e., dollars per student and/or percent of budget spent on instruction), the nature of the staff (i.e., years of experience, the percentage holding advanced degrees, and the percentage holding state and/or national board certification), the number and nature of any school-community partnerships, the presence or absence of admissions requirements and the presence or absence of a policy on school uniforms. The variables are presented below in Table 12.

Table 12	Other Administration-related Variables		
Name	Variable Type	Description	Relevant References
School Finances	Quantitative (2)	1. Expenditures: Total dollar amount per student 2. Efficiency: Percent of budget spent directly on instruction	Cici, Papierno, & Mueller-Johnson, 2002; Goertz & Stiefel, 1998; Greenwald, Hedges, & Laine, 1996; Hanushek, 1996
Staff Size	Quantitative	Number of students per teacher or average class size	Betts & Shkolnik, 1999; Pong & Pallas, 2001; Rivkin, Hanushek, & Kain, 2005; Wright, Horn, & Sanders, 1997
Teacher Qualifications	Quantitative (4)	1. Average years of experience 2. Percent of staff with advanced degree (i.e., M.Ed.) 3. Percent of teachers with state certification 4. Percent of teachers with National Board Certification	Ghaith & Yaghi, 1997; Morrison, 1991; Palmer, Stough, Burdenski, & Gonzales, 2005
School-Community Partnerships	Dichotomous (?)	1. Athletics: school does or does have a relationship with this sort of community organization 2. Trade/vocational: school does or does have a relationship with this sort of community organization 3. College/university: school does or does have a relationship with this sort of community organization 4. Other?	Bouillion & Gomez, 2001; Hands, 2005; Ouellette, Briscoe, & Tyson, 2004

Admissions Policy	Categorical	• Restricted: school has official requirements for admission (generally based upon academics) • Open with Screening: school has no official admissions requirements, but does conduct extensive screening interviews with applicants to determine their suitability to the school • Open: school has no admissions requirements or screening process for new applicants	
School Uniforms	Dichotomous	• Yes: school has a uniform policy (or a policy on clothing) that applies to all students • No: no policy exists	Alleyne, LaPoint, Lee, & Mitchell, 2003; Bodine, 2003

Facilities and Resources

These variables refer to the nature of the facility in which the school is located and the resources that are available to students. This is one of the more dramatic differences among district-run, private and chartered schools. District and private schools often have their own facility designed specifically for their learning model, whereas new chartered schools often have to make do with shared space, occasionally in office buildings or other non-standard settings. These issues can have a strong impact on the finances of the school and the safety and security of the school environment. In addition, if teachers and staff have to spend large amounts of time dealing with facility-related issues, then there is less time for group and individual planning, which can impact the quality of the learning environment.

School Building

Some schools (in fact, nearly all district-run schools) reside in their own facility, and generally this facility has been designed specifically for educational purposes. In contrast, some chartered schools, especially small schools, share space with other schools, albeit in actual school buildings. Beyond this, some chartered schools even share space with other types of organizations in other types of structures that were not originally intended to house schools. For example, River Heights Charter School in West St. Paul, MN, rents space in an office building, while Valley New School in Appleton, WI, is located in a downtown retail center.

Most district-run schools and some chartered schools own their own facility (or, more accurately, the facility is owned by the managing district), whereas other chartered schools lease space. Leasing arrangement could be undertaken with a school district for a standard school building, or, in the case of a shared-alternative location, could be undertaken with any sort of landlord. The variables are presented below in Table 13.

Table 13	School Building–related Variables			
Name	Variable Type	Description	Relevant References
Configuration	Dichotomous	· Traditional: school resides in a traditional facility with classrooms, hallways, etc. · Alternative: school resides in a non-traditional facility, without classrooms or hallways	
Occupancy	Dichotomous	· Private: a school resides by itself in a facility · Shared: a school shares a facility	
Ownership	Dichotomous	· Owned: a school owns the facility in which it resides · Leased: a school leases a facility	

School Status

When a school is created, it can be created as a wholly new entity or it can be created out of an existing school. When an existing district-run school is given a chartered status, it is referred to as a "converted" school. A converted school generally remains in the same school building with mostly the same administration and staff, but is some cases a single large district-run school can be converted to several smaller chartered schools that share the building.

A school that is closed and then re-opened with a wholly new administration and/or staff is referred to as a "reconstituted" school. Schools that are reconstituted generally remain under district control, although this is not always the case; occasionally, a school can be reconstituted and converted to chartered status at the same time. Reconstituted schools generally remain the same size and are usually located in the same building.

For schools that are new or have recently undergone a change in status, the first few years are critical; if routines emerge and a culture is established, the school can grow and mature, and student success should follow. Even the most successful new schools, though, can require several years to stabilize and mature. As a result, the first few years of a school's existence may not be representative of the school's proficiency or potential, and researchers should be wary of drawing substantive conclusions during this time. The variables are presented below in Table 14.

Table 14	School Status-related Variables		
Name	Variable Type	Description	Relevant References
School Genesis	Categorical	· New: school was created as a wholly new entity · Converted: existing district-run school was converted to chartered status · Reconstituted: existing district-run school was reconstituted with a new administration and/or staff · Reconstituted and Converted: existing district-run school was reconstituted with a new administration and/or staff and converted to charted status at the same time	
Years in Operation	Quantitative	Number of years the school has been in operation in its current instantiation	

Use of Technology

Schools vary greatly in the degree to which technology is integrated into the school day. In some schools, technology is nonexistent; in others, technology exists but is only rudimentary (i.e., Web, email, etc.). In some newer learning environments, however, technology is central to student learning. In such environments, students may do some or most of their work remotely and communicate with teachers and other students using videoconferencing or groupware technologies. Student work can be created, managed, shared and graded using workflow and project-management software, and students can utilize authoring tools to create multimedia presentations and project summaries. Students may also have access to audio and video technology for projects related to performing arts or journalism. Thus, it is critical to consider not only the type of technology in the school, but also the amount of time a student may spend interacting with technology during an average school day. The variables are presented below in Table 15.

Table 15 Technology-related Variables			
Name	Variable Type	Description	Relevant References
Student-Computer Ratio	Quantitative	Number of students for every computer	
Type of Technology	Dichotomous (5)	1. Web: Whether a student has regular contact with the World Wide Web (yes/no) 2. C.I.: Whether a student has access to computer-based instruction (yes/no) 3. Authoring: Whether a student has access to Web authoring tools (yes/no) 4. Groupware/workflow: Whether a student interacts with teachers and/or other students using groupware or workflow technology (yes/no) 5. Audio/video: Whether a student has access to audio and/or video technology (yes/no)	Chou & Liu, 2005; Ruthven, Hennessy, & Brindley, 2004; Shell, Husman, Turner, Cliffel, Nath, & Sweany, 2005
Time with Technology	Quantitative	Percent of student time spent working directly with technology or hours/days/weeks working directly with technology per day/week/year	Cuban, Kirkpatrick, & Peck, 2001

Support Services

Schools can be compared based upon the number and type of support services that are provided. These services can positively influence student performance and can include a dedicated school counselor or psychologist, social worker, community liaison, nurse, or a parental education, student tutoring, or hot lunch program. The variables are presented below in Table 16.

Table 16	Support Service-related Variables		
Name	Variable Type	Description	Relevant References
School Counselor	Quantitative	Ratio of counselors to students	
School Psychologist	Quantitative	Ratio of psychologists to students	
Social Worker	Quantitative	Ratio of social workers to students	
School Nurse	Quantitative	Ratio of nurses to students	
Community Liaison	Quantitative	Ratio of liaisons to students	
Parental Education	Dichotomous	· Yes: School provides this service · No: School does not provide this service	
Tutoring Program	Dichotomous	· Yes: School provides this service · No: School does not provide this service	
Hot Lunch	Dichotomous	· Yes: School provides this service · No: School does not provide this service	

Other Variables

Facility or resource-related variables that are traditionally used in school evaluation include school size (either in terms of number of students or number of teachers, or both), grade configuration, and location (i.e., rural, urban, suburban, etc.). The variables are presented below in Table 17.

Table 17 Other Facility-related Variables			
Name	**Variable Type**	**Description**	**Relevant References**
School Size	Quantitative	· Number of teachers and/or students	Anderman, 2002; Bryk & Thum, 1989; Lee, Bryk, & Smith, 1993; Lee & Smith, 1995; Rumberger & Thomas, 2000
Grade Configuration	Categorical	· Typical grade configurations could include K–5, K–6, 6–8, 7–9, 6–12, 7–12, 9–12, 10–12, or K–12.	Anderman & Kimweli, 1997; Anderman & Maehr, 1994
Location	Categorical	· Typical school locations could include urban, suburban, rural, or medium-sized town.	Sirin, 2005

Not Yet Included

There are some key characteristics of schools that are not yet explicitly included in our framework for various reasons. A characteristic may be difficult to measure according to what we understand that the current time, or we may be undecided about whether the characteristic is inside or outside of our scope.

Difficult to Measure

Some characteristics of schools may have very strong impact on student outcomes but may be difficult to measure using existing approaches:

- Quality of Leadership: The "quality" of leadership in a school can play a large role in a school's success (e.g., Blase, 1987), but how exactly can the "quality" of school leadership be defined and measured objectively?

- Quality of Oversight: The success or failure of a chartered school can depend in large part on the "quality" of the oversight provided by the charter sponsor or authorizer (e.g., NACSA, 2005), but again, how exactly can "quality" be defined and measured objectively?

- Rigorous Curriculum: Some research purports to demonstrate that a rigorous, intellectually demanding curriculum can lead to greater student achievement (e.g., Lee, Croninger, & Smith, 1997). However, can the "rigor" of a curriculum be measured by examining the schools' class of–ferings? Can it be determined by how many students enroll for more demanding courses? What is the mechanism in a school that sorts students into classes? Can this be captured and measured? Is the dropout rate a significant confound? In other words, does a demanding curriculum succeed because it forces the academically challenged students to drop out more quickly, thus raising the average test scores across the student body (e.g., Rumberger & Palardy, 2005)?

- Alignment: The alignment of the school curriculum with the state tests (and the state standards) is believed to impact student achievement (e.g., EdSource, 2006). How can "alignment" be measured? Or, is it more accurate to say that the key factor is the alignment of the state test with the state standards, making this a state issue and not a school issue?

- Coherence: The coherence of the school curriculum across grade levels is believed to impact student achievement (e.g., EdSource, 2006), but how can "coherence" be measured? In addition, if curricular decisions are made outside of a school, is this really a school issue?

Out of Scope

Some characteristics of schools may not belong within the framework given our stated scope:

- School Culture: School culture is considered by some researchers as a vital component of student success (e.g., DeWit et al., 2000; Van Houtte, 2005). However, there is no common approach to measuring this concept, and there could be a valid disagreement over whether this characteristic is part of the structure and operation of a school. For example, is a "school culture" something that is designed into a school's structure and operation, or is it the result of a school's structure and operation? Would it be more appropriate to consider school culture to be an outcome rather than a design feature?

- High Expectations: Research has shown that high expectations in a school can impact student outcomes (e.g., Gill, Ashton, & Algina, 2004; Lee & Smith, 1999; Middleton & Midgley, 2002; Phillips, 1997), but once again, is this characteristic of a school something that is designed into a school's structure and operation, or is it the result of a school's structure and operation? Does it result, for example, from the "quality of leadership"?

- Quality of Teaching: Student learning oftentimes depends on the quality of the teaching provided in the school (e.g., Rivkin, Hanushek, & Kain, 2005). However, is "quality of teaching" part of the structure and operations of a school? Or, is there something that a school does that encourages quality teaching, such as regular professional development, or teacher coaching or mentoring for young teachers? Our interest, in this case, would be to capture the aspects of school operations that encourage "quality teaching".

- Student Population: The makeup of the student population has been shown to affect the level of student achievement in a school (e.g., Rumberger & Willms, 1992). However, can we consider student variables to be part of the structure and operations of a school? As with "quality of teaching", is there something that a school is or does to attract a certain type of student population? If so, then our framework should capture these variables, and we should consider the makeup of the student population to be an outcome.

Conclusions

Implications

Given the current focus on school evaluation and accountability, it is vitally important to consider those differences among schools that can be expected to contribute to student behavioral, emotional, and academic outcomes. The current practice of comparing "district vs. charter" schools or "public vs. private" schools obscures the more important differences that such schools may have and does not provide a basis for substantive conclusions.

Scientists involved in research on school performance would be well-advised to probe more deeply into school pedagogy, administration, and facilities in order to isolate those factors that truly contribute to students' behavioral, emotional and academic outcomes. The framework presented here can serve as a starting point in this effort.

Foundations interested in contributing to a more profound understanding of schools and schooling should, first and foremost, decline to fund further research in this field that does not take into account the more important differences among schools. After a decade or more of research on chartered schools, we are no closer to understanding whether chartered schools as a group are successful, and if so, the key features of chartered schools that contribute to their success. Further investment in this type of research is not warranted; rather, a new approach is required that is willing to look deeper into schools and discover the myriad ways they differ. Research of this nature should be aggressively pursued.

Finally, policymakers should be wary of basing any decision-making on research that ignores the key features of schools in favor of an overly-simplistic formula for comparing schools that has not served us well. Before any new legislation is considered that is aimed at either promoting or discouraging the growth of chartered schools, a deeper understanding of these schools should be sought. In this effort, it is hoped that the framework presented here can serve as a first step.

Next Steps

In the current phase of the project, we are attempting to catalogue differences in schools that could be expected to impact student outcomes. In this process, we rely on existing research as well as direct observations in schools to identify components of this framework. To develop a taxonomy, however, we must describe large numbers of schools using this framework; following this, we will utilize clustering software to group the schools into classes (Bailey, 1994).

Thus, unlike a typology which is essentially theoretical in nature (e.g., Carpenter, 2006), our taxonomy

> It is vitally important to consider those differences among schools that can be expected to contribute to student behavioral, emotional, and academic outcomes. The current practice of comparing "district vs. charter" schools or "public vs. private" schools obscures the more important differences that such schools may have.

will be empirical. In other words, our taxonomy for schools will be driven by a quantitative analysis of the data we collect, resulting in a classification system that is both more detailed and more grounded in reality, and, ideally, more useful for researchers, policymakers, and grantmakers.

Finally, we hope that the research community will take up the challenge discussed in this paper and continue to refine the school taxonomy over time. In the effort to fully comprehend educational innovation and its impact on students, a properly defined taxonomy is critical.

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APPENDIX: List of Categories, Subcategories, and Variables

1. **Learning Model**
   a. Curriculum
      i. Amount of Structure (Categorical; see pg. 9)
      ii. Course Offerings (Dichotomous; see pg. 10)
      iii. Authentic Pedagogy (Dichotomous; see pg. 10)
      iv. Common Planning Time (Quantitative; see pg. 10)
      v. Curricular Themes (Dichotomous; see pg. 10)
      vi. Individual Learning Plan (Dichotomous; see pg. 10)
      vii. Pace (Dichotomous; see pg. 10)
   b. Assessment of Learning
      i. Grades (Categorical; see pg. 11)
      ii. Performance Assessments (Categorical; see pg. 11)
      iii. Student Reflection (Dichotomous; see pg. 11)
   c. Place and Time
      i. Place (Quantitative; see pg. 12)
      ii. Learning Time (Quantitative; see pg. 12)
      iii. Daily Schedule (Categorical; see pg. 12)
   d. Teacher-to-student Programs
      i. Advisory Grouping (Categorical; see pg. 13)
      ii. Looping (Dichotomous; see pg. 13)
   e. Student-to-student Programs
      i. Student Tutoring Program (Dichotomous; see pg. 14)
      ii. Student Mentoring Program (Dichotomous; see pg. 14)
      iii. Student Conflict Resolution Program (Dichotomous; see pg. 14)
   f. Other Variables
      i. AP/IB Offerings (Quantitative; see pg. 15)
      ii. Ability Grouping (Dichotomous; see pg. 15)
      iii. Cooperative Learning (Dichotomous; see pg. 15)
      iv. Arts Focus (Dichotomous; see pg. 15)
      v. Cultural Focus (Dichotomous; see pg. 15)
      vi. Multi-lingualism (Dichotomous; see pg. 15)

2. **Administration**
   a. School Management
      i. External Affiliation (Categorical; see pg. 17)
      ii. School Autonomy (Dichotomous; see pg. 17)
      iii. School Leadership (Categorical; see pg. 17)
   b. Teacher Development
      i. Professional Development (Quantitative/Dichotomous; see pg. 18)
      ii. Coaching/ Mentoring Program (Dichotomous; see pg. 18)
      iii. Evaluation (Dichotomous; see pg. 18)
      iv. Teacher Pay (Dichotomous; see pg. 18)
   c. Student Involvement
      i. Creation of Rules (Categorical; see pg. 19)
      ii. Student Court (Dichotomous; see pg. 19)
      iii. Budget (Dichotomous; see pg. 19)
      iv. Staffing (Dichotomous; see pg. 19)
   d. Parent Involvement
      i. Parental Compact – Volunteer (Dichotomous; see pg. 20)
      ii. Parental Compact – Homework (Dichotomous; see pg. 20)
      iii. Parental Compact – Discipline (Dichotomous; see pg. 20)
      iv. Parental Contact (Quantitative; see pg. 20)
   e. Measuring Success
      i. Attendance (Dichotomous; see pg. 21)
      ii. Graduate Rate
      iii. Disciplinary Referrals (Dichotomous; see pg. 21)
      iv. School Safety (Dichotomous; see pg. 21)
      v. Parent Satisfaction (Dichotomous; see pg. 21)
      vi. Fiscal Soundness (Dichotomous; see pg. 21)
   f. Other Variables
      i. School Finances (Quantitative; see pg. 22)
      ii. Staff Size (Quantitative; see pg. 22)
      iii. Teacher Qualifications (Quantitative; see pg. 22)
      iv. School-Community Partnerships (Dichotomous; see pg. 22)
      v. Admissions Policy (Categorical; see pg. 23)
      vi. School Uniforms (Dichotomous; see pg. 23)

3. **Facilities and Resources**
   a. School Building
      i. Configuration (Dichotomous; see pg. 25)
      ii. Occupancy (Dichotomous; see pg. 25)
      iii. Ownership (Dichotomous; see pg. 25)
   b. School Status
      i. School Genesis (Categorical; see pg. 26)
      ii. Years in Operation (Quantitative; see pg. 26)
   c. Use of Technology
      i. Student-Computer Ratio (Quantitative; see pg. 27)
      ii. Type of Technology (Dichotomous; see pg. 27)
      iii. Time with Technology (Quantitative; see pg. 27)
   d. Support Services
      i. School Counselor (Quantitative; see pg. 28)
      ii. School Psychologist (Quantitative; see pg. 28)
      iii. Social Worker (Quantitative; see pg. 28)
      iv. School Nurse (Quantitative; see pg. 28)
      v. Community Liaison (Quantitative; see pg. 28)
      vi. Parental Education (Dichotomous; see pg. 28)
      vii. Tutoring Program (Dichotomous; see pg. 28)
      viii. Hot Lunch (Dichotomous; see pg. 28)
   e. Other Variables
      i. School Size (Quantitative; see pg. 29)
      ii. Grade Configuration (Categorical; see pg. 29)
      iii. Location (Categorical; see pg. 29)

4. **Not Yet Included**
   a. Difficult to Measure
   b. Out of Scope