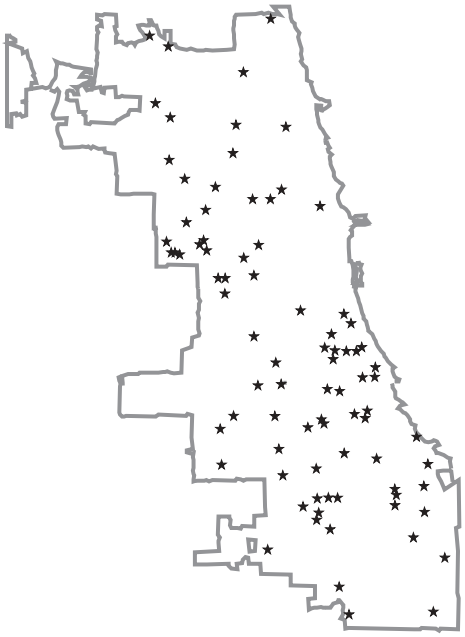

Research Data Brief

Teacher and Principal Responses to the Grow Network:

A Preliminary Evaluation of Use in Chicago Public Elementary Schools

January 2004

John Q. Easton
Stuart Luppescu

Consortium on Chicago School Research

Acknowledgments

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About Consortium Surveys

The Consortium on Chicago School Research has been surveying Chicago Public Schools teachers, students, and principals on a regular basis since the early 1990's. Beginning in 1997, these surveys have been conducted every two years in the late winter or spring. About half of the survey items measure the Essential Supports for Student Learning, a set of organizational characteristics that are evident in improving schools. These include school leadership, parent and community partnerships, student-centered learning climate, professional community and workplace, and quality instruction. Results from the survey are reported back to schools to assist them in planning and evaluating their programs. A second half of the survey contains special topic questions. Recently, these have included questions about relationships with external partners, the use of educational technology in schools, teachers' instructional practices in literacy, and on the 2003 survey, perceptions about the Grow Network.

Responses to the 2003 Surveys

This year, a total of 9,538 elementary school teachers in 384 schools completed the Consortium survey. The analysis reported in this study is restricted to 2,700 teachers in grades four through eight in 345 schools. The Grow questions appeared in a section of the survey taken by a random half of the respondents. In addition, 282 principals completed surveys that also asked a bank of questions about Grow.

Our preliminary analyses indicate that participating schools are fully representative of the school system in terms of racial composition, achievement level, and percentage low income. Details about these analyses will be included in a forthcoming survey technical manual.

Teacher and Principal Responses to the Grow Network:

A Preliminary Evaluation of Use in Chicago Public Elementary Schools

During the 2001-02 school year, Chicago Public Schools officials contracted with the Grow Network™ to provide supplemental reporting of student test results to parents, teachers, and school administrators.[1] Under terms of its contract with CPS, the Grow Network provides a variety of resources, including individualized, printed score reports for parents; classroom-level reports for teachers; and school building reports for principals. The Grow Network seeks to "transform assessment results into instructional tools for teachers, principals, and parents"[2] by reporting students' specific strengths and weaknesses as measured by standardized tests (primarily the Iowa Tests of Basic Skills) and offering a variety of suggestions and strategies to parents and teachers for addressing weaknesses and building on strengths. The Grow Reports replaced the classroom-level "skills analysis" printout that CPS produced for many years.

In addition to the print component of the Grow Reports, there are several web-based resources. These include an electronic version of the student scores found on the teacher reports. Because it is an interactive format, teachers can group students by particular skill sets and then regroup students according to other criteria. There are also instructional resources for teachers, including materials for teaching to specific skills, as well as additional assessments to judge student progress on those skills. School administrators have access to these classroom data for monitoring purposes. Parents may also enter the Grow Network website where they can find suggested reading lists and other tools for assisting their children.

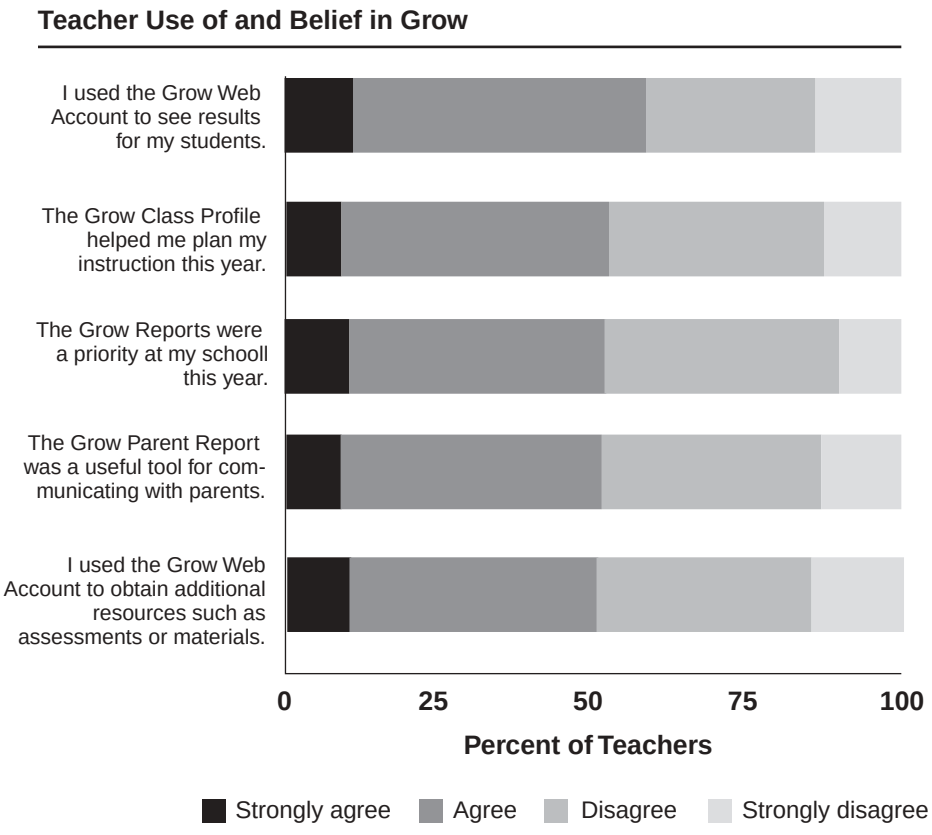
CPS engaged the Grow Network as part of its efforts to improve data access and develop greater capacity for "data-driven decision making" in schools. In theory, when educators have detailed information about students' achievement patterns, they can use this information to plan specific, individualized instructional interventions.[3] Administrators and teachers need data that suggest where interventions are required, for example, in what subject areas or grade levels and for which students or classrooms—and in the best cases, data that suggest what those interventions should be. The additional assessments can help educators determine whether their intervention strategies have been successful, thus providing a feedback loop for continuous progress.

Teacher Reports

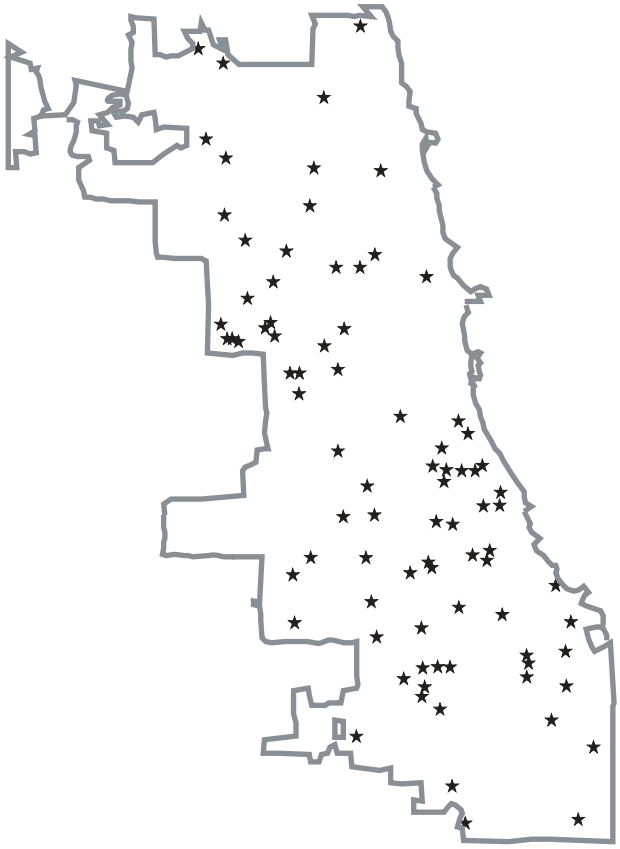
Because of the widespread interest in the Grow Network in Chicago (sparked both by its innovative nature and its cost—$2,000,000 annually), and because of our own interest in data use as a school improvement tool, the Consortium added five new questions about Grow use in Chicago Public Schools to its 2003 teacher and principal surveys.

CPS teachers' responses to these five questions are shown below. Overall, teachers felt moderately positive about their experiences with the Grow Network during its first year of implementation. About 60 percent indicated that they had used the Grow Web account to see results for their students. Fifty-four percent found that the Grow Class Profile helped them to plan instruction; 52 percent reported that the Grow Report was a priority at their school; 52 percent believed that the Grow Parent Report was useful for communicating with parents; and 50 percent indicated that they used their Grow Account for obtaining additional resources, such as assessments or materials. These data suggest that a majority of teachers in grades four through eight used the Grow resources, and that slightly more than half of respondents found the various components of Grow to be beneficial.[4]

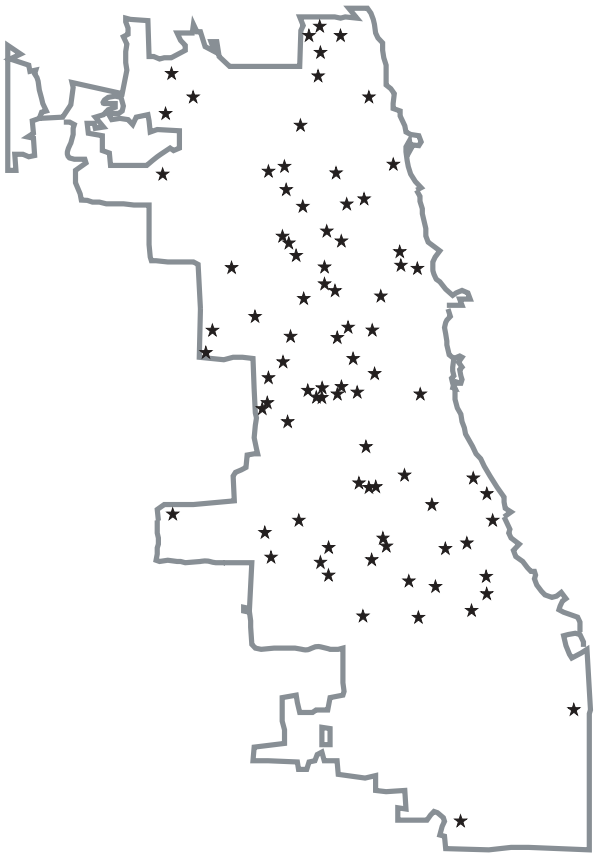
These citywide responses help provide a general view of how teachers embraced Grow in year one, but a more fine-tuned analysis is called for to help understand how Grow varies across the city and what factors influence its use. In order to facilitate this analysis, we used the Rasch method to create a single measure from the five Grow survey items. These items cohere nicely to create a highly reliable measure that we call *Teacher Use of and Belief in Grow*. Our analytic goal is to determine what factors are related to variability in *Teacher Use of and Belief in Grow* across Chicago's elementary schools.



Elementary Schools in Top Quartile of Grow Measure (2003 Survey)



Elementary Schools in Bottom Quartile of Grow Measure (2003 Survey)



Variability in Grow Use

For each school, we calculated the average score among teachers on *Teacher Use of and Belief in Grow*. On the city map, we have displayed the schools that scored in the top quarter and in the bottom quarter on this measure. For the most part, there are high and low responses all across the city, but there is also a distinct pattern.There are many more high Grow users on the Far South Side of the city, the mid-South Side near the lakefront, and the Far West Side. These are predominantly African-American areas. There is lower Grow use on the North Side in white, racially integrated, and Latino areas. Our statistical analyses confirm this eyeball inspection and show consistently greater Grow use in predominantly African-American schools.

We are interested in the factors that cause the variability noted on the maps—what are the individual characteristics of teachers themselves and the characteristics of their schools that are related to differential Grow use? We used hierarchical linear modeling (HLM) techniques to conduct these analyses. By placing teachers within their schools, HLM can estimate how much teacher differences and school differences contribute to the variation in *Teacher Use and Belief in Grow*.

In the first set of analyses, we looked only at demographic characteristics of the responding teachers and their schools. At the school level, Grow use is higher in predominantly African-American schools, as suggested by the maps. Also Grow use is slightly greater in higher-achieving schools (especially those with few white students). At the individual teacher level we find that white teachers are less likely to report Grow use than both African-American and Latino teachers; more experienced teachers use Grow more than less experienced teachers; and finally, teachers who have fewer students with significant reading

problems use Grow more often.[5] See page 7 for the full statistical model and results.

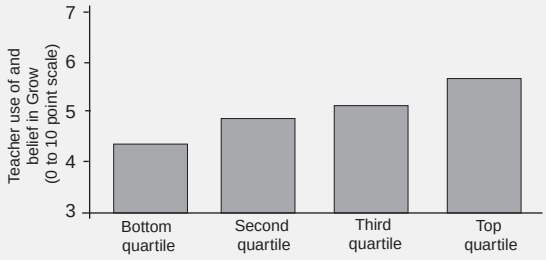
We went on to explore further teachers' experiences and school conditions that seemed to influence the adoption of Grow. Understanding these mechanisms might suggest strategies to CPS for encouraging more widespread or more intensive use of Grow.

Our analyses were guided by a framework created in a previous Consortium report on the availability and use of educational technology in CPS.[6] In that study, we developed and tested a theory of essential supports for the use of educational technology. We found that teacher assignment and subsequent student use of technology in school was highly influenced by a number of factors above and beyond the simple availability of hardware and software in schools. Several factors stood out as being important. Chief among these were the professional development opportunities in technology for teachers and the professional community within the school supporting technology use. In other words, teachers who had the opportunity to learn how to use technology, had supportive peers to work with, discussed and shared what they've learned, and tried out new approaches together, ended up being greater users of technology and assigned more technology applications to their students.

There were two other important factors that we also found to drive technology use among teachers and their students. First, technology was used more in schools where there were staff members or outside consultants (for example, a technology coordinator or specialist) to support the technology infrastructure. Even more important was prin-

Professional Development in Technology

Teacher Grow Use Varies by their Professional Development Experiences with Technology



The following items compose this measure.

Please indicate to what extent you agree with the following statements (strongly disagree to strongly agree).

I am aware of professional development that could enhance my ability to use computing technology in classroom instruction.

I have taken professional development that enhances my ability to use computing technology in classroom instruction.

The professional development available to me is relevant to how I believe computers should be used in the classroom.

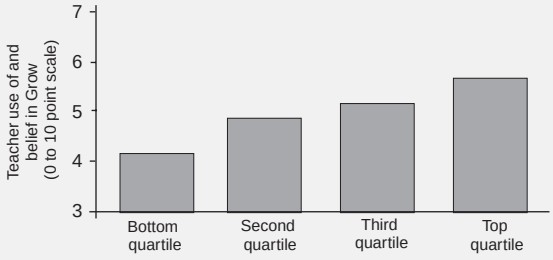
Please indicate to what extent, if any, each of the following are barriers to your use of school computers or the Internet for instruction.

Lack of release time to learn/practice/plan ways to use computers or the Internet.

Lack of appropriate professional development on how to integrate computing technology into curriculum.

Teachers' Own Use of Technology

Teacher Grow Use Varies by their use of Technology in Other Educational Realms



The following items compose this measure.

For each activity below, please indicate how often you use computers or the Internet to complete the activity (never to daily or almost daily).

Create instructional materials (I.e., handouts, tests, etc.)

Gather information for planning lessons.

Access model lesson plans.

Access research and best practices for teaching.

Create multimedia presentations for the classroom.

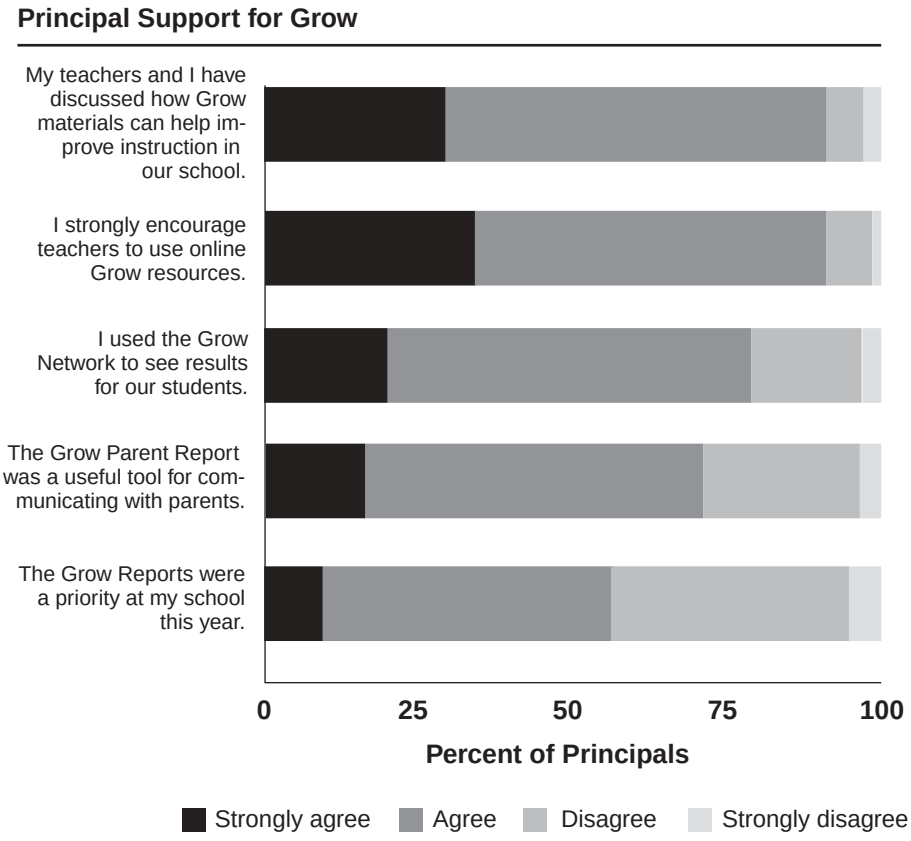
cipal leadership for technology use. In schools where principals made technology a priority, where they sought out and provided new resources, and where they encouraged new practices involving technology, teachers and their students used technology more frequently. This was certainly not a surprising finding given how important principal leadership is to innovation and school improvement in general.

Our 2003 surveys asked several of the same questions that were used in the technology study described above. We are also able to relate these questions to *Teacher Use of and Belief in Grow*. Our findings about Grow use tend to be very similar to what we found earlier about more general use of technology among teachers.

We find that teachers' Grow use is strongly influenced by three important factors: *Professional Development in Technology*, *Teachers' Own Use of Technology*, and *Principal Support for Grow*. When teachers receive professional development in technology, they are more likely to use technology in their classrooms. Because teachers who are more familiar with technology are more likely to use and understand Grow, professional development in technology influences teachers' Grow use.[7] It is not at all surprising that teachers who use computers or the Internet for other, similar purposes would also use Grow more extensively. These teachers have gained some comfort level and experience and presumably have found some benefit to their technology use. This would predispose them favorably to using Grow. The bar graphs on the previous page show how teachers' professional development experiences support that technology use and their other uses of technology influence their Grow use. Clearly, there are large differences in *Teacher Use and Belief in Grow* based on these two factors. A third influential factor, discussed below, is Principal Support for Grow.

Principal Support for Grow

Compared to teachers, CPS elementary principals are overwhelmingly positive about Grow. Nearly all principals reported having discussed with their teachers how Grow materials can help instruction in their schools; a similar preponderance had strongly encouraged teachers to use online Grow



resources. Eighty percent reported having used the Grow Network to see results for their students, and 72 percent believed that the Grow Parent Report was a useful tool for communicating with parents. About 58 percent indicated that the Grow Reports were a priority at their school last year. (A somewhat lower number—about 52 percent—of teachers agreed with this question.) Overall, then, principals' responses to the Grow Network are quite high. More interesting from our perspective is the strong connection between principal use of and belief in Grow and teacher use. The strongest reported teacher use occurs in schools where principal support is strongest.

The relationship between Principal leadership for *Teacher Use of and Belief in Grow* is statistically significant above and beyond the other factors discussed thus far. In other words, principals influence the use of the Grow Network even among teachers who have had less professional development in technology and have limited use of technology for other instructional and educational purposes. This also holds true regarding the demographic characteristics discussed earlier. This evidence suggests that principal support for Grow may be part of a leadership style that encourages innovation among teachers.

Summary

In summary, teachers are modestly positive about their use of and belief in Grow. Slightly more than half of CPS elementary teachers responded positively to a series of questions about Grow use. There are some notable patterns in Grow use across CPS. White teachers are less positive about Grow than African-American and Latino teachers. Grow use is greater in schools with predominantly African-American student enrollments. More experienced teachers, and those with fewer students with serious reading problems, use Grow more. These demographic patterns are interesting, but may result from other causes, such as teacher beliefs and attitudes towards standardized testing, that we have not measured. At this time, demographic differences provide little guidance in how to increase Grow use in order to optimize its effectiveness.

This study identified some useful information about other factors that schools and CPS as a whole can affect. Teachers who use technology for more general educational purposes and who have professional development opportunities use Grow more. Principals voice very strong support for Grow and they have a great deal of influence on their teachers' use of Grow. These findings suggest that principals make a big difference in schoolwide Grow use. By providing professional development opportunities and encouraging teachers to use technology in other realms, principals can set the stage for wider Grow use.

Does the Grow Network Lead to Higher Student Achievement?

This question will be on many people's minds in the coming years if CPS continues to make relatively large financial investments in this technology. Answering the question will require sophisticated research technologies, including careful, on-site case studies of how Grow is used and how it influences parent and teacher behaviors. The first year of implementation is too early to address the question, but it will be asked frequently in the coming years.

Results of HLM Analysis of Teachers Use of Grow

Table of Teacher-Level Effects

Predictor	Coefficient	Standard Error	T statistic	df	P-value
Professional development in technology	0.36	0.05	6.69	1404	<0.000
Teacher use of technology	0.44	0.06	7.40	1404	<0.000
White teacher[1]	-0.91	0.31	-2.91	1404	0.004
Latino teacher[1]	-0.18	0.45	-0.40	1404	0.690
Asian or native American teacher[1]	-0.17	0.47	-0.35	1404	0.723
Masters degree[2]	0.00	0.28	0.01	1404	0.992
Masters degree +15 or more hours[2]	-0.38	0.28	-1.37	1404	0.172
Doctoral degree[2]	1.68	1.12	1.50	1404	0.135
Years as a teacher	0.06	0.02	3.24	1404	0.002
Years as a teacher unknown	-0.19	0.74	-0.26	1404	0.799
Percent of students in bilingual program	-0.01	0.01	-1.53	1404	0.125
Percent of students with reading difficulties	-0.01	0.00	-2.05	1404	0.040

Table of School-Level Effects

Predictor	Coefficient	Standard error	T statistic	df	P-value
Intercept	0.22	0.14	1.59	216	0.113
Principal use of Grow	0.19	0.05	3.99	216	<0.000
Percent mobile students	0.03	0.01	1.73	216	0.085
Average achievement	0.05	0.02	2.07	216	0.039
Concentration of poverty	0.09	0.20	0.44	216	0.662
Crime in neighborhood of school	-0.38	0.20	-1.92	216	0.055
Predominantly Latino school[3]	-0.61	0.46	-1.34	216	0.182
Racially mixed school[3]	-0.19	0.62	-0.30	216	0.761
Predominantly minority school[3]	0.16	0.52	0.31	216	0.760
Integrated school	-1.45	0.63	-2.31	216	0.022

These tables contain the final three-level HLM results. Level one contains a measurement model weighting the outcome variable (Teacher Use and Belief in Grow) by its standard error. Level two includes teacher characteristics and Level three includes school characteristics.

We ran other variations of this model without the Principal Use of Grow measure in order to take advantage of the larger sample of schools and teachers where we did not have principal survey data. The results are consistent across models and samples.

The final model includes all of the teacher and school-level demographic control variables, plus the significant explanatory predictor variables.

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[1] African-American teachers is the omitted category.

[2] Bachelor's degree is the omitted category.

[3] Predominantly African-American school is the omitted category.

Endnotes

[1] See Board Report 02-0626-PR26, available at http://www.cps.k12.il.us/AboutCPS/Board/Board_Actions/FY01-02/June_2002_Board_Action/02-0626-PR26.pdf

[2] See http://www.grownetwork.com/ for more information.

[3] See http://www.ncrel.org/toolbelt/

[4] In the long run we would like to analyze actual teacher-use data, rather than only self-report data. We were able to obtain, from CPS, the percentage of teachers who had logged onto the Grow accounts by instructional areas. Though positively correlated with the survey responses, "the percentage logging onto Grow" seems too imprecise to be of much value here.

[5] Both teacher experience and the number of students with significant reading problems were measured by survey responses.

[6] Holly M. Hart, Elaine Allensworth, Douglas Lauen, and Robert M. Gladden, *Educational Technology: Its Availability and Use in Chicago's Public Schools*, September 2002, Consortium on Chicago School Research.

[7] The Chicago Public Education Fund made a grant to the Grow Network to provide intensive professional development around Grow use in 12 elementary schools. We found *Teacher Use of and Belief in Grow* to be relatively high in these schools, placing them, on average, in the top quartile of Grow use schools.

This is the sixth in a series of research data briefs designed to provide new data on a particular issue. As the name suggests, this is a short report focusing on a single topic. Because data briefs are not comprehensive studies, we limit our discussion on findings to summarizing the key results.

This data brief reflects the interpretations of the authors. Although the Consortium's Steering Committee provided technical advice and reviewed an earlier version, no formal endorsements by these individuals, their organizations, or the full Consortium should be assumed.

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Sandra Jennings, Associate Director
Melissa Dean, Publications Editor
Kumail Nanjiani, Webmaster
Patricia Collins, Project Assistant

Consortium on Chicago School Research

Mission

The Consortium on Chicago School Research aims to conduct research of high technical quality that can inform and assess policy and practice in the Chicago Public Schools. By broadly engaging local leadership in our work, and presenting our findings to diverse audiences, we seek to expand communication between researchers, policy makers, and practitioners. The Consortium encourages the use of research in policy action, but does not argue for particular policies or programs. Rather, we believe that good policy is most likely to result from a genuine competition of ideas informed by the best evidence that can be obtained.

Founded in 1990, the Consortium is located at the University of Chicago.

Consortium on Chicago School Research
1313 East 60th Street, Chicago, IL 60637
773-702-3364 fax -773-702-2010
www.consortium-chicago.org