Practices Worthy of Attention

Step Up to High School

Chicago Public Schools

Chicago, Illinois

Summary of the Practice. Step Up to High School is a four-week transitional summer program for incoming ninth-graders in Chicago Public Schools. The program focuses on mathematics and literacy and incorporates a counseling component that aims to build students' academic, study, and interpersonal skills. Students learn mathematics and English language arts through hands-on activities, collaborative groups, and real-life applications.

Need. Chicago data indicated a high failure rate in Algebra I and under-representation of Hispanic and black students in upper-level math courses. The district believed that students who passed Algebra I and English in their freshmen year were much more likely to graduate high school.

Goal. The goal of Step Up to High School is to encourage more students on the cusp of academic success to become engaged in academics and have a smooth transition from middle to high school, which will ultimately lead to higher graduation rates and successful high school experiences.

Demographics

Chicago Public Schools serves grades K–12. Enrollment dropped by about 16,000 students from 2001–2002 to 2004–2005 (see Table 1).

Table 1. Chicago Public Schools Enrollment Data

Academic Year	Enrollment
2001–2002	426,273
2002–2003	426,040
2003–2004	420,322
2004–2005	410,874

Table 2 shows the percentage of students enrolled and graduating since 2001–2002 by race/ethnicity, limited proficiency in English, and economic disadvantage. As of 2004–2005, the majority of students in Chicago were black (49.2% of students), followed by Hispanic students (38.4%), white students (8.8%), and Asian American students (3.3%). About 14% of Chicago students were classified as limited English proficient and about 85% as economically disadvantaged. High school graduation rates have increased over the years for all students and most subgroups except for students who have limited English proficiency or are economically disadvantaged.

Table 2. Chicago Public Schools Enrollment and Graduation Rates

Demographics	Academic Year	Percentage Enrolled	Percentage Graduating
All Students	2001–2002	100	68.5
	2002–2003	100	69.8
	2003–2004	100	70.7
	2004–2005	100	74.0
Asian American	2001–2002	3.3	88.0
	2002–2003	3.3	84.9
	2003–2004	3.3	84.4
	2004–2005	3.3	85.7
Black	2001–2002	50.8	66.7
	2002–2003	50.4	68.1
	2003–2004	49.7	68.6
	2004–2005	49.2	73.9
Hispanic	2001–2002	36.1	66.7
	2002–2003	36.8	68.5
	2003–2004	37.6	70.2
	2004–2005	38.4	70.7
White	2001–2002	9.6	73.6
	2002–2003	9.3	74.0
	2003–2004	9.1	74.6
	2004–2005	8.8	79.0
Limited English Proficient	2001–2002	14.3	70.0
	2002–2003	14.5	55.3
	2003–2004	14.1	45.4
	2004–2005	14.0	43.5
Economically Disadvantaged	2001–2002	85.3	89.2
	2002–2003	84.9	65.9
	2003–2004	85.2	66.7
	2004–2005	85.4	73.3

Description of the Practice

Step Up to High School is an inquiry-based literacy and mathematics program for students in the summer before their ninth-grade year. Step Up is not a remedial program; its purpose is to help students in the transition from middle to high school and to build the academic skills in reading and mathematics that are key to high school success. The academic program also

consists of orientation seminars and activities, information about high school activities, resources, and study skills (e.g., organizational skills, time management). In the summer prior to ninth grade, students attend Step Up at the high school they will attend and are taught by teachers who teach at that school in the regular academic year, ideally by the teacher who will be their freshman Algebra teacher. This means that students meet teachers and classmates before high school begins and learn to navigate through their new physical surroundings.

Step Up to High School models its format on the Emerging Scholars Program used at the college level for improving minority and female participation in mathematics. Research on successful programs transitioning students from middle school to high school or high school to college indicate several important aspects to be attended to (Clubine, 1993):

- Placing special emphasis on students' freshman year while providing differentiated support for students.
- Helping develop a supportive academic network, by recognizing the negative effects of social isolation on academic success.
- Increasing teacher capacity in understanding ethnic- and gender-based differences and providing better interactions between teachers and students.
- Providing and promoting interactive, hands-on, real-life applications of the content.

Much of the research supporting the efficacy of programs like the Emerging Scholars Program has focused on the transition from high school to college, but these programs all take note of the previous learning experiences of students. The transition from middle school to high school is an early indicator of whether students even apply for college, so a bridge program to high school, with a focus on students who are often overlooked, can increase the population of students who find high school success and go on to college.

Step Up began in summer 2003, and in that summer the program had 1,661 students; in 2004, there were 2,929 students enrolled, and in 2005, there were 1,743. Students are eligible to attend if they are graduating eighth grade from Chicago Public Schools, are not required to attend another summer program, and scored between the 35th and 49th percentile in reading or mathematics on the Iowa Test of Basic Skills in the seventh grade or on ACT's EXPLORE test in the eighth grade. Step Up targets these students because they are likely to be overlooked by other programs; their low test scores indicate that they are "at-risk" for academic failure as they transition into high school, but the scores are not quite low enough for the students to be placed automatically in other academic support programs.

Students are in the program five days a week, four hours a day, for four weeks. Step Up consists of three components, which together have the goal of facilitating the building of relationships around academic interest and teacher-student relationships and student-student relationships. The first two components are literacy and mathematics, and students spend 90 minutes in each content area each day. The math content focus is on learning conceptually and modeling practices that mathematicians use (thinking, reasoning, collaborating, presenting findings to peers, engaging in discourse/debate) and learning what will be expected

of them in high school mathematics courses. The third component is a 45-minute guidance session. This session helps students build a support network with their peers and school counselor while also familiarizing them with academic expectations for high school success.

The core of the mathematics curriculum for Step Up initially was an algebra unit from Connected Mathematics, but it was eventually replaced with the district-adopted Mathematics in Context program. During the summer mathematics classes, Step Up teachers have students work in groups of three or four to discuss ideas and solve problems together. Teachers encourage students to make presentations of their work, so students not only collaborate but also have accountability to the class. Teachers also have students make concrete models of different mathematics problems. For instance, before talking about slope and the concept of rise over run, students make staircases out of paper based on how many steps are needed for a certain distance from a height on a wall. As students cut the paper and fold it to make the staircases, their hypotheses can be confirmed or refuted. Having the hands-on model of the staircase allows students to visualize the concept concretely, rather than looking at two-dimensional graphs that might not solidify the idea.

Step Up tries to make the program meaningful to students by making the components have real-world applications. For instance, the guidance session provides concrete materials and terminology that students will need to know in high school (e.g., GPA, transcripts).

Teachers' professional development for Step Up includes five sessions held before the summer program, and five sessions held weekly as two-hour Wednesday meetings during the summer program for support and reflection. The goal of these ongoing meetings is to develop a strong professional community of teachers focusing on freshman instruction. In the professional development sessions, Step Up facilitators give teachers handouts discussing the research behind the program in addition to supplemental materials relevant to each session, such as information on best practices in teaching pedagogy (specifically inquiry-based techniques, since that is the focus of Step Up).

Professional development meetings during the four weeks of Step Up are run like graduate school seminars; teachers read assigned materials and then in the meetings discuss theory and practice, referring to examples from their current classrooms to help support or refute an idea from the readings. These seminar-style discussions allow teachers to translate theoretical ideas into concrete practice and discover common ways they can improve their practice. The professional development facilitators model this interactive, learner-centered, collaborative environment that teachers can then use in their own classrooms. Teachers can also bring in videotapes of their classes for feedback and help from the other Step Up teachers, as they are encouraged to try out new curricula and teaching methods in an environment that is without the pressures of content coverage and high-stakes tests from the regular school year.

Results

It is difficult to measure the success of Step Up, given only data from tests for all Chicago Public Schools students, but Table 3 shows trends in large-scale test scores at the secondary level. Table 3 lists the results for the past few years for Chicago Public Schools on the Illinois Standards Achievement Test (ISAT) for grade 8 and the Prairie State Achievement

Examination (PSAE) for grade 11 in mathematics by race/ethnicity, limited English proficiency, and economic disadvantage. The 2005–2006 data were was not available when this report was written.

Table 3. Chicago Public Schools Mathematics Exam Results by Race/Ethnicity

Demographics	Academic Year	Percentage Met/Exceeded Standard	
		Grade 8 (ISAT)	Grade 11 (PSAE)
All Students	2001–2002	30.6	26.5
	2002–2003	30.7	27.4
	2003–2004	33.3	27.8
	2004–2005	32.3	27.5
Asian American	2001–2002	72.7	61.5
	2002–2003	70.7	65.2
	2003–2004	77.0	68.7
	2004–2005	78.0	68.6
Black	2001–2002	20.8	16.3
	2002–2003	21.0	17.7
	2003–2004	22.6	17.9
	2004–2005	20.8	15.9
Hispanic	2001–2002	32.4	25.8
	2002–2003	34.7	26.0
	2003–2004	37.5	27.0
	2004–2005	37.5	28.1
White	2001–2002	58.3	54.9
	2002–2003	57.3	55.3
	2003–2004	61.1	56.4
	2004–2005	63.8	59.5
Limited English Proficient	2001–2002	14.9	31.6
	2002–2003	8.0	14.8
	2003–2004	23.5	18.7
	2004–2005	25.3	19.8
Economically Disadvantaged	2001–2002	27.5	20.9
	2002–2003	27.5	21.9
	2003–2004	29.8	21.8
	2004–2005	28.5	21.9

From 2001–2002 to 2004–2005, the performance of all students improved on the grade 8 exam and remained relatively consistent on the grade 11 exam. All subgroups showed improvement on the grade 8 exam except black students, whose scores remained around 20% passing. Similarly, on the grade 11 exam, all subgroups' scores improved except those of

black students, which were at their lowest in 2004–2005. Economically disadvantaged students were performing better than students with limited English proficiency on both tests, but their scores had barely improved as a group, and thus the achievement gap did not show evidence of decreasing.

Evaluations of Step Up show promise for improvement of teachers' pedagogy and students' mathematical learning (Department of Program Evaluation, 2007; Office of Research, Evaluation, and Accountability, 2004). For instance, most teachers were respectful of students' ideas and answers, even if the students gave incorrect responses. Teachers also appeared comfortable with differentiated instruction, taking into account their students' differing levels of ability. The questioning techniques used were mainly open-ended, which encouraged student discussion. Lastly, teachers offered multiple strategies for solving particular problems. Collectively, observations showed teachers collaborating more with one another in addition to having student-centered classrooms.

Feedback from the teachers was positive and encouraging, as most teachers enjoyed the mathematics curriculum used in Step Up. Teachers' feedback was evaluated in debriefings after observations. They felt that their students were learning and had evidence they used to measure these gains, such as students helping one another, their willingness to collaborate, and the products of their group presentations. Although Chicago Public Schools does its best to link students with their future high school teachers, schedules and assignments would conflict, and teachers expressed concern that they might not be working directly with their Step Up students in their freshman year.

Observations of Step Up classrooms showed positive student behavior. In general, most students stayed on task and asked math-related questions. They appeared to enjoy collaborative learning, and, in general, were on task during collaborative learning time. Students' attitudes were measured with two online surveys, one upon entrance to the Step Up program and the other at the end of the four weeks. Overall, students had very positive responses to Step Up (Edejer, 2005; Office of Research and Evaluation, 2004). The majority of students thought that Step Up helped them learn strong mathematics skills, and they felt more comfortable with high school mathematics. In fact, 64% of students agreed they came to Step Up to get help with mathematics skills, and 82% felt that the program did indeed help them gain stronger mathematics skills. Almost all students (96%) felt they knew what to do to be successful in high school.

In Chicago, students are required to enroll in Algebra I their freshman year unless they have successfully completed Algebra I previously. Students with low scores on the math section of the Iowa Test of Basic Skills (ITBS) are required to enroll in a double-block period of Algebra I. As seen in Tables 4 and 5, students who participated in the Step Up program had significantly lower failure rates in their Algebra I and double-block Algebra I courses than those students who did not attend Step Up (Edejer, 2005; Office of Research and Evaluation, 2004).

Table 4. Percentage of Students Failing Algebra I

Semester	Step Up	Non-Step Up
Fall 2004	18.2	19.9
Spring 2004	25.6	27.4
Fall 2005	15.1	29.4
Spring 2005	24.3	36.0

In general, there are higher failures rates for both groups and courses in the spring semesters. The most striking difference in performance is in the Fall 2005 semester of Algebra I, where only about half as many Step Up students than non-Step Up students (eligible for Step Up, but who did not attend the program) failed (including those with higher ITBS scores).

Table 5. Percentage of Students Failing Double Period Algebra I

Semester	Step Up	Non-Step Up
Fall 2004	18.3	24.6
Spring 2004	24.3	30.6
Fall 2005	15.3	18.7
Spring 2005	21.7	26.3

Step Up students were also less likely to drop out after freshman year. In 2004, only 4.0% of Step Up students dropped out, as opposed to 6.9% of students of the same demographic (scoring between the 35th and 49th percentile in reading or mathematics on the ITBS in the seventh grade or on ACT's EXPLORE test in the eighth grade). In 2005, the dropout rate for Step Up students was down to 2.4%, while for non-Step Up students in the same demographic, the dropout rate was 6.7%.

Conclusions

Step Up shows promise for improving students' high school performance, as seen in passing rates in Algebra courses, dropout rates, surveys of student confidence, and surveys and observations of teacher capacity. Chicago Public Schools has been working on building a coherent database system to track students in Step Up, but have not yet begun to link their multiple databases to analyze test score data. As with any large urban school district, Chicago faces heavy staff turnover along with priorities that override the evaluation of the effectiveness of one of their programs. It is important that large programs like Step Up that can include nearly 3,000 students each summer are perpetuated when there are actual measures of effect to show what is working and what can be improved.

References

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About *Practices Worthy of Attention: Local Innovations in Strengthening Secondary Mathematics*

Practices Worthy of Attention is a joint initiative of Achieve, Inc. (www.achieve.org), and the Charles A. Dana Center at The University of Texas at Austin (www.utdanacenter.org). The initiative is led by Pamela L. Paek, a research associate at the Dana Center, who, in 2006, examined 22 program, school, and district practices that showed promise—based on early evidence and observation—of strengthening secondary mathematics teaching and learning.

Our goal was to document practitioners' descriptions of *what is really happening* in the field to strengthen secondary mathematics education around the country. Thus, while the practice highlighted may be common, the specific structures and strategies used to implement the practice are worthy of attention. These initial investigations set out to mark these practices for future rigorous scientific inquiry by Dana Center and other researchers.

Ultimately, we hope to create a community of inquiry made up of university researchers working with administrators and teachers from featured schools and districts to more rigorously research how effectively these practices improve secondary mathematics learning for all students.

Reports and practice profiles. An executive summary details the methods for this initiative and analyzes themes. Two cross-case analyses discuss specific strategies for raising student achievement and building teacher capacity. Brief profiles describe each practice. All of these publications are available on our website at www.utdanacenter.org.

Data. In all cases, data about the practice were provided by the program, school, or district studied as part of a description of their practice. We did not independently analyze data gathered through a consistent assessment tool, and we did not evaluate their uses of data for measuring effectiveness. Thus, the data in the practice profiles are intended not to prove the practice's effectiveness from a research perspective, but to paint a detailed picture of the practice and what data were used by the program, school, or district to gauge how well it was working.

Theoretical frameworks. In some cases, district staff mentioned specific literature on theory or practice that they used when they developed the practice we highlight. In those cases, we cite that literature in our discussion of the practice.

How to cite this profile

Paek, P. L. (2008, January). Step Up to High School: Chicago Public Schools. Case study from *Practices worthy of attention: Local innovations in strengthening secondary mathematics*. Austin, TX: Charles A. Dana Center at The University of Texas at Austin.