Cargill Core Knowledge Connection:

Evaluation findings in the third year

FEBRUARY 2006

Cargill Core Knowledge Connection:

Evaluation findings in the third year

February 2006

Prepared by:
Ellen Shelton

Wilder Research
1295 Bandana Boulevard North, Suite 210
Saint Paul, Minnesota 55108
651-647-4600
www.wilder.org

Contents

Figures

Acknowledgments

The research team wishes to thank Toni Green, Program Officer of the Cargill Foundation, and Matthew Brandt, Eden Bart, and Connie Skildum of the Minnesota Humanities Commission, for their help in implementing this evaluation. Thanks are also due to the Principals and Directors of the participating schools for taking the time to meet with the research staff for interviews, and we are grateful to the teachers in these schools for their time in completing mid-year and end-of-year questionnaires. Their thoughtful responses have provided important insights into how the Cargill Core Knowledge Curriculum is being implemented and how it is being received by the children it is intended to benefit.

We also thank David Heistad and Alex VandenBerk of the Minneapolis Public Schools, Office of Research, Evaluation, and Assessment, for their analysis of standardized test scores for Core Knowledge students at Dowling and Longfellow schools.

The following staff members of Wilder Research contributed to this report:

Jacqueline Campeau
Marilyn Conrad
Thalia Cooper
Michelle Decker Gerrard
Louann Graham
Greg Owen
Brian Pittman
Ben Shardlow
Karen Ulstad

Summary

Background

The Cargill Core Knowledge Connection is an initiative, funded by the Cargill Foundation and administered by the Minnesota Humanities Commission, to help nine Minneapolis-area elementary schools and preschools introduce the Core Knowledge curriculum. Six schools began their implementation in September 2002, and three others began in 2003 (including one preschool that was discontinued at the end of that year). The participating schools include:

- Two Minneapolis public schools (Dowling Urban Environmental School and Longfellow Elementary School)
- Three charter schools (Carter G. Woodson Institute of Student Excellence, or WISE; Excell Academy for Higher Learning; and Twin Cities International Elementary School, or TIES)
- One alternative school (Urban League Academy Elementary School)
- Three preschools (Longfellow's "Hi-5" preschool; Elim Nursery School; and Urban League Academy's "Hi-5" preschool, now discontinued)

This third-year evaluation report provides an update, as of the end of the 2004-05 school year, on the progress of implementation at each school, together with insights on factors that have affected the success of implementation, and some indicators of how the use of Core Knowledge may affect students' interest and learning. With the grants to the first round of schools expiring in December 2005, the report also assesses the intention and preparedness of these schools to sustain the implementation of Core Knowledge following the end of the grant period.

Methods

Evidence for the evaluation comes from five main sources: interviews with the principals or directors of each school; surveys of teachers at the two Round 2 schools in February and again in May; focused discussions with Humanities Commission staff at the end of the school year; and an analysis of test scores for students in the two Minneapolis public schools, conducted by the staff in the district's Office of Research, Evaluation, and Assessment. In addition, research staff consulted schools' proposals and reports to the Humanities Commission, and the Humanities Commission's regular reports to the Cargill

Foundation, for background information and further perspective on information gained from the other sources.

Findings on student achievement

The analysis of student test scores found significant gains in math achievement for Core Knowledge students compared to other students in the Minneapolis school district. Overall reading scores were not significantly better for Core Knowledge students. However, in a separate analysis of scores on the Oral Reading Assessment given only to first graders, scores for Core Knowledge participants were slightly higher than those for non-participants, indicating a possible positive impact for Core Knowledge. In addition, analysis of Kindergarten tests (which assess some reading skills, but no math skills) also provide some evidence of an advantage for students who attended the Core Knowledge Hi-5 program.

More qualitative findings on student enthusiasm and learning

In each of the first two years of implementation, teachers in participating schools were asked to comment on the extent to which they observed differences in their students' response to instruction as a result of the use of Core Knowledge. After discounting the possible influence of year-to-year differences among students, a conservative estimate of the impact of Core Knowledge for the Round 2 schools in their second year of implementation shows a modest positive impact on student enthusiasm, but minimal or no effect on attentiveness, quality of homework, classroom engagement, or cooperation. These results are lower than for the Round 1 schools in their second year. However, they appear to be related mainly to the difficulties involved in serving a very challenging population of students, rather than to problems relating more directly to Core Knowledge itself.

At the two Round 2 schools surveyed in 2004-05, one-quarter of teachers (24%) reported that "students with prior Core Knowledge experience are better able to connect facts to their own lives," and slightly over one-third (38%) reported that "students with prior Core Knowledge experience have a higher level of factual knowledge." No teachers disagreed with either of these statements; the remaining teachers selected the "neutral" response to these statements. Furthermore, these results are more positive among teachers with more experience using Core Knowledge, giving some evidence for gains as teachers and students acquire greater experience with the curriculum.

Other school outcomes

Based on interviews, teacher surveys, and document analysis, this evaluation found that:

- Almost all of the Round 1 schools were meeting their goals for implementation by the end of the third year (in terms of the amount of Core Knowledge being taught, in the content areas planned).

- Teachers in four of the five Round 1 schools are showing a significant level of commitment to, and investment in, the use of the Core Knowledge curriculum. At the remaining school, the Humanities Commission staff do not perceive the same level of commitment, but the school administration reports that teachers there strongly support the curriculum.

- According to principals and teachers, parents in the participating schools are not highly aware of "Core Knowledge" by name, as a specific curriculum or philosophy of education, but are relatively familiar with the kinds of content being taught. Principals report that parents are pleased with the amount and kind of learning their children are displaying.

- In all of the Round 1 schools, Core Knowledge has been institutionalized into the school's on-going operations in at least one way. These include organizational structures for planning and monitoring content to be taught (annual curriculum mapping), routinely screening candidates for professional positions based on their Core Knowledge experience, organizing school schedules to facilitate common planning time for teacher teams, and instituting accountability structures that incorporate teachers' reports of content covered, instructional methods used, and/or reflections on the effectiveness of lessons. Most Round 1 schools have incorporated most of these practices, indicating high chances for successful continuation of Core Knowledge after the end of the grant period.

Findings on implementation

Level of implementation (amount of Core Knowledge content taught)

Each participating school proposed a unique implementation plan for the three years of the grant period. Some intended by the end of the grant to fully implement the entire Core Knowledge scope and sequence, while others (including the Minneapolis public schools) chose to adopt only selected subject areas. Some chose to start with only one or two subject areas and/or grade levels and add others gradually, while others expected to implement the entire scope and sequence in the first year.

Based on teachers' reports of Core Knowledge units taught during the year, most schools have maintained relatively high levels of Core Knowledge use from 2003-04 to 2004-05. In schools where new content was introduced gradually, the overall amount of Core Knowledge being taught appears to have stabilized in the earlier subject areas and continues to grow in the newer ones. In schools that started all at once, the amount of content shows more fluctuation. It appears that some downward adjustments have been made to try to keep expectations manageable. Based on spring surveys, the median estimate given by teachers in the Round 2 schools is that around 20 to 30 percent of classroom instructional time was spent on Core Knowledge in the last three months of the third school year of implementation. The level of implementation appears to be in line with schools' plans.

Factors affecting implementation

Staff factors. Full implementation of Core Knowledge requires that teachers have a minimum level of understanding of the goals of the curriculum and its scope and sequence, knowledge of the content matter that they are responsible for teaching, and familiarity with appropriate options for assessing students' progress in mastering that content. Teachers without prior training and experience in Core Knowledge may require a significant amount of time and effort to acquire this new understanding and knowledge, which can involve a significant professional shift of gears. Successful implementation thus also depends on teachers' being committed enough to the curriculum to be willing to invest their time and energy in making this transition.

In all of the participating schools, the additional year of experience with Core Knowledge has resulted in strengthening of each of these factors. In particular, principals at Round 1 schools all report that teachers' commitment to Core Knowledge has been an important reason for the successful implementation at their school. Reflecting their one fewer year of participation, Round 2 schools are not as far along, but appear to be at a stage comparable to where Round 1 schools were in their second year.

Resource and structure factors. The staff factors depend not only on professional development, but also on the availability of resources and structures to support the effective use of individual teachers' knowledge and skills. These include a resource collection of relevant instructional materials, the regular availability of common planning time, and the completion of a thorough process of curriculum alignment, in which the new curriculum is compared to previous curriculum and to applicable district and state standards, as well as compared and integrated to different grade levels and disciplines within the school.

In most schools, a strong foundation of resource materials has been acquired and made accessible to teachers, although two schools continue to struggle somewhat both with acquisition and availability. Common planning time is in place in all schools but one, although it is less helpful in the smaller schools where teachers do not have grade level peers to work with. Most schools have done the larger curriculum mapping in comparison to prior curriculum and/or standards. Among all Round 1 schools but one, there is considerable evidence of integration of curriculum between grade levels and across disciplines. In the remaining school, there is evidence of progress in this kind of integration.

School leadership. The leadership, support, and accountability that a school's principal or director provides to school staff is another important factor affecting the level of Core Knowledge implementation. In some schools, the direct work of monitoring implementation has been done by the principal, while in others it has been delegated to an administrative aide or to leaders among the staff. These differences have been unimportant compared to the overall effectiveness of the principal in taking responsibility to ensure that there is a clear vision for Core Knowledge's importance to the school, and for the development and implementation of plans for accomplishing the implementation, and processes for assessing and adjusting how these plans are carried out.

The key nature of the leadership role is seen in observable differences between schools in implementation levels. Implementation, as measured by the other factors already discussed, is considerably more advanced in schools where a clear vision for Core Knowledge has been articulated; where this vision has been matched with implementation plans that are shared and regularly discussed with staff, and where there is regular follow-up to see that they are being carried out; and where schedules have been developed to ensure that teachers have time with each other for common lesson planning.

Parent and community awareness and involvement. Compared to work to familiarize school staff with Core Knowledge, relatively little effort has been made to acquaint parents with the Core Knowledge curriculum and philosophy. However, all of the Round 1 schools report numerous Core Knowledge-related events to showcase students' work for parents. One principal reported that "most parents wouldn't know the name 'Core Knowledge,' but they're fairly aware of what content is being covered," and another reported that "parents are always blown away by the content" their children are learning.

Other factors related to implementation level

Training. A key lesson learned in the first two years of the initiative has been the importance of tailoring professional developmental to the specific needs and interests of each school. Round 1 principals generally report that they feel the Humanities Commission has managed this responsiveness very successfully. One Round 2 school

continues to feel that their training needs are not well understood. For this school, the tension around the issue of training appears to be related to differences between the school leadership and the Humanities Commission in the relative priority of specific Core Knowledge content compared to other more basic training needs of a relatively young and inexperienced staff; and differences in perceptions of the role and importance of artwork in the curriculum and in the culture of the school and its families.

Other technical support. Besides the training opportunities, other supports offered by the Humanities Commission in 2004-05 included "roundtables" in January to connect teachers with grade-level peers from other schools in the initiative; a limited amount of opportunity to connect with other Core Knowledge schools outside the initiative; and a variety of other supports individualized to a school or specific teacher.

"The roundtables were fabulous," according to the principals. "The teachers loved them," especially those from the charter schools which, as smaller institutions, are less likely to have grade-level peers for teachers. There is some hunger among initiative participants for more connections to other Core Knowledge schools, and especially to those that are further along in implementation. On the other hand, schools report finding limited value in attending the national conference, to which they can afford to send only a small number of staff; they prefer to use limited funds on opportunities that can be more widely shared.

Individualized help provided by the Humanities Commission included helping teachers at several schools find and use resource materials for specific units, helping one school obtain specialized support to develop plans for integrating Black History with the Core Knowledge curriculum, and providing structure and accountability for overall Core Knowledge planning and curriculum mapping at a third school. These have been perceived as helpful.

There is some difference of opinion on the relative importance and value of the Humanities Commission's technical support, compared to the cash grants provided by the initiative. The work of the Humanities Commission staff has shown an evolving sense of how to achieve the delicate balance between supportiveness and directiveness. This has been greatly facilitated this year by the greater degree of stability in project staffing at the Commission, and the staff's consequent ability to develop and build on good relationships with the schools.

Main challenges reported by schools

The implementation of Core Knowledge has been affected by a number of other factors that are less subject to control by the terms of the grant or the support of the Humanities Commission than those outlined above.

Student mobility. Schools in the initiative have relatively high turnover among students both within and between years, eroding the validity of the premise that content taught in one year can be built upon in following years. Schools typically address this challenge by using some instructional time for review, to an extent greater than presumed in the Core Knowledge philosophy.

Staff mobility. Some schools have also experienced high levels of turnover among staff, due sometimes to district budget cuts, layoffs, and re-assignments, sometimes to expansions in grade levels or sections per grade, and sometimes to school-level fiscal or administrative difficulties. Many of the schools in the initiative respond to this challenge by requiring applicants for teaching positions to either have experience with Core Knowledge, or to be committed to learning and using it.

No Child Left Behind testing requirements. The No Child Left Behind (NCLB) Act has resulted in a high emphasis on basic reading and math skills in order to meet school testing requirements in those subjects. As a result, some schools have intensified their curricular emphasis on math and reading, making harder to devote time – for professional development, planning, or classroom instruction – to the subject areas in the humanities in which Core Knowledge specializes. This effect was seen mainly in the public schools, including the alternative school that is accountable to the public school district by virtue of its contract. The charter schools, by contrast, reported less loss of instructional time or staff emphasis due to the NCLB testing requirements.

Time required to introduce Core Knowledge. The implementation of Core Knowledge requires time in a number of different ways. First, it needs a substantial amount of instructional time to incorporate all the content into the classroom schedule. Second, the staff need a considerable amount of professional development time to gain new skills. Third, on-going staff time is needed for the common planning and preparation that are important in maintaining the needed curricular integration. The initial investment in professional development is now being reflected in greater levels of comfort and confidence among teachers in the use of the curriculum, easing the second of these concerns. In all but one of the Round 1 schools, the first and third (instructional and planning time) appear to be fully incorporated into school schedules in sustainable ways. The remaining Round 1 school, and the two Round 2 schools, continue to explore ways to make their schedules work to include the needed time.

Curricular adaptations. Schools, including highly-implemented Round 1 schools, continue to report that they are challenged by the need to adapt instructional materials, or the curriculum itself, to meet the needs of students. This reflects a scarcity of suitable materials at reading levels that are accessible to the children; materials and strategies for students with limited English fluency; and curriculum content that adequately reflects the

heritage and culture of African American and immigrant children.[1] Help addressing these needs has been one of the most common kinds provided by the Humanities Commission, and has been appreciated.

Cost of materials. Another recurring theme throughout the three years of the initiative has been the cost of implementing Core Knowledge, including not only professional development time but also instructional materials. For most schools, the grant has been enough to make this cost possible, and most of the Round 1 schools feel prepared to meet the remaining on-going expenses when the initial grant ends.

Issues to consider

The statistically significant gains in mathematics achievement, in the two schools where test results could be analyzed, are a welcome indication of successful implementation. The assessment of implementation indicators suggests that at least one other Round 1 elementary school has likely reached a similar level of implementation by the end of its third year.

Moreover, schools that have reached this level of implementation of Core Knowledge appear well-prepared to sustain their implementation beyond the end of the grant period. The experiences of the Cargill Core Knowledge Connection to date confirm the study's hypothesis that the following are important considerations in attaining a successful, sustainable level of implementation:

- School leadership that is both committed to the curriculum and effective in promoting it with the staff and monitoring staff implementation.
- The establishment of effective processes within the school to ensure that adequate and appropriate new resources are acquired and made available to the teachers.
- The establishment of effective processes within the school to ensure that teachers have time to plan jointly with others, at multiple levels: among grade level peers (where available) for individual classroom lessons, with other teachers who also teach the same children in the same year (such as music or physical education specialists), and with teachers in other grades whose content precedes or follows their own in the overall, multi-year sequence.

[1] Cultural appropriateness for American Indian children is also a concern for at least one school. That school has found ways to address this issue, which has not been as great a need in the other schools.

In addition, the experiences of the participating schools suggest three other tentative conclusions about successful implementation:

- It appears to be more effective to introduce the new Core Knowledge curriculum gradually, a few subject areas per year, instead of all at once in the first year.

- To help them in learning the new curriculum and the new ways of teaching and supporting it that are needed, principals and teachers find it valuable to have opportunities for personal observation and mentoring with peers in other schools who have greater experience using Core Knowledge.

- The most helpful training, or other kind of support, is highly individualized to the specific mix of circumstances in a given school at a given time.

There is some irony in the importance of this last theme, given the Core Knowledge philosophy that the most powerful and effective curriculum is one that is the same for all. However, at a deeper level, the theme replicates other lessons learned about Core Knowledge implementation, which have included the persistent theme, across schools, that the specific materials and strategies used to teach the common curriculum required considerable effort to tailor to the cultural backgrounds, English language fluency, and reading levels of the students. In addition, the school-to-school differences, which include different levels in teachers' experiences and skills, mirror the difficulties the teachers themselves often face working with classes of highly mobile students with variable – and sometimes unknown – prior levels of knowledge.

Solutions to staff and student mobility lie beyond the scope of the Cargill Core Knowledge Connection. However, the test score results from the public schools in the third year of implementation provide a welcome suggestion that this mobility does not negate the effectiveness of the curriculum, even when only selected subject areas within it are highly implemented.

Background

The Cargill Core Knowledge Connection was initiated during the 2001-2002 school year. The Cargill Foundation and the Minnesota Humanities Commission invited elementary schools and preschools in Minneapolis and its suburbs to apply for three-year grant funding and technical support to begin to implement the Core Knowledge curriculum. Two rounds of grants were awarded, in successive years, to the following nine schools:

- Two Minneapolis public schools:
  - Dowling Urban Environmental School (Round 1, beginning 2002)
  - Longfellow Elementary School (Round 1, beginning 2002)
- Three charter schools:
  - Carter G. Woodson Institute of Student Excellence, also known as WISE (Round 1, beginning 2002)
  - Excell Academy for Higher Learning (Round 1, beginning 2002)
  - Twin Cities International Elementary School, also known as TIES (Round 2, beginning 2003)
- One alternative school:
  - Urban League Academy Elementary School (Round 2, beginning 2003)
- Three preschools:
  - Longfellow Elementary School's "Hi-5" preschool program (Round 1, beginning 2002)
  - Elim Nursery School (Round 1, beginning 2002)
  - Urban League Academy's preschool (Round 2, 2003-2004 only; discontinued after the first year due to public funding cuts)

To help defray costs of implementation, the Cargill Core Knowledge Connection awarded each elementary school $10,000 to start the first year, and $5,000 for each preschool. The full grant period covers three years of implementation, with a fourth annual payment at the conclusion of the third year; the grants over this period total $40,000 per elementary school and $15,000 per preschool.

The Core Knowledge curriculum is based on the premise that effective elementary education requires a foundation in a specified body of common knowledge to be learned by every student, in a coordinated, grade-by-grade sequence. It seeks to ensure that students in any given grade can be assumed to share common knowledge and concepts

introduced in previous grades. As a result, less time is needed for review, and more time can be devoted to building on that common foundation with new learning. In promoting the curriculum, its developer, E.D. Hirsch, has argued that the specific, shared curriculum promotes not only greater student learning (including higher literacy) but also greater fairness, as it makes fewer assumptions about knowledge to be picked up from sources outside of the school.

The specific content of this core curriculum is outlined in two books, the *Core Knowledge Preschool Sequence* and the *Core Knowledge Sequence, K-8,* as well as in the more widely read series of books *What Your First Grader [Second Grader, etc.] Needs To Know.*

The Core Knowledge curriculum is a good fit for the Cargill Foundation's strong commitment to promoting student academic achievement in Minneapolis and its western and northern suburbs. Prior to this specific initiative, the Minnesota Humanities Commission was already actively engaged in supporting the use of the curriculum in Minnesota, in part because of the curriculum's strong humanities components.

Activities of the initiative to date

In their applications to the Cargill Core Knowledge Connection, schools were encouraged to present specific plans for implementation tailored to their own school's needs and circumstances. They were expected to begin gradually, with selected grades and/or subject areas, and take up to the full three years to reach full implementation. In discussions with authorities in the Minneapolis Public Schools, it was agreed that Core Knowledge implementation in the public elementary schools would not displace or disrupt the district's own common reading and mathematics curriculum for the participating public and alternative schools.

In the first year of the initiative, in 2002-2003, the different contexts of the six Round 1 schools made for six different sets of goals and strategies. In terms of pace and focus, no two schools took the exact same approach. As a charter school in its first year of operation, WISE set specific goals for subject areas to cover, and worked to meld the content of Core Knowledge with its institutional focus on African culture and history. As another young charter school, Excell Academy had partially implemented Core Knowledge during the previous school year and sought to use that experience as a springboard to cover as much material as possible in several content strands. In contrast, Dowling and Longfellow are established public schools with other curricula in place and experienced teachers on staff, so both schools chose to implement the curriculum more gradually – Dowling with some activity in four different strands, Longfellow with a focus on Language Arts and Music. Longfellow's Hi-5 program shared the implementation goals of the school overall, but used the separate Core Knowledge Preschool Curriculum

to do so. And Elim, a private preschool with limited classroom hours and a small teaching staff, wanted to implement parts of Core Knowledge as a way to reinforce existing teaching practices and methods.

In 2003-2004, the three new Round 2 schools introduced their own entirely new contexts and approaches. TIES is a charter school serving a student body composed almost entirely of recent Somali immigrants; unique features for this school thus include a school culture reflecting the Muslim faith of its families, as well as instructional issues relating to children's low familiarity with the English language and their parents' low literacy levels. The Urban League Academy is an alternative school with a relatively inexperienced staff, offering its educational program under a contract with the Minneapolis Public Schools. Its preschool, also operated and funded through the Minneapolis district, was one of many Hi-5 programs in the district to be cut due to the loss of state funding. Both schools were in their second year of operation when they entered the Cargill Core Knowledge Connection. TIES had used the Core Knowledge curriculum on its own in its first year; Urban League Academy had not. Both schools' plans called for implementation of all areas of the curriculum immediately.

The 2004-2005 school year was the second year of implementation for the Round 2 schools, and the third year (and last full year) for the Round 1 schools, whose grant periods end in December 2005.

This report provides an update, as of the end of the 2004-05 school year, on the progress of implementation at each school, as well as insights into factors that have affected the success of implementation, and information as available on indicators of how the implementation of the Core Knowledge curriculum may affect children's interest in and mastery of knowledge and skills.

Evaluation design and methods

Wilder Research was invited to evaluate the Cargill Core Knowledge Connection to help the Cargill Foundation and Minnesota Humanities Commission learn the answers to three main research questions:

1. What evidence is there that schools are fully implementing Core Knowledge?

2. What evidence is there that students may achieve higher academic performance when Core Knowledge is fully implemented?

3. What use have schools made of the training and on-going support available from the Minnesota Humanities Commission, and how satisfied have they been with it?

Wilder designed the evaluation based on findings from a prior national evaluation of Core Knowledge implementation in public elementary schools conducted by researchers at Johns Hopkins University using matched comparison schools. The Johns Hopkins study examined not only student achievement outcomes, but also the contexts and conditions that affected the success of implementation. Where it occurred, full implementation typically developed over a three- to five-year period. The evaluation found that schools achieving high implementation showed significant improvements over non-Core Knowledge schools in student test scores in the subject areas covered by the curriculum. For more general tests, such as statewide or nationally normed achievement tests, more fully implemented Core Knowledge schools had somewhat better scores than lower-implementing Core Knowledge schools. Because of the variation in the levels of implementation schools achieved, the overall group of Core Knowledge schools had test scores similar to those of the overall group of comparison, non-Core Knowledge schools.

This evaluation of the Cargill Core Knowledge Connection is based on the findings of the Johns Hopkins study, and focuses mainly on the factors that study found to be related to successful implementation by the end of the three-year grant period. In order to track the progress made by each school year-by-year, Wilder developed a logic model (found in the Appendix) that combines the activities included in participating schools' grant proposals with the Johns Hopkins factors of successful implementation. The logic model outlines an expected sequence of interrelated activities, outputs, short-term outcomes, and long-term outcomes, and represents a theory of what it takes for schools to successfully implement Core Knowledge. The model represents not only how Core Knowledge is taught in individual classrooms, but how that teaching is coordinated and supported both within each school and by the Minnesota Humanities Commission.

The factors of successful implementation addressed in the logic model include:

- **Teacher planning and preparation:** Records of content implemented, common planning time, an annual plan for content implementation, and alignment of Core Knowledge with other curricula
- **Resource organization and acquisition:** Current resources are inventoried, and new resources are acquired
- **School leadership:** Principal[2] supports and provides leadership for planning and instruction
- **Community participation and support:** Basic awareness of Core Knowledge among parents and other community members
- **Staff training:** Training modules and technical assistance provided by the Minnesota Humanities Commission

As illustrated in the logic model, data relating to these factors are collected at appropriate stages in each school's implementation of Core Knowledge by either the Humanities Commission, as a function of their grant monitoring activities, or Wilder, as part of the evaluation, or both.

Methods

This third-year progress report is based on five main sources of information:

- **Principal interviews:** Wilder research staff conducted a one-on-one, face-to-face interview at the Round 2 schools in February, and at the Round 1 schools in May. The interview focused on the school's organization to support implementation, successes and obstacles to date and expectations for the remainder of the year, and perceptions of the training and support provided by the Humanities Commission. For the Round 2 schools, it also included questions about the school's readiness to sustain the implementation of the curriculum when their grant period ends in December 2005. Round 1 interviews included questions about the school's plans to continue the use of Core Knowledge after the grant, and preparedness to do so. On average, interviews lasted approximately 45 minutes.

[2] At the participating public schools, the administrative and academic leader is the principal; at the charter schools and preschools the person in this position is the director. For simplicity in this report, we use the term "principal" when referring to both.

- **Teacher mid-year survey:** In February, Wilder research staff administered a four-page, paper-and-pencil self-administered questionnaire with 17 closed-ended questions, three required open-ended questions, and four optional open-ended questions. This was distributed in Round 2 schools to each teacher identified by the principal as having used Core Knowledge in the classroom during the year. In the two Round 2 schools, 23 of 24 teachers completed the surveys and mailed them back directly to Wilder in pre-stamped, preaddressed envelopes. This represents a response rate of 96 percent of eligible respondents.

- **Teacher end-of-year survey:** In May, Wilder research staff also administered to the same Core Knowledge teachers in Round 2 schools a four-page, paper-and-pencil self-administered questionnaire with 12 closed-ended questions, one required open-ended question, and two optional open-ended questions. Again 23 teachers (96%) completed the surveys and mailed them back directly to Wilder in pre-stamped, preaddressed envelopes.

- **Focused discussion with Humanities Commission staff:** In March, Wilder research staff met with the two Humanities Commission staff members who work directly with participating schools, in order to discuss the training and support services provided over the past year and learn more about the schools from their experiences providing those services.

- **Analysis of student test scores:** In the summer of 2005, staff in the Minneapolis Public Schools, Office of Research, Evaluation, and Assessment, analyzed the test scores of students enrolled in the Round 1 schools in the Minneapolis Public School district (Dowling and Longfellow K-5 students, and Longfellow Hi-5 students). Students' gains from 2004 to 2005 were compared to the same students' gains from 2003 to 2004. In addition, the 2004-2005 gains for Core Knowledge students were compared to 2004-2005 gains for comparable students in other Minneapolis schools who had not been exposed to the Core Knowledge curriculum.

The following other sources of information were also consulted for background information and to shed further light on researchers' and school staff members' perceptions and interpretations:

- The original grant proposals from the participating schools

- Reports and Curriculum Checklists submitted to the Humanities Commission by the schools, and reports submitted by the Humanities Commission to the Cargill Foundation, describing implementation activities and challenges

Information from the interviews and documents were prepared in the form of detailed typed notes and analyzed using ATLAS analytical software. Data from the mid-year and end-of-the-year teacher surveys were entered by Wilder staff into a data base, from which research staff computed frequencies, cross-tabulations, and correlations using SPSS statistical software.

Note on evaluation findings for preschools:

Longfellow Elementary School and (in its first year) Urban League Academy both included elementary and preschool programs within a single building, faculty, and administrative structure. For the purposes of the evaluation, the elementary and preschool programs were counted as separate "schools," and the Core Knowledge preschool curriculum is published and supported separately from the grade school curriculum. However, some teachers and support staff worked in both programs within the same school, and the same principals were responsible for both. It was not always possible, in interview or survey responses, to separate information about the preschool and elementary programs. Implementation issues for the Longfellow Hi-5 program appear to have been the same as for the elementary grades in the school, and are not singled out for separate mention in this report. Since the Urban League Academy preschool was no longer operating in 2004-05, Elim Preschool is therefore the only preschool mentioned separately in this report.

Findings on outcomes

This evaluation measures the effects of Core Knowledge implementation on students in a variety of ways. Finally, for the first time this year, at the end of the third year of implementation, Minneapolis Public School children's standardized test scores were compared to the test scores that would be expected for children of comparable demographics in comparable Minneapolis Public Schools. Second, principals were asked to report their impressions of students' responses to the curriculum. Third, teachers were asked to report whether they felt that students who had been exposed to Core Knowledge were different from other students in specified ways. Finally, teachers were asked to compare students' classroom behaviors during Core Knowledge lessons with the same children's behaviors during lessons in comparable materials when other curriculum was used.

Student outcomes

Quantitative data on student test results

At the end of the third year of implementation for the public elementary schools (2004-2005) the Office of Research, Evaluation and Assessment of the Minneapolis Public Schools examined the standardized test scores in reading and mathematics for students in the participating Minneapolis elementary schools (Dowling and Longfellow). They also compared those scores with the scores of a stratified random sample of comparable children in other elementary schools in the district. In both cases, the analysis was restricted to students continuously enrolled for two years, ensuring that the 2005 scores could be compared to 2004 scores. In addition, they examined the Kindergarten Assessment results of the previous year's Longfellow Hi-5 students in two reading domains (phonemic awareness and alphabetic principles), and compared those results to the expected results for comparable children. Their report of this analysis is included in full in the Appendix to this report.

In brief, the results of this analysis show that students in the Core Knowledge schools (Dowling and Longfellow) made significantly more progress in math than comparable students in other Minneapolis elementary schools. The comparison of reading test results did not show a significant difference for the Core Knowledge schools. However, in a separate analysis of results on an Oral Reading Assessment given only to first graders, the results for Core Knowledge participants were slightly higher than those for non-participants, at a level that was not statistically significant but suggests the possibility of some positive Core Knowledge effect.

A closer examination of the improvements in math scores shows that the gains for Core Knowledge students were found for both of the grades for which two years of tests are available (grade 4 compared to grade 3, and grade 5 compared to grade 4), and for both of the schools (Dowling and Longfellow). (There are no reliable measures of math skills for younger students.)

A final analysis examined the effects of shorter or longer exposure to the Core Knowledge curriculum. Results were examined separately for students who were continuously enrolled in Core Knowledge schools for one, two, or three years. This analysis found that the number of years of exposure was not a significant predictor of improvement in academic achievement. However, the results did suggest that there may have been some benefit for Kindergarteners from attending a Core Knowledge Hi-5 program.

A final finding from the analysis of test scores shows that gains from 2004 to 2005 in math and reading were not significantly different from those from 2003 to 2004. This suggests no additional gains in the third year of implementation beyond those already evident in the second year (or none large enough to be statistically significant).

The Minneapolis research staff conclude that, "Understanding why there was an effect for math achievement but not reading requires additional investigation into the program." However, the findings are consistent with other research on school change nationally. One recent study that also found results for math but not reading reported that there were "many recent studies of academic interventions noting more positive and pronounced outcomes in mathematics than in literacy."[3]

It is noteworthy that the key subject areas measured in the Minneapolis tests, reading and math, are precisely the two strands of the Core Knowledge curriculum that were specifically excluded from implementation in the Minneapolis public schools that participated in the initiative. Furthermore, the Core Knowledge implementation may have affected reading somewhat more closely than math, in that the public schools did implement many elements from the literature components of Core Knowledge. However, the finding that math scores were significantly higher for Core Knowledge students suggests the possibility that some more basic cognitive skills were developed that were effectively transferred to the content involved in the standardized math tests.

[3] Page 219 of Smith, B., Roderick, M., & Degener, S.C. (2005). Extended learning time and student accountability: Assessing outcomes and options for elementary and middle grades. *Educational Administration Quarterly, 41*(2), 195-236.

Qualitative data on student enthusiasm and learning

In a variety of schools, with differing levels of implementation, principals and teachers offer anecdotal descriptions of heightened student interest and mastery as a result of the use of the Core Knowledge curriculum. On the spring survey, a first grade teacher at Urban League volunteered the comment that "The students are excited when they relate new knowledge with something learned previously. For example, during the Mexico unit they brought up a discussion about continents and even talked about the earth (core, mantle, crust). They would not have had that information if we had not covered it earlier." In the interviews with Round 1 principals at the end of the third year of implementation, the Dowling and WISE principals reported that children are highly interested in the content material, and the Longfellow principal reported that she is seeing the benefit of the common content knowledge in sparking a love of learning in the students in her school.

In the survey of teachers at Round 2 schools in the middle of their second year of implementation, TIES and Urban League teachers agreed with or were neutral about the statements that "students with prior Core Knowledge experience have a higher level of factual knowledge," and "students with prior Core Knowledge experience are better able to connect facts to their own lives." No teacher disagreed with either statement. In addition, Urban League teachers also agreed more than they disagreed with the statement that "students with prior Core Knowledge experience do better work in the classroom." Figure 1 below gives the full results of these teacher survey items for Round 2 teachers in 2004-05.

1. Impact of previous Core Knowledge experience on student performance

"Students with prior Core Knowledge experience…	…have a higher level of factual knowledge."			…do better work in the classroom."			…are better able to connect facts to their own lives."			…are no different from other students when it comes to classroom participation"		
	Agree	Neutral	Disagree	Agree	Neutral	Disagree	Agree	Neutral	Disagree	Agree	Neutral	Disagree
TIES (n=16)	6	10	0	3	11	2	3	13	0	5	8	3
Urban League (n=5)	2	3	0	2	3	0	2	3	0	0	4	1
Overall (n=21)	**8**	**13**	**0**	**5**	**14**	**2**	**5**	**16**	**0**	**5**	**12**	**4**
Overall (%)	**38%**	**62%**	**0%**	**24%**	**67%**	**10%**	**24%**	**76%**	**0%**	**24%**	**57%**	**19%**

Source: *Winter teacher survey (February 2005).*

Note: *Two first-year teachers did not answer these questions.*

Teachers who had more experience with Core Knowledge were more likely to agree that students exposed to Core Knowledge had higher levels of factual knowledge. Among first-year Core Knowledge teachers, only 45 percent agreed; among teachers with one previous year of experience, 58 percent agreed; and among teachers with two or more previous years of experience, 67 percent agreed. Since many teachers in the initiative were introduced to Core Knowledge at the same time as students were, it is possible that this increase reflects growth in students' experience with Core Knowledge – and in the depth of their factual knowledge – as well as teachers' greater familiarity with the curriculum.

Teachers in the Round 2 schools were also surveyed at the end of the year about students' responses to Core Knowledge instruction compared to their responses to comparable material when delivered through other kinds of instruction. In 2003-04, we found that teachers' reports of student response in the first year of implementation in Round 2 schools were less positive than they had been for students in the first year in Round 1 schools. Again in 2004-05, comparing responses after the second year of implementation for the two rounds of schools, we observed the same pattern of less positive student responses at the Round 2 schools. Using the same conservative estimate of Core

Knowledge impact[4] on student attentiveness, enthusiasm, quality of homework, classroom engagement, and cooperativeness, the amount of impact due to the use of Core Knowledge is small in the Round 2 schools compared to those reported by teachers in the second year in Round 1 schools. In addition, while the direction of impact in Round 1 schools was uniformly positive, in Round 2 schools it is a mixture of positive and negative. As with Round 1 schools, the Round 2 results for the second year of implementation do not appear to be meaningfully different from those for the first year.

Some of this difference may be related to the level of instructional challenge that Round 2 teachers face in their classrooms, given their student populations. In each of the first two years of implementation, teachers were asked to compare their current students to students in previous years on each of the five measures of interest. In the first year, Round 1 teachers rated their students as slightly less attentive than previous students, but slightly more enthusiastic and engaged, and completing homework of higher quality. Second year comparisons for the same Round 1 schools were somewhat more evenly mixed between slightly positive and slightly negative comparison with previous groups of students. By contrast, Round 2 teachers in the first year rated their students as significantly less cooperative and completing significantly lower quality of homework than in previous years, and slightly less attentive and engaged. Only enthusiasm was rated slightly higher. In the second year of implementation, students were again rated below previous students, on average, this time in all five measures (and considerably below previous students in attentiveness).

Teachers were also asked each year to rate the responses of their students when they were using Core Knowledge compared to the responses of the same students when they were using a different curriculum. On this measure also the Round 2 teachers rate their student responses lower than the ratings given by Round 1 teachers. In both years, Round 1 teachers rated their students higher on all five measures when using Core Knowledge than when using other curricula. By contrast, in the first year of implementation the Round 2 teachers rated their students *lower* on three of the five measures (attentiveness, engagement, and quality of homework) when using Core Knowledge, and rated them as just equal on the other two. In the second year (the current year, 2004-05) the results were more positive, with the Core Knowledge ratings higher on all of the measures except quality of homework (which was neutral).

[4] A positive impact (score of +1) for a classroom is calculated if the teacher reports that the class rates higher on the measure (attentiveness, enthusiasm, etc.) when being taught with Core Knowledge than with another curriculum, and that the class does *not* rate higher on that same measure when compared with classes in previous years. A negative impact (score of –1) is calculated if the class rates lower on the measure when being taught with Core Knowledge than with another curriculum, and does *not* rate lower when compared with classes in previous years. Aggregate impact scores are the average of all individual classroom scores.

These results suggest that the Round 2 schools are working with a more difficult population of children, on average, than the Round 1 schools. This difference may explain some of the lower impact ascribed to Core Knowledge in the first and second years of implementation. However, the survey results also show that teachers are seeing slightly more positive responses to Core Knowledge from their children in the second year. Given the difficulties with implementation, including the number of teachers who were new to the schools in the second year, this change can be seen as a hopeful indication of an improving trend for these schools.

Figure 2 below summarizes these findings for the Round 2 schools in 2004-05. In the first set of three columns, the numbers show how many teachers rated this year's class as showing more of the indicated behavior, about the same amount, or less of it, when compared with previous years' classes. In the second set of columns, the numbers show how many teachers rated the class each way compared to the same class when using a different curriculum. The last set of columns shows, for teachers who answered both questions, how many pairs of answers reflect a positive impact for Core Knowledge, how many reflect no impact, and how many reflect a negative impact. The rightmost column (labeled "average score") shows the average across all teachers.

2. Student response to curriculum in second year of implementation

Type of student response	Compared to previous years' students			Compared to same class when using non-CK curriculum			Impact (computed) related to Core Knowledge			
	More	Same	Less	More	Same	Less	Positive	Neutral	Negative	Average impact score
Attentive	3	3	13	3	18	1	0	18	0	0
Enthusiastic	3	9	6	4	18	0	2	16	0	+ 0.11
Quality of homework	4	7	8	1	19	1	0	17	1	– 0.06
Engaged	2	12	5	5	17	0	1	17	0	+ 0.06
Cooperative	4	9	6	3	20	0	0	19	0	0

Source(s): *Wilder Research survey of teachers, May 2005.*

Note: *A total of 23 teachers answered the survey, but not all teachers answered each of the questions reflected in this table. Thus the totals for each set of three columns on a line may vary, and the totals also vary from line to line.*

Figure 3 below shows the calculated impact of Core Knowledge for the different groupings of schools (public vs. charter and alternative, Round 1 vs. Round 2) for the first two years of implementation.

3. Student response to curriculum: Comparison by type of school, year of implementation, and grant round

Type of student response	Year of implementation	Average impact (computed) (and number of teachers reporting) Round 1 schools: Public	Round 1 schools: Charter or alternative	Round 1 schools: Total	Round 2 schools: Charter or alternative
Attentive	First year	+ 0.29 (n=31)	* (n=3)	+ 0.29 (N=34)	– 0.10 (N=10)
	Second year	+ 0.18 (n=33)	+ 0.55 (n=11)	+ 0.27 (N=44)	0.00 (N=17)
Enthusiastic	First year	+ 0.48 (n=31)	* (n=4)	+ 0.49 (N=35)	– 0.10 (N=10)
	Second year	+ 0.24 (n=34)	+ 0.50 (n=12)	+ 0.30 (N=46)	+ 0.13 (N=16)
Quality of homework	First year	+ 0.09 (n=23)	* (n=2)	+ 0.16 (N=25)	0.00 (N=10)
	Second year	+ 0.04 (n=24)	+ 0.38 (n=8)	+ 0.13 (N=32)	– 0.06 (N=17)
Engaged	First year	+ 0.34 (n=32)	* (n=4)	+ 0.33 (N=36)	+ 0.17 (N=12)
	Second year	+ 0.18 (n=34)	+ 0.46 (n=13)	+ 0.26 (N=47)	+ 0.06 (N=17)
Cooperative	First year	+ 0.06 (n=33)	* (n=4)	+ 0.05 (N=37)	+ 0.08 (N=12)
	Second year	+ 0.09 (n=33)	+ 0.23 (n=13)	+ 0.13 (N=46)	0.00 (N=18)

Source(s): *Wilder Research survey of teachers, May 2005.*

Note: *Due to small numbers, preschools are not shown. *The number of Round 1 charter school teachers reporting in the first year of implementation was too small to calculate meaningful impact data for this group separately.*

Other school outcomes

In addition to student test results, other important outcomes of interest for the Cargill Core Knowledge Connection include:

- **Level of implementation:** Adoption of Core Knowledge content representing about 50 percent of overall classroom content (in those subject areas selected by the school)
- **Staff commitment to Core Knowledge:** Increased levels of involvement and satisfaction for teachers
- **Parent and community support:** Parent and community understanding and support of Core Knowledge and provision of volunteer resources to its implementation
- **Sustainability:** Schools' commitment to continuing Core Knowledge beyond the grant period, and identification of resources needed to do so

Data collected as part of the evaluation does not include systematic documentation on all of these additional outcomes. However, teacher surveys and curriculum checklists, and the interviews with Round 1 school principals and Humanities Commission staff at the end of the third year of implementation, provide the following information. More detail on the first three is given in the later section on implementation findings.

Level of implementation

The evidence, while somewhat mixed, suggests that almost all schools were meeting their goals for implementation by the end of the third year. The two public schools had more modest goals, and are using Core Knowledge for a smaller proportion of total instructional time than are the charter schools. However, they appear to be fully implementing those subject areas that they planned to offer. For reasons described in the implementation sections below, Excell was not meeting its original implementation goal by the end of the third year, but it hoped to reach its final implementation goal by the end of the grant period in December.

Staff commitment

Principals at all five of the Round 1 schools felt that their teachers were significantly invested in the Core Knowledge curriculum. Humanities Commission staff did not perceive this commitment at Excell, but otherwise agreed that there was strong support for the curriculum among the staff at the other Round 1 schools.

Parent and community support

According to teachers surveyed during the second year of implementation, parents tend not to be highly aware of "Core Knowledge," by that name, as a specific curriculum or philosophy of education. However, teachers and principals generally feel that parents are relatively familiar with the kinds of content being taught. All of the Round 1 schools hold numerous events to showcase students' work for parents, and report that the parents are pleased with the amount and kind of knowledge their children display.

The evaluation plan did not include measures of more general community support. However, principals at the two public schools report receiving other outside grants to support enrichment at their schools, which are integrated with the Core Knowledge work. In addition, TIES receives supportive services from a number of community organizations that complement and reinforce the Core Knowledge work of the school.

Sustainability and institutionalization

The institutionalization of Core Knowledge into a school's operations may be found in a variety of ways. It may be seen in organizational structures for planning and monitoring content to be taught and assessed (annual curriculum mapping), in routinely screening candidates for professional positions based on their prior experience with the curriculum or their willingness to master it, in school schedules that build in common planning time for grade level groups or other teacher teams, and in accountability structures that incorporate teachers' reports of content covered, instructional methods used, and/or reflections on the effectiveness of lessons.

All Round 1 schools have institutionalized Core Knowledge in at least one of these ways. WISE does year-long curriculum mapping each year, monitors and adjusts the annual curriculum plan every six weeks, and has a full-time Curriculum Coordinator to help oversee the Core Knowledge implementation. Excell has begun to screen new teacher candidates for their familiarity with Core Knowledge, and plans to have a Core Knowledge committee begin to meet monthly in 2005-06 to monitor the progress of implementation. Dowling and Longfellow both have embedded into their schedules time for joint staff planning of scope and sequence as well as lesson planning, have committees to help plan and oversee implementation, and have integrated the work of their specialists (art, music, and physical education) with that of the classroom teachers in Core Knowledge themes. In addition, Longfellow has made the transfer of new teachers into the school conditional on their commitment to learn and use Core Knowledge. Elim has built in team planning within and across the classroom teacher pairs, and the new principal has developed stronger accountability structures to ensure that the curriculum is implemented.

In those schools with effective leadership related to Core Knowledge (discussed below), the continued implementation of Core Knowledge beyond the grant period appears very likely (provided there are no countervailing outside influences such as major changes in the district's priorities). In the one Round 1 school without such leadership, the efforts of the Humanities Commission have contributed significantly to implementation success so far, in such respects as resource availability and curriculum alignment. However, despite the help from the Humanities Commission to accomplish some necessary tasks, this school continues to lack the on-going leadership needed to effectively build on these accomplishments, and may or may not be able to maintain them without continuing external support. For example, although common planning time is built into teachers' schedules at this school, interviews with the administrator and Humanities Commission staff suggests that this time is not as effectively used as in the other schools. As a result, teachers have learned less than they otherwise might have learned about the overall Core Knowledge curriculum's scope and sequence, how that fits within the standards their students must meet, what content other teachers in the school are teaching, and ways to teach their own class more effectively.

4. Summary of non-student outcome measures, by school

	Meeting school goal for amount of CK content taught	Staff commitment to Core Knowledge	Parent and community support	Institutionalization of structural features
Dowling	Positive	Positive	Positive	Positive
Longfellow	Positive	Positive	Positive	Positive
WISE	Positive	Positive	Positive	Positive
Excell	Somewhat positive	Somewhat positive	Positive	Mixed
Elim	Positive	Somewhat positive	Somewhat positive	Positive
TIES	Positive	Somewhat positive	Unable to rate	(Not assessed until third year)
Urban League	Somewhat positive	Somewhat positive	Somewhat positive	

Sources: *Interviews with principals and directors (winter and spring 2005), interviews with Humanities Commission staff (spring 2005), surveys of teachers (February and May 2005, Round 2 schools only), curriculum checklists (May 2005).*

Findings on implementation

This section of the report closely follows the sequence of elements in the logic model. After a description of the strands of curriculum implemented in each school, and the amount of instructional time devoted to Core Knowledge material, it first describes the factors associated with full implementation, as identified by the Johns Hopkins study:

- **Staff factors** (including familiarity with Core Knowledge goals and scope and sequence; familiarity with content to be taught; familiarity with assessment options; and attitude toward Core Knowledge)
- **Resource and structure factors** (including adequacy and availability of resource materials; common planning time for teachers; curriculum alignment; and curriculum integration)
- **School leadership**
- **Parent and community awareness and involvement**

Second, we report on other factors that appear to have a bearing on the success of implementation of the Cargill Core Knowledge Connection, including:

- **Trainings** offered by the Minnesota Humanities Commission
- **Other technical support** provided by the Humanities Commission
- **Internal and external challenges** experienced by the schools in implementation

Level of implementation of Core Knowledge

Implementation goals for 2004-2005

Each of the participating schools proposed a unique implementation plan for the three years of the Cargill Core Knowledge Connection grant period. The Minneapolis Public Schools required that the district's standard reading and math curricula be retained, so Dowling and Longfellow schools' plans focused mainly on Social Studies, the literature components of Language Arts, and, to a lesser extent, Music, Visual Arts, and Science. By contrast, the charter schools WISE and Excell aimed at the eventual full implementation of the entire Core Knowledge curriculum, although with different strategies for phasing in. Finally, Elim Preschool, with its few hours per week, could never expect to implement anywhere near all of the preschool curriculum that was

designed for preschools offered on a full-day, full-week schedule. In the Round 2 schools, TIES (another charter school) proposed to implement "several strands" of Core Knowledge, without specifying which ones would be targeted. Urban League Academy (a public alternative school), like the charter schools in the first round, proposed to implement the full Core Knowledge curriculum.

Figures 5 and 6 below summarize the implementation plans, year by year, for the participating schools, based on their original proposals and with modifications as reflected in their annual implementation reports.

5. Core Knowledge implementation plans for Round 2 schools

	Implementation plan for Year One (2003-04)	Implementation plan for Year Two (2004-05)
Urban League Academy	Start implementing Music, Art, Science, History, and Geography (no level specified in grant proposal)	Continue to implement Art, Science, History, and Geography (no level specified). Music implementation discontinued for the year. Preschool discontinued due to decreased district Hi-5 funding.
Twin Cities International Elementary School (TIES)	Continue implementation of several strands of Core Knowledge (unspecified in grant proposal)	Continue implementation of several strands of Core Knowledge (unspecified in grant proposal)

Sources: *Grant proposals and progress reports from the participating schools.*

6. Core Knowledge implementation plans for Round 1 schools

	Implementation plan for Year One (2002-03)	Implementation plan for Year Two (2003-04)	Implementation plan for Year Three (2004-05)
WISE	All teachers at each grade level will implement at least two Core Knowledge units in History and Geography, and Mathematics	Implement four Core Knowledge units in History and Geography, Mathematics, and two units of both Music and Literature	Implement six units in Social Studies, History, Geography, and Mathematics, and three units in Literature and Music. Begin implementing Science and Art (two units)
Excell	All grades implement the Language Arts, History, Geography, and Science components Begin to implement Art and Music content in grades K-4	All grades and specialist are teaching at a minimum of 90% of all subject areas.	All grades teaching all subject areas. Goal for extent of implementation modified from 100% to 80% due to teacher turnover.
Dowling	All grades implement some History and Geography content All grades will implement poetry component of Language Arts Begin to implement Art and Music content in grades K-2	Implement Art and Music strands in grade levels 3-5	All grade levels and specialists teaching at a minimum of 70% of the adopted subject areas (History and Geography, Art, Music, Poetry and unspecified other language arts, and Science).
Longfellow and Longfellow Hi-5	All grades implement Music, Poetry, Fiction/Drama, Sayings and Phrases along with any alignments that fall into place with the Minneapolis curriculum in Science, Math, and Language Arts (no distinction between implementation strategies for Elementary and Hi-5 levels)	Implement World History and Geography, and Physical Education strands	Implement American History, Science, Language Arts, and Math (with realignments or modifications); incorporate MIA Art Adventure
Elim	Room 5 implements selected sections of preschool sequence, mainly for Level 2 Room 4 and Tuesday/Thursday classes implement smaller sections of preschool sequence, Level 1 As a part-time, half-day school, implementation levels will always reflect this reduced schedule.	Room 5 implements more sections of preschool sequence Room 4 class implement larger sections of preschool sequence (Tuesday/Thursday class has been eliminated)	Room 5 implements up to 50% of Level 2 sequence. Dropped priority on holding two culminating events. Room 4 potentially up to 30-40% of Level 1 sequence. Dropped priority on holding one culminating event.

Sources: *Grant proposals and progress reports from the participating schools..*

Implementation levels for 2004-05: Curriculum taught

Information about the amount of the total Core Knowledge curriculum being used comes from several independent sources: teacher surveys in February and again in May, for Round 2 schools only, giving estimates for the total proportion of *instructional time* devoted to Core Knowledge in the past three months; curriculum checklists collected by the Humanities Commission at the end of the year indicating which specific units or topics were covered during the year; and interviews with principals in which they provided their perceptions of the degree to which their schools were meeting their implementation plans.

Figure 7 below compares checklist results from 2003-04 to those for 2004-05. Although the percentage figures should be interpreted as rough estimates only,[5] a few key patterns are evident:

- The level of implementation at the charter and alternative schools reflects the more ambitious plans expressed in their original proposals. By contrast, the public schools aimed for, and appear to be stabilizing at, somewhat less comprehensive levels of adoption, and in a more limited number of subject areas.

- Dowling, Longfellow, and WISE implemented a limited number of subject areas in the first year and then added more subject areas in later years. By contrast, Excell, TIES, and Urban League introduced at least part of all subject areas immediately. Both Excell and Urban League have scaled back in at least one subject area during 2004-05 in order to keep the effort manageable.

[5] The curriculum checklists provide the most comprehensive information on coverage of the curriculum, but the level of detail involved makes comparison across subject areas and grade levels difficult. Some topics listed separately as individual items in the checklists are major, multi-week units, while others are single songs or sayings. In designating a topic or cluster of topics as "one unit," it was not possible to have all "units" comparable in scale with each other. As a result, if two schools each taught 8 out a possible 10 "units" of language arts, but one school omitted two small units while the other school omitted two large ones, both might be said to have taught 80 percent of the content, but in neither case would the 80 percent figure be more than approximate. However, because we have used the same way of grouping topics into "units" each year, comparisons from year to year are helpful as an indication of change in the amount of the Core Knowledge curriculum being taught.

7. Proportion of possible Core Knowledge units implemented in 2004-2005, compared to 2003-2004

	World History		American History		Language Arts		Science		Visual Arts		Music	
	03-04	04-05	03-04	04-05	03-04	04-05	03-04	04-05	03-04	04-05	03-04	04-05
Dowling	76%	64%	79%	68%	10%	32%	8%	15%		*		*
Longfellow	63%	73%	0%	79%	63%	77%	19%	59%	0%	81%	63%	73%
WISE	81%	100%	93%	89%	26%	95%	82%	100%	16%	0%	2%	83%
Excell	86%	99%	100%	98%	86%	89%	95%	97%	91%	47%	93%	50%
TIES	79%	68%	91%	93%	61%	67%	88%	81%	37%	32%	4%	14%
Urban League	79%	76%	94%	64%	77%	74%	88%	78%	73%	55%	84%	11%

Source: *Curriculum checklists completed by teachers in February 2004 and May 2005 and submitted to the Humanities Commission.*

Note: *Preschool teachers were not asked to complete curriculum checklists. *Checklists from Music and Art specialists not available from Dowling.*

In interpreting the figures shown, besides recognizing the fact that the percent of total units may not be the same as percent of total content (since "units" may be of any size), it is also important to recognize that the national Core Knowledge Foundation considers "full implementation," using 100 percent of the Core Knowledge curriculum, to likely occupy only 50 percent of a school's total instructional time. Therefore, the figures reflected in the table above are reasonably consistent with survey results from teachers in Round 2 schools, in which teachers most commonly estimated that they devoted around 20 to 30 percent of classroom time to Core Knowledge content.

There is a wide variation from teacher to teacher in the percent of classroom time that they report was devoted to Core Knowledge. This variation appears to be greater than the variation in the percent of units taught. This difference likely has two causes: One may be due to error in estimation, since there is no precise way for teachers to quantify classroom time. The second may be due to different depth of coverage, or differences in the efficiency with which different teachers are able to cover the same amount and depth of content. From principal interviews and teacher survey results, we conclude that teachers who are presenting the same topic for the second or third year are able to do so not only with greater confidence, but also with more depth and effectiveness. Thus a nominal level of coverage of 65 or 70 percent of units in the second or third year may represent more full implementation (in terms of effective student learning) than a nominal level of coverage of 80 percent of units in an earlier year.

With these uncertainties in mind, we conclude (based on the different sources of information in the schools as well as interviews with Humanities Commission staff) that most schools are at the level of implementation they expected by the end of the 2004-05 school year, with some reservations in the case of Excell and Urban League Academy given the challenges they have encountered in some kinds of structural support at the overall school level (such as common planning time, effective curriculum mapping, and access to resource materials). These are discussed below.

Factors affecting implementation

Staff factors

As the logic model illustrates, full implementation of Core Knowledge is presumed to require, among other factors, that teachers have a minimum level of understanding of the goals of the curriculum and its scope and sequence, knowledge of the content matter that they are responsible for teaching, and familiarity with appropriate options for assessing students' progress in mastering that content. Teachers without prior training in Core Knowledge may require a considerable amount of time and effort to acquire this new understanding and knowledge, which can involve a significant professional shift of gears. Successful implementation thus also depends on teachers' being committed enough to the curriculum to be willing to invest their time and energy in making this transition.

Based on reports from the Humanities Commission staff and each school's principal, all of these factors appear to be at least somewhat positive for all but one of the Round 1 schools as they closed out their third year of implementation. In addition, in all of the schools, they appear to be strengthened compared to the end of the second year.

Teachers' commitment to the program is particularly noteworthy for these schools for several reasons. When principals were interviewed in the spring, they were asked what they considered to be some of the factors that have helped their school achieve their current level of implementation. All five of the Round 1 principals mentioned teachers' commitment to the program (or "buy-in" as some termed it) as an important element. Although some Excell staff have appeared uninterested in some of the Humanities Commission's trainings this year, the administrator of the school was strongly of the opinion that the staff are committed to the curriculum itself. At Dowling, the principal reported that "The staff really, genuinely enjoy teaching it … The teachers are personally invested. … [they] want to do it, think it's fun, interesting and motivating. … Implementation has become teacher-led."

At Round 2 schools, based on principals' and Humanities Commission staff's reports plus surveys of the teachers in February, teachers are not as far along in these factors. In particular, assessment is an area in which teachers continue to feel themselves to be less than fully prepared in the second year. However, as with the Round 1 schools, in both schools there is evidence of progress compared to a year earlier. Also, staff at both schools appear to be reasonably committed to the Core Knowledge curriculum, which suggests that there is reason to expect that they will continue to gain knowledge and skills in the other areas in the coming year. At TIES, in previous years teachers have "looped," or continued to work with the same students at the next grade level in order to build on their knowledge of individual students' learning needs and styles. However, in 2004-05, TIES made a strategic decision to forego this practice specifically to strengthen teachers' mastery of the grade-level Core Knowledge content and the instructional techniques relating to that content.

Staff factors are summarized below in Figure 8. The next section, on resource and structure factors, gives some perspective on some of the reasons for differences among schools in some of these factors. Staff turnover, discussed above, may be another reason for some of these differences.

8. Staff factors relating to Core Knowledge implementation

	Familiarity with goals and scope and sequence	Familiarity with content to be taught	Familiarity with assessment options	Attitude and commitment to Core Knowledge
Dowling	Positive	Somewhat positive	Positive	Positive
Longfellow	Positive	Somewhat positive	Positive	Positive
WISE	Positive	Somewhat positive	Positive	Positive
Excell	Somewhat negative	(Not enough information to rate)	Somewhat positive	Somewhat positive
Elim	Somewhat positive	Somewhat positive	Somewhat positive	Somewhat positive
TIES	Somewhat positive	Somewhat positive	Somewhat negative*	Somewhat positive
Urban League	Somewhat negative	(Not enough information to rate)	Somewhat negative*	Somewhat positive

* *Based on teachers' survey responses, February 2005.*

Sources: *Interviews with principals and directors (winter and spring 2005), interviews with Humanities Commission staff (spring 2005), surveys of teachers (February 2005).*

Resource and structure factors

The teacher factors highlighted above depend not only on professional development (to raise teachers' levels of knowledge and skill at the individual level) but also on the availability of resources and structures to support the effective use of that knowledge and skill. School-level structures that are highlighted in the logic model as particularly important, based on the Johns Hopkins research, are the regular availability of common planning time (and other opportunities for teachers to partner with each other), and the completion of a thorough process of curriculum alignment, in which the new curriculum is compared to previous curriculum and to applicable district and state standards. Ideally, this alignment is done on a regular basis, and also includes work to compare and integrate the curricula for different grade levels and disciplines.

Based on a variety of data sources, the Round 1 schools appear to have made progress in all of these factors during the 2004-05 year, and in particular to have attained significant on-going strengths in common planning and teacher teaming (with the recognition that in smaller schools with only one teacher per grade level there is limited opportunity for teaming). All schools but one have resource collections in place to support the delivery of the Core Knowledge material and have made strides in cataloging these resources and making them readily accessible to teachers. All schools but one have accomplished the needed work of aligning the curriculum to standards. Most have also accomplished significant work to integrate the curriculum across grade levels and disciplines, including those such as music, art, and physical education that may involve the work of specialist teachers. Excell has made least progress in curriculum alignment and integration, and that only under the direct supervision of Humanities Commission staff, but the administrator there reported in his interview at the end of the year that as a result of the Humanities Commission's work with the teachers, they were beginning to realize "how they can tie everything together [and] see others' activities."

One theme that was reiterated across many of the schools was the importance of teachers' professional sharing with each other. This includes not only common planning time but also joint problem-sharing and brainstorming as well as mentoring. The regular availability of these opportunities is felt to help promote the conditions for real professional growth and commitment to the curriculum. At Longfellow, the principal highlighted the sharing of information and methods among teachers as one of the factors most responsible for their successful implementation of the curriculum. Teachers, and their principals or directors, are interested in time to share ideas and insights not only with grade-level peers within the school, but also with teachers at other Core Knowledge schools, and especially those who are further along in implementation.

Round 2 schools have also shown significant progress compared to last year in the acquisition of resources and their availability to teachers, and in common planning and teacher teamwork. One of these schools has done the initial work on curriculum alignment and revisits that on an annual basis. We were unable to document the degree of curriculum alignment for the other school, or the degree of inter-grade and interdisciplinary integration in either Round 2 school.

Figure 9 below summarizes 2004-05 implementation of resource and structure factors.

9. Resource and structure factors relating to Core Knowledge implementation

	Adequacy and availability of resources	Common planning time and teacher teaming	Curriculum alignment	Curriculum integration
Dowling	Positive	Positive	Positive	Positive
Longfellow	Positive	Positive	Positive	Positive (esp. in primary grades)
WISE	Positive	Positive	Positive	Positive
Excell	Mixed	Somewhat positive	Somewhat negative	Somewhat negative
Elim	Positive	Positive	NA	Positive
TIES	Positive	Positive	Positive	(Not enough information to rate)
Urban League	Somewhat positive	Positive	(Not enough information to rate)	(Not enough information to rate)

Sources: *Interviews with principals and directors (winter and spring 2005), interviews with Humanities Commission staff (spring 2005), surveys of teachers (February 2005).*

School leadership

In last year's report, we commented that the logic model drafted at the outset of the initiative envisioned "principal's support and leadership for planning and instruction" as a short-term outcome of the efforts of the project, and suggested that the principal's leadership was an important factor in the quality of implementation at an earlier point. The evidence from the 2004-05 year of implementation supports and reinforces this hypothesis. We continue to see evidence of the many ways in which the principal's leadership affects resource availability, scheduling, and planning. Through these factors that shape the conditions of teachers' work, the principal's leadership (whether direct or delegated) also influences teachers' skills and commitment.

Principals with highly effective leadership related to Core Knowledge have contributed to the success of Core Knowledge implementation through their efforts to establish both

high expectations (including clear communication of roles and accountability) and high support (including adequate and accessible teaching resources, schedules that include needed time for common planning, and opportunities for reflection and adjustment). In some schools, the direct work of monitoring implementation has been done by the principal, while in others it has been delegated to an administrative aide or to leaders among the staff. These differences have been unimportant compared to the overall effectiveness of the principal who takes the responsibility to ensure that the vision is clear, and that there are plans for accomplishing it and processes for assessing and adjusting how it is accomplished.

Parent and community awareness and involvement

All of the Round 1 schools report numerous Core Knowledge-related events to showcase students' work for parents. The extent of these is somewhat uncertain for Elim Preschool, where on the one hand the principal reported that they had held no culminating events for parents, because these were seen as "relatively low priority," but elsewhere in the interview described an "Olympic Day" where children displayed a variety of Core Knowledge movement skills and accomplishments, such as maintaining balance on a balance beam and coordinating movements with a partner. Elim also planned to use the graduation ceremony as another event to showcase Core Knowledge attainment in the areas of songs and fingerplays, nursery rhymes, and care and observation of growing plants.

In general, schools appear to have made little effort to educate parents about the name "Core Knowledge" as a specific curriculum package, but on the other hand have made substantial efforts to educate parents about what content their children are learning. A typical comment was from the Elim principal, who reported that "Most parents wouldn't know the name 'Core Knowledge,' but they're fairly aware of what content is being covered." Most report generally favorable reception from parents. The WISE principal reports that "parents are always blown away by the content" their children are learning, when they see it displayed at the culminating events the school holds.

The work of the Round 2 schools with parents appears to be relatively consistent with the second year of work for the first round of grantees. There is less evidence of culminating events, and less information being provided to parents. Like the Round 1 schools, TIES reports an emphasis on informing parents about the content their children are learning rather than the name of the curriculum. The Urban League Academy reports a frequently-heard difficulty in reaching low-income and highly mobile parents: "It's a challenge to get parents involved with Core Knowledge. The parents are stretched too thin to have much interest in which curriculum the school is using." However, they are working on coordinating their monthly assemblies (where there is always a Core Knowledge piece) with their quarterly meetings with parents. Since their parents have expressed an interest in

having Black History taught in the school, the work that they are beginning with the Humanities Commission to incorporate this into the Core Knowledge units will likely help them to link the term "Core Knowledge" to the specific curriculum focus that is already of interest to their parents.

Figure 10 below summarizes the above two sections on leadership and parent knowledge and awareness of Core Knowledge for the 2004-05 year.

10. School leadership and parent awareness of Core Knowledge

	School leadership	Parent awareness and involvement
Dowling	Positive	Positive
Longfellow	Positive	Positive
WISE	Positive	Positive
Excell	Somewhat negative	Positive
Elim	Positive	Somewhat positive
TIES	Positive	(Not enough information to rate)
Urban League	Somewhat negative but improving	Somewhat positive

Sources: *Interviews with principals and directors (winter and spring 2005), interviews with Humanities Commission staff (spring 2005), surveys of teachers (February 2005).*

Other factors related to implementation level

The findings presented above summarize factors reflected in the logic model for the Cargill Core Knowledge Connection, based on prior national research of features of schools' implementation experiences that had been found to be associated with high fidelity of implementation. Over the three years of the initiative here in the Minneapolis area, we have observed a number of additional factors that appear to be related to implementation.

One of the most important of these is the availability of resources, already mentioned above in connection with instructional issues. This factor is a constant theme in teacher surveys and principal interviews, and features again this year in the interviews in connection with schools' readiness to sustain Core Knowledge at the end of the initiative. Schools are in consensus that the grant funding was essential in helping their schools acquire the resources needed to implement the curriculum. For some schools with fewer other sources of support, the grant-funded resources may not have been enough. It is also possible that the grant resources were not targeted as efficiently as they might have been in these schools.

Other factors that affect implementation include the training and other technical support provided by the Minnesota Humanities Commission; district and community-based challenges including imperatives driven by the No Child Left Behind (NCLB) testing requirements; student mobility; staff mobility; and budget and funding decreases. In addition, schools face other challenges related to the adaptation of the Core Knowledge curriculum to their specific student populations, particularly in the areas of making the content matter accessible and relevant to students with low reading levels or limited English fluency, or to those from non-Anglo backgrounds whose cultures and histories are less often represented in American "core" topics and themes.

Training

Training continues to be a sensitive topic for some schools. After initial dissatisfaction from some schools (especially the Minneapolis Public Schools) with the training offered, especially in the first year of the initiative, this year the Round 1 schools expressed a high level of satisfaction with the on-going training and professional development. The two public school principals reported that "MHC has modified what they've done to accommodate teachers' requests quite well," and that "MHC really got a hold of the issue of training last year, and [the school] is very pleased." At one of the Round 1 charter schools, the Humanities Commission's work during professional development sessions has been crucial to accomplishing the work needed for curriculum mapping and alignment. At the other Round 1 charter school, the principal identified the grant's budget for professional development as one of the factors most responsible for promoting successful implementation.

As documented in the Humanities Commission's periodic reports to the Cargill Foundation, training has been an issue of serious disagreement with TIES during 2004-05. According to the principal, the problem is not the school's lack of interest in staff development. Rather, the principal assured Wilder staff during the mid-year interview that the school believes staff development is essential, but that they "don't have much time for staff development, so those opportunities are put at a premium" and must be very carefully focused on highest priority needs. Based on information from the school and the Humanities Commission, research staff conclude that the tension is primarily related to differences in the two organizations' perceptions of the priority that the school should give to specific Core Knowledge content issues, compared to other training needs of a relatively young and inexperienced staff. A second source of tension is related to the high emphasis given by Humanities Commission staff to the use of art and artifacts in instruction, and to the two organizations' very different perceptions of the role and meaning of artwork within the Muslim faith in general, and more importantly in the Somali culture predominant among the families served by the school.

Teachers' comments (provided in the February survey) supplement the views of the principal at this school. Relatively few teachers reported training sessions led by the Humanities Commission were "not very useful" (18%, about the same average proportion as reported by Round 1 schools the previous year). However, none reported that they were "very useful," compared to 32 percent on average among Round 1 schools, and 83 percent for the other Round 2 school.

It appears that the tension between the principal and Humanities Commission staff over the group trainings has also impeded more individualized support for staff at this school. Teachers report lower use of individualized supports from Humanities Commission staff. Only one-quarter reported having any direct contact outside of training sessions (24%, compared to 61% in Round 1 schools and 50% in the other Round 2 school). However, the small number of teachers who did receive such individualized help were generally very satisfied with it: 75 percent rated it "outstanding" or "good," about the same proportion as in Round 1 schools.

The Humanities Commission's Teacher Institutes (intensive workshops on content knowledge for teachers) and the Somali Culture conference that the Commission co-sponsored were mentioned by a few principals, teachers, or both as helpful resources for school staff. Summer unit-writing workshops for Round 2 schools appear to have been welcomed.

One wish expressed by two different principals is for training to be scheduled sooner. In one case, this means to have it earlier in the year, so that teachers have more time to apply what is learned. In the other case, it means to announce the schedule sooner (during the summer), so schools have more time to make plans around it.

Other technical support

Besides the training opportunities, other supports offered by the Humanities Commission included Roundtables in January to connect teachers with grade-level peers from other schools in the Cargill Core Knowledge Connection, a limited amount of opportunity to connect with other Core Knowledge schools outside of the initiative, and a variety of supports individualized to a school or teacher.

Roundtables. "The roundtables were fabulous," according to the principals. "The teachers loved them," especially those from the charter schools which, as smaller institutions, are less likely to have grade-level peers for teachers. They were labor-intensive for the Humanities Commission to plan and administer, but were warmly welcomed. Suggestions for future roundtables include holding one for administrators, and spreading them out over more than one week (to make it easier for schools to arrange

for coverage by substitutes). Different schools have differing ideas about whether they should be scheduled during regular school hours or outside of the usual work day.

Connections with other Core Knowledge schools. There is some hunger among initiative participants for connections to other Core Knowledge schools, and especially to those that have greater experience with implementation. In the survey of Round 2 teachers, three-quarters expressed a desire for more contact with other teachers teaching Core Knowledge at their grade level or specialty area in another school. (This compares to half of Round 1 teachers when the same question was asked of them in the previous year.) Three principals requested help to arrange such contacts.

National Conference. Schools continue to find limited value in attending the national Core Knowledge conference. Only half of the participating principals mentioned it during their interviews, and two did so only to explain why they did not find it worth the cost to send staff members to attend it. In general, given limited resources, schools prefer to invest their available funds in less costly activities that a higher proportion of staff can benefit from.

Individualized support. Individualized help provided by the Humanities Commission during the year included connecting some Dowling staff with resources in the University of Minnesota Department of Geography, helping teachers at several schools find and use resource materials for specific units, helping WISE obtain specialized support to develop plans for integrating Black History with the Core Knowledge material, and providing structure and accountability for planning and curriculum mapping at Excell. The principals at Round 1 schools all expressed appreciation for the Humanities Commission staff's support during 2004-05. One cited "the consistent support from MHC" as one of the best features of the grant; another reported that they "were lucky to be able to work with a support organization like MHC, because it helped bridge between the funder, the school, and the other grantees. Training and connecting [were valuable]." In terms of the balance of support and directiveness, a third principal reported that the Commission has been "available but not overbearing – just right."

This picture presents a stark contrast with the view of one Round 2 school whose principal reports that they "can tell that MHC wants to help, but it's been hard for [the school] to get across that they don't want MHC's help." This principal perceives, based on some telephone conversations with other principals, that this is a widely shared perspective among schools in the Cargill Core Knowledge Connection. However, the results of Wilder's interviews with principals do not support this view. There was partial agreement from one Round 1 principal, who reported that the funding was the most valuable part of the initiative, but this principal also reported that the Humanities Commission's availability and support was appropriate to their needs.

As the different principals' comments illustrate, there is some difference of opinion on the relative importance and value of the Humanities Commission's technical support, compared to the cash grants provided by the initiative. The work of the Humanities Commission staff has shown an evolving sense of how to achieve the delicate balance between supportiveness and directiveness. This has been greatly facilitated this year by the greater degree of stability in project staffing at the Commission, and the staff's consequent ability to develop and build on good relationships with the schools.

Main challenges reported by schools

In the schools participating in the Cargill Core Knowledge Connection, implementation of the curriculum has been affected by a number of school, district, and community characteristics, as well as by factors more directly related to the Core Knowledge curriculum itself. School, district, and community factors – which are interrelated – hinge mainly on student and staff mobility, shortage of funding, and testing and achievement requirements under the No Child Left Behind (NCLB) law. Factors relating more directly to the curriculum include the classroom time needed to cover the content; the staff time needed for professional development, common planning, and finding appropriate instructional resources; and the challenges of adapting content and resources for minority and immigrant students' backgrounds, as well as special learning needs of children with limited reading ability or limited English fluency.

School, district, and community factors

Student mobility. Turnover among students is a significant issue for nearly every school in the initiative. On average across the elementary schools, 22 percent of children in the schools in September are new to the school and have no prior exposure to Core Knowledge. By February, in an average classroom, 10 percent of the children have come into the classroom just since September – and similarly have no prior Core Knowledge experience. As a result, by half-way into a year, as many as 30 percent of children in an average classroom are likely to be lacking at least some of the prior knowledge that the curriculum is designed to build upon. While some of the infusion of new students can be attributed to grade or school expansion (most notably at TIES) or reconfigured attendance areas (Longfellow), much of it simply reflects the realities of residential mobility among young families in a large urban center, especially among poor and minority families that are the main clientele for the charter and alternative schools in the initiative.

Students' prior experience with Core Knowledge is an important consideration for successful implementation, since the curriculum is based on the expectation that all students will share a common foundation of knowledge, gained in prior years, which can be built upon in subsequent years. The idea behind this theory is supported by teachers'

responses to the mid-year survey, in which a majority of teachers (56%) reported that "students with prior Core Knowledge experience have a higher level of factual knowledge." In addition, a substantial minority of teachers (39%, including 52% of the public school teachers) agree with the statement that "students with prior Core Knowledge experience are better able to connect facts to their own lives." A teacher with a sizable group of students who lack experience with Core Knowledge cannot move forward immediately in the fall with the expectation that all students share a common grounding in a shared knowledge base. As a result, contrary to the curriculum's philosophy, some instructional time must be devoted to review of already-introduced concepts and skills.

Staff mobility. Mobility among staff also affects Core Knowledge implementation. District budget cuts and layoffs have resulted in the re-assignment of many teachers at the two public elementary schools, and in one principal being given the responsibility for leadership at a second school that is not part of the initiative. The charter and alternative schools have varying degrees of staff turnover, related both to the overall fiscal and administrative stability of the school and also to the school's expansion in grade levels and/or number of sections per grade. Half of the schools in the initiative report that they ask applicants for teaching positions about their familiarity with Core Knowledge, and require a commitment to learn and use it as a condition for employment.

NCLB testing requirements. Another significant factor in the implementation of Core Knowledge during 2004-05 was the emphasis on basic reading and math skills and the mandatory testing of those skills required by the No Child Left Behind (NCLB) Act. These testing requirements were of particular concern in the public and alternative schools that are part of the Minneapolis Public School district. Although children in the three charter schools must also take the tests, the teachers and principals in those schools reported less anxiety relating to the testing, and less strain on the curriculum. By contrast, the public and alternative schools report greater proportions of instructional time and effort devoted to reading and math instruction, making it more difficult to incorporate the many different components of the Core Knowledge curriculum. A secondary consequence of the intense focus on basic skills is a decrease in the availability of professional development time for Core Knowledge. Although the state has now adopted new standards for Social Studies that are reasonably consistent with the Core Knowledge curriculum, the district has not yet developed guidelines or supports for schools to implement these standards. As a result, the schools' efforts to support Core Knowledge have been strained by the combination of limited time and resources and increasing demand on those resources for other purposes.

Factors related to the design of Core Knowledge

Time. As noted in reports on earlier years of implementation, schools cite a number of challenges related to the amount of time required to fully implement Core Knowledge. This includes at least three kinds of time challenges:

- Because of the amount of content to be covered, the curriculum requires a substantial amount of instructional time to fit it all into the school day and year. This challenge was mentioned by both of the Round 2 schools, and two of the four Round 1 elementary schools. (It has always been understood that Elim, as a part-time nursery school, would be unable to incorporate the entire curriculum that was designed for full-time preschool programs.)

- Because of the new content knowledge and instructional strategies required of teachers, a one-time investment in professional development is required to help professional staff make the conversion to Core Knowledge. This challenge was mentioned more by Round 2 schools than by the Round 1 schools, where more of the initial training has now been accomplished.

- Because of the importance of common planning and preparation, on-going staff time is needed for teachers to jointly plan at a range of levels, from individual lessons and units to full-year content maps to multi-year content sequences. This was cited as a continuing challenge for one of the Round 1 schools, but other schools appear to have worked out the needed adjustments in their schedules.

In past years, reflecting the importance of experience for gaining skill and comfort in the implementation of Core Knowledge, principals and teachers have cited the need for time, over a period of years, to work out all the things they need to know and do to make the curriculum successful. This need was reflected in the design of the Cargill Core Knowledge Connection as a multi-year initiative. The gain in skill and comfort is reflected in the fewer mentions this year of this particular kind of time challenge. As mentioned already, all but one of the Round 1 schools has now reached a point of implementation that reflects a considerable degree of institutionalization of the curriculum.

Adaptations. An additional set of challenges is posed by the perceived need to adapt the curriculum. There are three populations of students for whom principals and teachers find that adjustments are needed to make the basic curriculum, and the most readily available instructional materials, a better pedagogical fit. First, some schools, in both Round 1 and Round 2, continue to mention the scarcity of instructional materials at reading levels that are accessible for their children, and the on-going need to adapt available materials to meet this challenge. Second, this need is greater for children who are not native speakers of English, posing additional challenges especially at TIES.

Finally, several of the more specifically culture-centered schools (WISE, Excell, and TIES) report that for their families it is important to incorporate more material relevant to African Americans (WISE and Excell) or to African immigrants (TIES, where the issue is also to reduce the amount of material that is likely to be offensive to Muslim beliefs and practices).[6]

In response to the need to find pedagogical approaches for students with limited reading facility, principals who mentioned the challenge generally also indicated that they have requested and received help from the Humanities Commission. TIES indicated mainly that they were looking for recognition that the language-learner issue and the need to be responsive to religious differences are unique challenges for them. They also indicated that they seek the freedom from oversight to meet these challenges in their own ways. The Humanities Commission has been working with WISE and Excell to help them find resources to incorporate additional material to better reflect the African American experiences of their student populations. The flexibility to make such adjustments around the edges of the standard core curriculum is clearly an important selling point for most of the schools in the initiative.

Cost of materials. A third recurring theme in describing implementation challenges is the expense, especially for instructional materials. For most schools, the grant appears to have been the determining factor that made the adoption of the curriculum possible at all. Most Round 1 schools evidently consider that there is some on-going expense for this purpose beyond the period of the grant, but at a reduced level that they feel able to cover. However, the continued necessity of adapting materials for the special needs just mentioned adds to the initial conversion cost and to the on-going maintenance costs.

[6] Cultural appropriateness for American Indian children is also a concern for at least one school. That school has found ways to address this issue, which has not been as great a need in the other schools.

Discussion and issues to consider

The statistically significant gains in mathematics achievement for students in the two Core Knowledge schools in the initiative are a welcome indication of successful implementation in the two schools for which such test results can be readily analyzed. The assessment of implementation indicators suggests that at least one other Round 1 school in the Cargill Core Knowledge Connection has likely reached a similar level of implementation by the end of its third year.

Among the Round 1 schools that are now in the final months of their grant period, all but one appear to have incorporated Core Knowledge into the institutional fabric of the school in such a way as to make the curriculum likely to be sustained. This includes both of the public schools (and the associated Hi-5 preschool), the private preschool, and one of the two charter schools. The experiences of these schools, and the contrasting experience of the remaining Round 1 school that is less fully implemented, tend to bear out the hypotheses built into the logic model about the factors that are important to success. In particular, all the higher-implementing schools exhibited, at least by their second year, the following key features:

- School leadership that was both committed to the curriculum and effective in promoting it with the staff and monitoring staff implementation.
- Effective processes in place in the school to ensure that adequate and appropriate new resources were acquired and made available to the teachers.
- Effective processes in place in the school to ensure that teachers had time to plan jointly with others, at multiple levels: among grade level peers (where available) for individual classroom lessons, with other teachers who also taught the same children in the same year (such as music or physical education specialists), and with teachers in other grades whose content preceded or followed their own in the overall, multi-year sequence.

The experiences at the higher-implementing schools also suggest one additional tentative conclusion about successful implementation:

- It appears to be important to introduce the new curriculum gradually, a few subject areas per year, instead of all at once in the first year.

Teaching the Core Knowledge curriculum in its entirely requires a considerable amount of new learning on the part of teachers (and others in the school), and considerable extra effort for several years until new methods are mastered. This new knowledge and

practices include, in part: understanding a new philosophy; learning not only the scope and sequence of curriculum for their own grade levels but also understanding how that fits within the overall multi-grade, multi-year scope and sequence; mastering (or at least becoming familiar with) a body of new content knowledge; re-writing a large number of new lesson and unit plans; collaborating closely with colleagues, which many teachers have little experience doing; identifying and acquiring (and sometimes adapting) resource materials to use in the new lessons; and learning and practicing new assessment strategies.

The gradual introduction of Core Knowledge was a deliberately-chosen feature in the implementation plans of all the higher-implementing schools in Round 1. In interviews at the end of their third year of implementation, many of these principals cited that strategy as a factor in their school's success with the implementation. From these interviews as well as the other sources of information, the evidence points to a variety of inter-related ways in which a slower start helped promote successful implementation.

First, most of the Round 1 schools had a full year prior to implementation during which the Humanities Commission helped the principals and staff acquire some familiarity with the Core Knowledge rationale and philosophy, giving them a start on the gradual transition to its adoption.

Second, the introduction of just a few strands of curriculum initially allowed teachers a manageable scale on which to start learning the new scope and sequence and content knowledge, and to be responsible for a limited number of new lessons and units. This helped them to gain confidence and experience success with Core Knowledge.

Third, this confidence and success, in turn, helped sustain the energy and enthusiasm of staff to continue to move into additional new strands in the second and third years. As one teacher commented in the second-year survey, "Core Knowledge is extremely hard to plan and teach for the first year. This was my second year, and it's easier now." In the year-end interviews, principals emphasized the importance of teachers' attitudes and commitment, and of giving teachers time to become comfortable with the curriculum and invested in it.

An additional lesson learned also relates to teachers' comfort with and attitudes toward Core Knowledge:

- It is valuable to help principals and teachers learn the new curriculum, and the new ways of teaching that it requires, by providing opportunities for personal observation and mentoring with peers in other schools who have greater experience using Core Knowledge.

In surveys and interviews, principals and teachers placed great value on such personal exposure to Core Knowledge in action, and to personal contact with peers experienced in using it. "Allow the teachers to have contact with people who are excited about it, and to actually see them teach it," one principal advised. Other principals also recommended that teachers have opportunities to be mentored by more experienced Core Knowledge teachers, and teachers in their survey responses indicated a high level of interest in having contact with peers at other Core Knowledge schools. Given the emphasis on children's use of tangible, hands-on materials in their Core Knowledge units, it is natural that the professionals leading these units would similarly benefit from concrete, hands-on experiences for their own professional learning.

The Minnesota Humanities Commission has invested significant resources and effort in their support for Cargill Core Knowledge Connection schools over the past four years, including the developmental year before Round 1 grants were awarded. They have directly provided or arranged for a wide variety of different kinds of training, in addition to other kinds of support. Throughout all the different sources of information collected for this evaluation, one key theme has consistently emerged relating to effective support for the schools in the initiative:

- The most helpful training, or other kind of support, is highly individualized to the specific mix of circumstances in a given school at a given time.

Some teachers, especially in the public schools, began the initiative with extensive professional experience and a full year of introductory information about Core Knowledge. They were unhappy with an orientation training that repeated information they already knew about the basic Core Knowledge philosophy, or training that did not recognize their existing skills with unit writing in general; they were more interested in training focused more specifically on the new content knowledge and materials directly related to that content, and other kinds of support to get them started on the common planning that they needed to engage in. However, at other schools with relatively young and inexperienced staff, where the teachers had been less involved in the process of preparing for the grant, the more general orientation and more basic professional curriculum and instruction skills were felt to be more valuable than narrower, content-specific information.

Humanities Commission staff have worked very hard to individualize their support, and especially the professional development opportunities, to be responsive to specific schools' interests and needs in this way. With the exception of one Round 2 school, this effort has been successful and appreciated by the participating schools. There is some irony in the importance of this theme, given the grounding of Core Knowledge in the philosophy that the most powerful and effective curriculum is one that is the same for all.

However, at a deeper level, it may be seen as replicating other lessons learned about Core Knowledge implementation, which have included the persistent theme, across schools, that the specific materials and strategies used to teach the common curriculum required considerable effort to tailor to the cultural backgrounds, languages, and reading levels of the students.

In addition, the differences implied in this theme based on teachers' different levels of experience and skill mirror the difficulties Core Knowledge teachers have experienced working with classrooms that include a relatively high proportion of students who were not at the school in the previous year and who therefore lack the prior knowledge base presumed by the curriculum, no matter how effectively the school itself has implemented the program. Solutions to the issues of high student mobility lie beyond the scope of the Cargill Core Knowledge Connection. However, test scores from Dowling and Longfellow schools suggest that this mobility does not negate the effectiveness of the curriculum when even selected strands of it are highly implemented.

Appendix

Logic models

A. Elementary

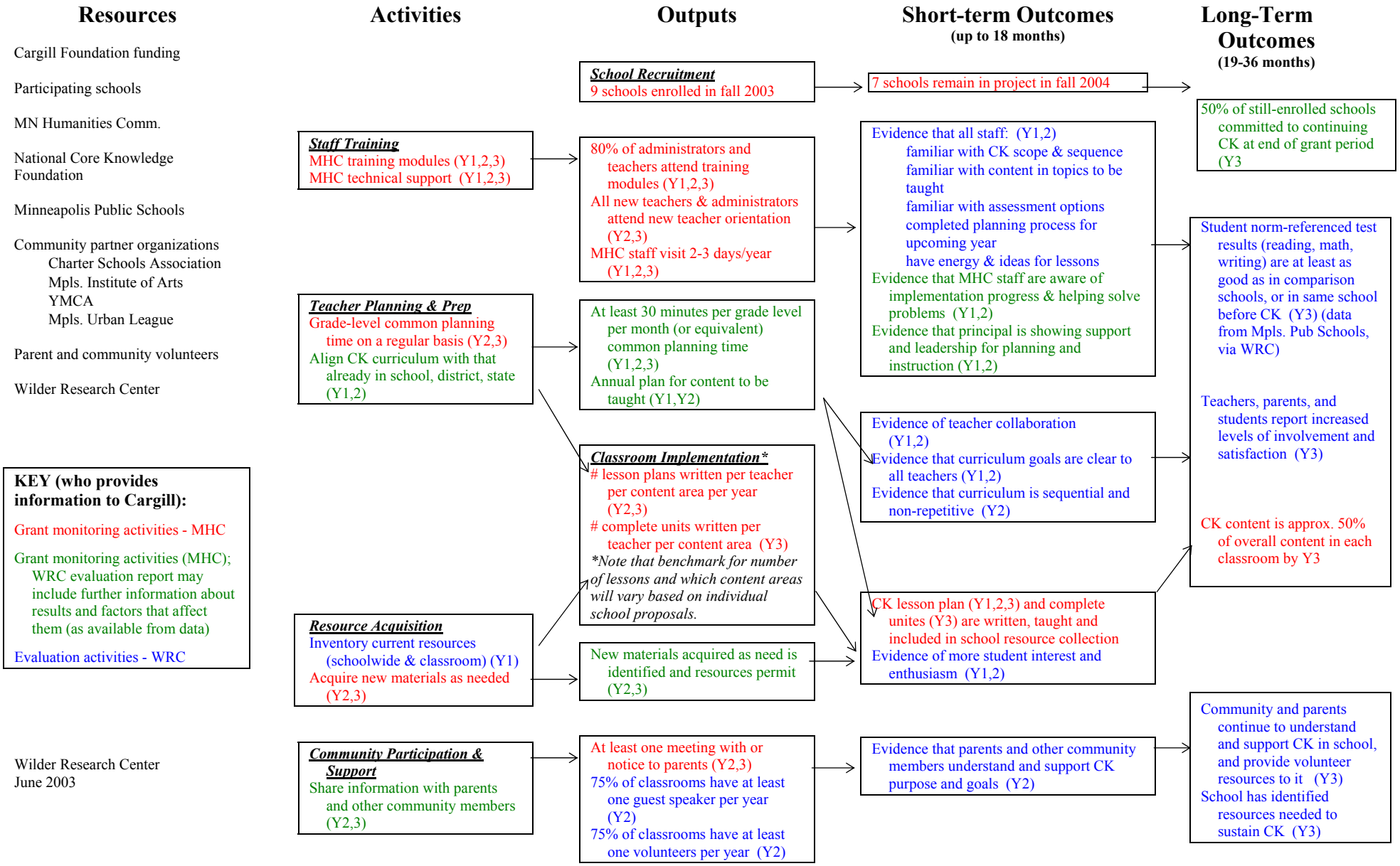
B. Preschool

Analysis of Core Knowledge student test scores

(Report from the Minneapolis Public Schools Office of Research, Evaluation and Assessment)

Cargill Core Knowledge Connection – Logic Model (Elementary)

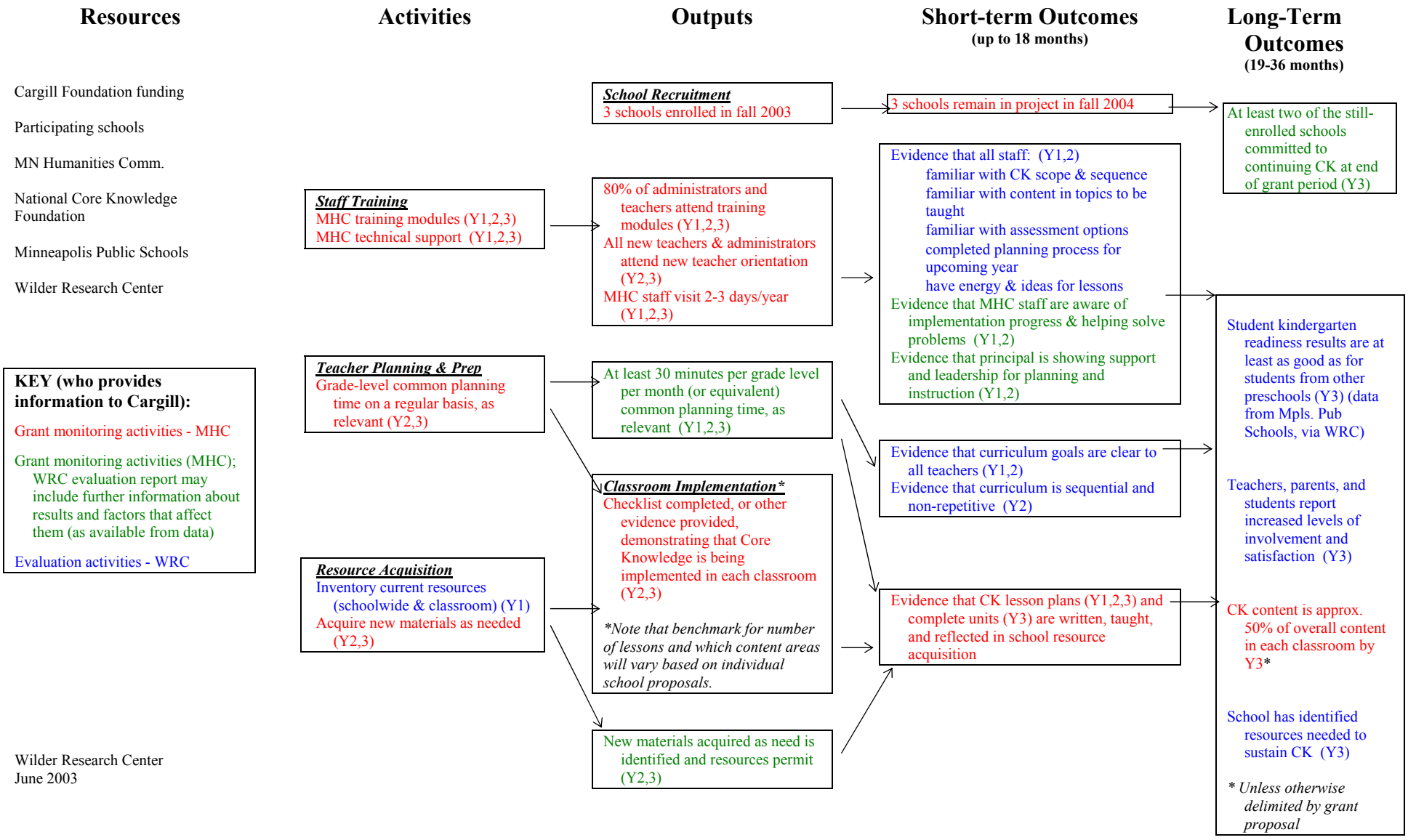
Overall program goal: To strengthen and improve academic achievement for students in participating schools.



Wilder Research Center
June 2003

Cargill Core Knowledge Connection – Logic Model (Preschool)

Overall program goal: To strengthen and improve academic achievement for students in participating schools.



Wilder Research Center
June 2003

Analysis of Core Knowledge student test scores

2004-05 Core Knowledge Analysis
Minneapolis Public Schools, Office of Research, Evaluation and Assessment

This report provides summary results for Minneapolis Public Schools (MPLS.) participants in the second year of the Core Knowledge program. One of the main objectives of the program is to improve academic achievement in reading and math among preschool (pre-K) and K-5 students. MPLS. assesses these skills for grades 2-5 in the spring using the Northwest Achievement Levels Test (NALT). First grade students are assessed for reading skills using the Oral Reading Assessment (ORA) and literacy skills in pre-kindergarten and kindergarten students are assessed using two domains of the Kindergarten Assessment; phonemic awareness and alphabetic principles. Accordingly, this report focuses on NALT reading and math scale score growth rates for students in grades 2-5, reading rate benchmarks on the ORA for first grade, and levels of the KA for pre-k and kindergarten participants.

Methodology

Data

All students attending Dowling Urban Environment Elementary and Longfellow Community Elementary during the 2004-05 school year were considered participants in the Core Knowledge program. Analyses were based on the performance of these students in standardized assessments in reading and math. Performance was compared among participants between years 2004 and 2005 and to a matched sample of student in the districts who did not participate in 2004 or 2005. Table 1 provides a summary of the program participants at the two sites along with the relevant assessments.

Core Knowledge participants were separated into two files; those who were continuously enrolled at the participating schools for the entire academic year and those who attended participating sites but did not receive full exposure to the program. In order to be included in the analyses, students must also have participated in the appropriate assessments of academic performance. Student records were merged with 2004 and 2005 NALT reading and math data (Grades 2-5), the grade one Oral Reading Assessment and Kindergarten Assessment (pre-K, Kindergarten) measures.

Table 1. 2004-05 Core Knowledge continuously enrolled participants

Grade	Dowling N	Longfellow N	Total	Assessment
Pre-K		33	33	KA
Kindergarten	71	46	117	KA
1	61	42	103	ORA
2	73	41	114	NALT Read & Math
3	69	29	98	NALT Read & Math
4	76	29	105	NALT Read & Math
5	85	32	117	NALT Read & Math
Total	435	252	687	
% Lunch	43%	80%	57%	
% ELL	15%	26%	18%	
% Spec Ed	9%	23%	15%	

A stratified random sample of students who were continuously enrolled in the district and did not participate in the Core Knowledge program, were selected as a matched comparison cohort. For grades 2-5 the total number of Core Knowledge participants with valid test information was 241. For the pre-K/Kindergarten and first grade participants, the total number of students with valid test information was 103 and 95 respectively.

Analysis

The purpose of this evaluation is to answer the following questions about the second year implementation of the Core Knowledge program:

1. Did achievement scores among students who participated in the second year of Core Knowledge implementation improve compared to the previous year?
2. Did achievement scores among students who participated in the second year of Core Knowledge implementation improve compared to non-participants?
3. If improvements in achievement were observed, did results differ by grade or location?
4. Does the length of exposure to Core Knowledge activities have an impact on student achievement?

To answer the first question, NALT reading and math growth scores from 2004 to 2005 were compared for all continuously enrolled program participants, grades 2-5. Growth scores are divided into three categories: 1) students making less than one year's growth; 2) students making one year's growth; and 3) students making more than one year's growth. For this analysis, improvement in academic achievement is defined by improvement in the percentage of students moving from level one to level two or three. At grade 1, ORA benchmark levels were compared for 2004 and 2005. ORA reading skills are divided into two levels; 1) not-on-track to reach MCA grade 2 reading proficiency (less than 60 wpm); and 2) on-track to reach MCA grade 2 reading proficiency, (60 wpm or more). For the kindergarten students, combined performance on the KA in phonemic awareness and alphabetic principles were compared. Proficiency levels on the KA are defined by students' ability to reach benchmarks in both phonemic awareness and alphabetic principles. Improvement in academic achievement on the KA and the ORA is defined by the percentage of students moving from level 1 (not

proficient) to level 2 (proficient). Group means were compared using analysis of variance (ANOVA).

To answer the second question, a non-equivalent control group design was employed to investigate NALT growth scores between continuously enrolled Core Knowledge participants and their non-participating (control group) peers. The same method was used for the pre-K through grade one, only using KA and ORA data rather than NALT growth indicators. Data were analyzed using analysis of covariance (ANCOVA) to minimize potential nonequivalence effects by controlling for academic performance in 2004. The control group was selected by identifying all students in the district from the same grades as participants who were continuously enrolled in another non-alternative MPLS. site. A stratified random sample from this group was then selected as the comparison cohort.

In order to answer the third question, a regression model with planned comparisons was used to determine the strength of academic achievement over two years by grade and location. If the overall model is significant, planned comparisons for grades and location were planned to further explore the nature of the relationship.

The final question was address by using specified regression equations to determine if any differences exist in academic achievement between students who were continuously enrolled in the Core Knowledge program for one, two, or three full years. Number of program years was used as the independent variable and the dependent variable was the same as that identified for each grade, or grade cluster, in Question 1. Follow-up comparisons for significant overall models were then planned.

Results

Question 1 – Academic performance among Core Knowledge Participants

Grades 2-5 - NALT Reading and Math Growth Rates

Table 2 shows the summary results for NALT math and reading growth rates among grade 2-5 Core Knowledge participants. To be included in the analysis, students had to be continuously enrolled at a participating site for two consecutive years and have NALT growth information available. For any given student, growth is determined by subtracting the 2005 scale score from the 2004 scale score and comparing it to expected growth. Any student meeting or exceeding their expected growth score is counted as making about one year's growth or more.

Reading comparisons show that among continuously enrolled Core Knowledge participants, the number of students making about one years growth did not significantly change from 2004 to 2005 (t=-1.72; p.=.087). The same interpretation is noted for the math comparison as well (t=1.48; p.=.140). In other words, students in grades 2-5 who were continuously enrolled in the Core Knowledge program in both 2004 and 2005 did not show a significant change in their level of performance in reading and math.

Table 2. NALT one-year's growth averages for Core Knowledge participants.

	Group	Mean M	Diff	df	t	p.
NALT Reading	2004	.707				
	2005	.612	-.096	156	-1.72	-.087
NALT Math	2004	.721				
	2005	.799	.078	153	1.48	.140

Kindergarten KA & Grade 1 ORA – participant performance

Table 3 shows the results for both KA and ORA comparisons. For each grade level, CK participants in 2005 were compared to 2004 students at the same sites. KA results show that there was not a significant difference in the percentage of students reaching level 2 performances in alphabetic principles and phonemic awareness as compared to kindergarteners enrolled at the same CK sites in 2004 ($F_{1,209}$=1.171, p.=.279). This result was also true for grade 1 student performance on the ORA. The percentage of CK participants reaching 60 wpm or more on the ORA was not significantly higher in 2005 as compared to CK participants in 2004 ($F_{1,205}$=.623, p.=.431).

Table 3. 2004-2005 comparisons results for CK participants on the KA and ORA

	Group	M	Mean Diff	df	t	p.
Kindergarten	2004	.384				
Assessment	2005	.313	-.071	1,209	-1.09	.279
Oral Reading	2004	.436				
Assessment	2005	.491	.051	1,205	.789	.431
Kindergarten	Longfellow	.458				
Assessment High-5	Other	.433	.025	1,52	.180	.858

A final component of Question 1 involves the academic performance of Kindergarten students who were enrolled in the Hi-5 program at Longfellow in 2004. Again, the percentage of students reaching Level 2 on the ORA in both phonemic awareness and alphabetic concepts was used as the dependent variable. The final section of Table 3 shows the results of this comparison. There was not a significant difference between kindergarteners previously enrolled in the Dowling Hi-5 program and non-participants on the ORA levels ($F_{1,52}$=.033; p.=.858).

Question 2 - Academic performance between CK Participants & non-Participants

Grades 2-5 - NALT Reading and Math 2005 performance vs. non-participants

Table 4 shows the results for both reading and math comparisons. The percentage of students making about one year's growth or more was used as the dependent variable for both analyses. Reading and math performance in 2005 was compared between continuously enrolled Core Knowledge participants and a matched sample of continuously enrolled students in MPLS. who did not participate. An ANCOVA model was used to control for the effects of prior achievement differences (2004 NALT growth percentages) in the two groups.

Table 4. ANCOVA Summary Table

	Adjusted Growth Means					
	Core Knowledge Participants	Control Group	Df	ms	F	p
2005 NALT Math Growth	.801	.577	315	3.914	19.073	.000*
2003 NALT Reading Growth	.621	.585	317	.107	.432	.511

* Significant at the p.<.05 level

While math performance did not change significantly among CK participants from 2004 to 2005, results show that compared to their non-participating peers, 2005 math performance was significantly higher ($F_{1,315}$=19.07, p=.001). However, this was not the case for reading performance. Reading results show that, compared to non-participants, Core Knowledge participants did not have significantly higher growth rate percentages in 2005 ($F_{1,317}$=.432, p=.511). Thus, planned comparisons were only conducted for the math results (see Question 3).

Kindergarten KA & Grade 1 ORA – 2005 performance vs. non-participants

Table 5 shows the ANOVA results between CK participants and non-participants on the 2005 Kindergarten Assessment. The percentage of kindergarteners who reached level 2 in phonemic awareness and alphabetic concepts in 2005 was not significantly different from participants in 2004 (see Table 3). Table 5 shows that this was also the case for kindergarten performance between CK participants and non-participants in 2005.

Table 5. ANOVA summary for 2005 Kindergarten Assessment

	Sum of Squares	df	Mean Square	F	p.
Regression	.289	1	.289	1.224	.270
Residual	54.332	230	.236		
Total	54.621	231			

Table 6 shows the ANCOVA results for student performance in 2005 on the ORA controlling for the effects of prior achievement using 2004 KA performance. Though not significant, there is some evidence that the percentage of CK participants making predicted MCA levels in reading is higher than non-participants. The 95% confidence interval for CK participants was between .410 and .584 compared to the non-participants group at .331 and .489.

Table 6. ANCOVA results for Grade 1 Oral Reading Assessment

	Adjusted Growth Means					
	Core Knowledge Participants	Control Group	Df	ms	F	p
2005 ORA WPM Proficiency	.497	.410	1,184	.347	2.119	.147

Question 3 – Planned Comparisons

Question 3 involved two sets of planned comparisons designed to better understand the nature of any observed improvements in academic achievement; grade by grade differences and site differences. Since improvements in measures of academic achievement were only observed for NALT math achievement, planned comparisons were conducted exclusively for this set of data. In order to have two years worth of growth scores, students must have taken the NALT over three consecutive years. For this reason, only grades 4 and 5 are included in this set of analyses. Table 7 provides summary results for both the grade comparisons and the site comparison.

Table 7. Planned comparisons for NALT math performance

Grade		Sum of Squares	df	Mean Square	F	Sig.
3-4	Contrast	2.602	1	2.602	11.416	.001
	Error	33.736	148	.228		
4-5	Contrast	1.375	1	1.375	7.921	.005
	Error	28.475	164	.174		
Site		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Dowling	Contrast	3.287	1	3.287	15.523	.000
	Error	59.507	281	.212		
Longfellow	Contrast	1.674	1	1.674	7.339	.007
	Error	44.697	196	.228		

Results show that math one-year growth rates were significantly higher for both grades 4 and 5 ($F_{1,148}$= 11.416, p.=.001; and $F_{1, 164}$= 7.921, p.= .005). Results were also significant for the comparisons by Core Knowledge implementation site (Dowling $F_{1,281}$= 15.523, p.=.001; and $F_{1, 196}$= 7.339, p.= .007).

Question 4 – Effects of program exposure

The final question is concerned with understanding what effect if any student exposure to CK implementation has on academic performance. Students were separated into three categories; students enrolled at the program site for three full years, two years and one year. Table 8 shows the breakdowns for each of these categories by grade.

Table 8. Years of exposure to CK implementation

	1 YEAR		2 YEARS		3 YEARS		
	N	%	N	%	N	%	Total
Year in School							
KNDG	94	89.5	11	10.5			105
1	17	17.7	65	67.7	14	14.6	96
2	14	14.0	12	12.0	74	74.0	100
3	25	28.7	6	6.9	56	64.4	87
4	19	19.4	13	13.3	66	67.3	98
5	20	19.6	9	8.8	73	71.6	102
PRE K	28	100					28
Group Total	217	33.2	116	20.7	283	46.1	616

Analyses were conducted for each grade level using the same dependent variables identified in Question 1. Pre-K student were omitted since there was only one year of exposure. Summaries for each grade are provided in Table 9. For each model years of exposure to the program was not a significant predictor of improvement in academic achievement. However, some effects were stronger than others, for example, the Kindergarten Assessment (R^2=.150) which suggests that pre-k program exposure may have some benefit for kindergarteners. Since there were no significant effects for any model, no follow up comparisons were conducted.

Table 9. Regression analysis for academic achievement by years of program exposure

DV		B	Std. Error	t	p	R^2
Grades 2-5	Constant	1.286	.218	5.890	.000	
NALT Reading growth level	YRS EXP	-.081	.081	-1.003	.317	.065
Grades 2-5	Constant	1.314	.208	6.304	.000	
NALT Math growth level	YRS EXP	-.004	.077	-.055	.956	.004
Grade 1	Constant	.288	.195	1.476	.144	
ORA level	YRS EXP	.107	.095	1.130	.261	.118
Kindergarten	Constant	.085	.173	.490	.625	
KA level	YRS EXP	.230	.151	1.526	.130	.150

Conclusions

For all students who participated in the 2005 Core Knowledge program, one year NALT math growth rates were significantly higher than their non-Core Knowledge counterparts. Follow-up analyses found that math one-year growth rates were significantly higher for all grades and at both locations where Core Knowledge was implemented. In other words, math one-year growth rate percentages were found to be significantly higher for all Core Knowledge participants combined, at every measurable grade, and at each implementation site. However, among participants, improvement in math achievement to did not increase significantly from 2004 to 2005.

While there was an effect for math outcomes, this was not the case for virtually all assessments of reading skills. No significant effects were found at any grade level, between participants over two years, or compared to non-participants. Understanding why there was an effect for math achievement but not reading requires additional investigation into the program. Unfortunately, reliable measures for pre-k, kindergarten,

and first grade are only available for reading skills and not math. Therefore, it remains uncertain what the effects of Core Knowledge implementation are on math skills at those grade levels.