STEM College and Career Readiness (CCR) Report

2014-2015

Eboni M. Zamani-Gallaher, John Lang, Edmund Graham, & Lorenzo D. Baber

COLLEGE OF EDUCATION AT ILLINOIS

The Office of Community College Research and Leadership (OCCRL) was established in 1989 at the University of Illinois at Urbana-Champaign. Our primary mission is to use research and evaluation methods to improve policies and programs to enhance community college education and transition to college for diverse learners in Illinois and the United States. Projects of this office are supported by the Illinois Community College Board (ICCB), along with other state, federal, private, and not-for-profit organizations. The contents of our publications do not necessarily represent the position or policies of our sponsors or the University of Illinois. Comments or inquiries about our publications are welcome and should be directed to OCCRL@illinois.edu.

This publication was prepared pursuant to a grant from the Illinois Community College Board (ICCB Grant Agreement Number 2015-63771).

Recommended Citation:
Zamani-Gallaher, E.M., Lang, J., Graham, E., & Baber, L.D. (2015, December). *STEM college and career readiness report: 2014-2015*. Champaign, IL: Office of Community College Research and Leadership, University of Illinois at Urbana-Champaign.

OCCRL
Office of Community College Research and Leadership

Office of Community College Research and Leadership (OCCRL)
Department of Education Policy, Organization and Leadership
College of Education
University of Illinois at Urbana-Champaign
51 Gerty Drive
Champaign, IL 61820

OCCRL
Office of Community College Research and Leadership

Table of Contents

Introduction

Arguably, while American citizens are more educated than ever before, there is a higher bar raised to compete in today's marketplace. Increasingly postsecondary education is necessary, as high school diplomas no longer secure gainful employment in the 21st century global knowledge-based economy. Four decades ago, little over ¼ of jobs required some college whereas by the 2020's two-thirds of all employment will require postsecondary education (Carnevale & Strohl, 2013). According to the Bureau of Labor Statistics (2013), it is projected that master's degree positions are the quickest growing group of careers between 2012-2022. However, the BLS notes the second fastest growing occupations are those requiring an associate's degree due to rapid growth in social assistance and healthcare industries anticipated to account for nearly 850,000 of the one million new jobs in this industry. Conferring an associate's degree is value-added given the difference in median earnings for a holder of a high school diploma versus an associate's degree in 2010 was $10,313.00 (National Center for Higher Education Management Systems, 2014).

The jobs of the future call for postsecondary attainment. Individuals lacking a college credential will experience greater challenges with finding and keeping gainful employment, for social and economic mobility. Unemployment among communities of color is highest among those without postsecondary education. Given the increasing population of racial/ethnic minority groups, access to quality educational opportunities across various communities is critically important for the nation. Hence, postsecondary education is central to having a higher quality of life given higher educational attainment correlates positively with higher earnings, better benefits, and more opportunities for advancement.

From 2007-2009, the United States experienced what is referred to as the Great Recession sparked by one of the worst business cycles for job creation during 2000-2007 as working-age adults made approximately $5,000 more in the year 2000 than in 2009 (Mishel, Bivens, Gould, & Shierholz, 2012). One means of rebuilding the economy and cementing the economic foundation for the future is through investment in education. According to Berger and Fisher (2013), in order to expand economic opportunity and for every citizen to realize prosperity, states must spend more on education. As a result, states can provide greater access to high quality schooling and strengthen the overall economy.

Given the devastating impact of the great recession, the fledgling economy prompted a dialogue regarding the need to revisit school-to-work and college preparation for

students during the Obama administration. In addressing the need for economic recovery and to ensure the country's international competitiveness, the Obama administration increased investments in P-20 curricular alignment improvements, promoting college/career readiness, raising academic achievement, and bolstering Science, Technology, Engineering, and Mathematics (STEM) education (especially among underrepresented groups) as a strategic means of aiding advancing a college completion agenda. Career and college readiness has received significant attention and has served as the centerpiece of many educational reform policies in recent years (e.g., Race to the Top (RTTT) initiative and Trade Adjustment Assistance Community College and Career Training (TAACCCT) components of The American Recovery and Reinvestment Act (ARRA) of 2009). While postsecondary access and participation have improved, college completion rates have been surpassed by 10 other nations (Mettler, 2014). In highlighting how college readiness intersects with college access and completion, Tierney and Sablan assert, "Getting into college becomes only one part of the college access issue. Preparation for college level work is a key factor in persistence (2014, p. 944).

Addressing Academic Underpreparedness

Only 26% of students that take the ACT meet the benchmarks in each of the four subject areas (math, reading, science, and writing) according to the authors of *The Condition of College and Career Readiness* (Mattern et al., 2014). In addition, Mattern et al. (2014) within the one-quarter of students that are college ready, there are racial/ethnic differences relative to those that are academically prepared in all four areas (i.e., 43% of Asian American, 33% White, 14% American Indian, 10% Hispanic, and 5% African American students met all four benchmarks). While the aforementioned figures are troubling, it is also clearly established that some individuals in this society have more access to excellent schools, college preparatory curriculum, and higher wages than others contingent on race/ethnicity, socioeconomic status, geography, and other factors.

College-readiness has been associated with key student demographic variables, such as race/ethnicity, income, and parent's highest educational attainment. Students of color are more likely to come from the low income backgrounds, are exposed to less rigorous curriculum, are first-generation college-goers, and subsequently have high rates remediation. In particular, African Americans and Hispanics are less likely to attend and complete college than their White counterparts. A huge disconnect existed in our education system as high school students met all the graduation requirements set by the state to earn a high school diploma, but lacked the skills to enter the workforce or post-secondary education without remediation. In an effort to evaluate whether the sequence

of curriculum for CTE students resulted in greater college and career readiness, less likelihood of remediation, Bragg, Loeb, Yoo, and Zamani-Gallaher (2007) found college readiness differed among tech prep participants compared to non-participants. Additionally findings from Bragg, et al (2007) showed differences in college-readiness by race/ethnic group membership, which favored White students, as the odds of White students needing remediation were less on average due to higher-level mathematics and English course-taking patterns when compared to African American and Hispanic students. Research by Royster, Gross, and Hochbein (2015) examined timing to first-time college readiness in English and math of a longitudinal cohort of 6,443 students' diverse students in an urban public school district using event history analysis. The authors found that high school students were redirected off-track and that 8th grade was the most critical in student's chances of being on the college-ready trajectory. Additionally, parent's highest educational attainment and college preparatory courses were associated with college readiness particularly in math.

In an effort to curb academic skill gaps, improve access to postsecondary education, and increase college completion, many states introduced new standards to ensure students that are college and career ready. The Common Core State Standards were introduced as an accountability tool and assessment system to align requisite core academic skills necessary for college (Darling-Hammond, Wilhoit, & Pittenger, 2014). By 2015, the Common Core State Standards were adopted by 43 states as a means to equipped students with the (Common Core State Standards Initiative, 2015). The State of Illinois adopted the Common Core Standards in 2010 and implemented the new standards thought to better prepare students for work and postsecondary opportunities.

College and Career Readiness: Illinois Policy Context

Across the country, many states have launched college and career readiness initiatives to close achievement gaps and equip high school students with the skillsets for successful transition to college or the workforce without developmental education in their future. "College readiness can be defined operationally as the level of preparation a student needs in order to enroll and succeed—without remediation—in a credit-bearing general education course at a postsecondary institution that offers a baccalaureate degree or transfer to a baccalaureate program" (Conley, 2007, p. 5). Increasing the numbers of students matriculating to college without remediation suggests identifying specific knowledge and skills (i.e., agreed upon standards as to what is "college-level") required of students to be successful in college (Conley, 2005; Long, 2014; Merisotis & Phipps, 2000). However, estimates suggest 30 to 70 percent of students require remediation as they missing the necessary skills and have limited

knowledge for college-level academic success (Bettinger, Boatman, & Long, 2013; Complete College America, 2012; Merisotis & Phipps, 2000).

College attendance is correlated with academic preparation; hence, students with academic skill gaps are less likely to enroll and have greater problems persisting in college (Carnevale, Rose, & Hanson, 2012). One of the problems that college remediation presents are increased expenditures to states, added costs for students, higher likelihood of student attrition and for those that matriculate, longer periods to degree conferral (Breneman & Haarlow, 1998; Jacob & Lefgren, 2004; Long, 2014; Martorell & McFarlin, 2011; Merisotis & Phipps, 2000).

To address the rising costs developmental education and number of students with remedial needs, some states have passed legislation to address increasing college-readiness. Given that developmental courses are not credit bearing and do not count toward degree requirements, in 2013, Florida legislators lifted mandatory remediation for high school students that failed to have college-level placement test scores. The state's changes in mandated remediation laws has result in decreasing pass rates in math and English (e.g., Miami-Dade College college-level math rates dropped from 55.7% to 46.8%) illustrate ill-prepared students taking college level courses in greater numbers (i.e., 2 out 10 passed with a C or better spring 2014) and subsequently failing (Smith, 2015).

Various measures to curb the need for remediation are being adopted across states, many of which consider college remediation as connected to curriculum alignment with secondary education (Long, 2014; Merisotis & Phipps, 2000). Legislators in Illinois have aimed to remove the need for remediation and increase college readiness by considering student's high school curriculum. In 2007, legislation enabling college and career readiness in Illinois was passed by the Illinois General Assembly.

The Illinois College and Career Readiness Pilot was authorized establish of community college and high school partnerships that align K-12 English and mathematics curriculum to prepare students for college-level courses and successful postsecondary transition (PL 095-0694, Section 5 of the Public Community College Act, Sec. 2.24). From 2007-2010 and with a three-year extension of the amendment from 2010-2013, the Illinois College and Career Readiness pilot sought to curb the need for remediation following high school by providing academic interventions in mathematics and English during the secondary years (Bragg & Taylor, 2014).

Seven community colleges participated in the initial pilot program between 2007-2010 (for additional details see Bragg, Baber, & Castro, 2011; Bragg, Baber, Cullen, Reese, & Linick, 2011; Castro, Bragg, Khan, Baber, & Common, 2010; Khan, Baber, Castro, Sanders, Bragg, & Common, 2009; Taylor, Linick, Reese, Baber & Bragg, 2012). The pilot program was extended from 2010-2013 and each pilot site was to continue addressing core elements of PL 095-0694, Section 5 of the Public Community College Act, Sec. 2.24 (i.e., diagnosis of college readiness aligned to ACT scores or alternative college placement exam scores; decrease need for college-level remediation, align high school and college curriculums, provide academic and student support resources to enrich high school senior year through remedial or advanced course work with other interventions; and to develop appropriate evaluation processes that measure effectiveness of interventions to increase college readiness).

When considering academic progress by community college pilot sites during the 2011-2012 fiscal year placement level gains occurred during this period suggestive of less need for remediation and placement into higher level courses following participation in CCR academic interventions (Linick, Taylor, Reese, Bragg, & Baber, 2012). However, the increase in raw test scores varied from site to site, English interventions were more likely to see an increase from pre-test to post-test than placement of students' participation in math interventions.

For states that have fidelity in testing 100% of their students using the ACT test, roughly 2 out of 5 Illinois high school students are college-ready by ACT college-readiness benchmarks. Students have meet ACT Benchmarks if their scores on subject-area tests align with the cut offs. These scores suggest a 50% likelihood of obtaining a B or higher and 75% probability of earning a C or better in credit-bearing college courses during the first-year (see Tables 1 and 2).

Table 1. ACT College Readiness Benchmarks

College Course	**ACT Subject-Area Test**	**ACT Explore® Benchmark Grade 8**	**ACT Explore® Benchmark Grade 9**	**ACT Plan® Benchmark**	**The ACT® Benchmark**
English Composition	English	13	14	15	18
College Algebra	Mathematics	17	18	19	22
Social Sciences	Reading	16	17	18	22
Biology	Science	18	19	20	23

Table 2. Percent of Students College-ready: Illinois in contrast to other states with 100% ACT-tested graduating students (2014)

Rank	State	% tested	# tested	% Ready
1	Illinois	100%	158,000	41%
2	North Dakota	100%	7,227	41%
3	Colorado	100%	56,510	39%
4	Montana	100%	9,611	39%
5	Utah	100%	35,074	39%
6	Michigan	100%	119,900	35%
7	Wyoming	100%	6,098	34%
8	North Carolina	100%	97,443	33%
9	Kentucky	100%	48,845	31%
10	Tennessee	100%	69,505	30%
11	Louisiana	100%	49,178	27%
12	Mississippi	100%	28,481	21%

Although funding for the Illinois College and Career Readiness pilots was eliminated in 2012, the Illinois's Race to the Top (RttT) Grant provided funding for seven community colleges to partner with RttT schools to integrate CCR with a STEM focus from 2013-2015 (Baber, Graham, Reese, Taylor & Bragg, 2014). Referred to as STEM CCR, underscores the important relationship between high schools and colleges in resolving the need for remediation and assuring college readiness. The core concept of the earlier CCR pilot projects and the STEM CCR program is that students have the opportunity to take college preparatory courses in high school however, if remediation is necessary that can participate in academic interventions to remediate skill gaps prior to high school graduation. Research on college success rates of recent high school graduates conducted by the Maryland Higher Education Commission (1996) found those that did not complete college-preparatory courses did not perform as well and were more apt to require remediation than their counterparts that completed college-preparatory courses, which earned higher grades in their first-year English, and math college courses. Applying Maryland's findings to the logic undergirding STEM CCR, students that

complete college preparatory academic interventions would be less likely to require college-level remediation.

Evaluation Questions, Data Sources, and Evaluation Activities

The aim of this report is to provide additional detail regarding the implementation of the STEM CCR program from 2013 to present. In particular, the following questions served to guide the evaluation of the STEM CCR programs during the 2014-2015 academic year.

- How did the community college sites understand and implement the STEM CCR model?
- What variations in the model occur and why do they occur?
- How are STEM CCR program partnerships and implementation viewed by collaborating high schools?
- What are students perceptions regarding the STEM CCR program and how do they characterize their experiences with the program?
- What are the effects of student motivation, skills gained to succeed in college-level courses, highest educational degree aspirations, and GPA on the likelihood of perceived math improvement among STEM CCR participants?

The OCCRL has three primary mechanisms for collecting student level data: 1) student intake forms, 2) student surveys, and 3) the STEM College and Career Readiness (CR) Data form. STEM CCR administrators are critical to the data collection process as they assist in administering tools and recording data throughout the course of the evaluation. Data collection begins with the student intake form. The student intake form documents STEM CCR participation, collects initial demographic data (e.g., race/ethnicity, gender, classification, etc.). The student intake form also helps to distribute STEM CCR IDs, an 11 digit ID that allows the OCCRL to track student participation and progress longitudinally. STEM CCR personnel administer student intake forms to students on the first day of the intervention and input the information from the student intake forms into a Google Drive folder through a link provided by the OCCRL.

The second mechanism for collecting student level data is student surveys. Student surveys assess student experience while participating in STEM CCR during a given term. There are five constructs by which students are asked to share their experiences beginning with 1) learning experiences, 2) learning outcomes, 3) college experience, 4) college and career planning, 5) college and career readiness. A link to the survey is

provided to the sites and STEM CCR personnel are tasked with administering the survey at the end of each intervention that usually coincides with the end of the semester.

Lastly, student data are collected through the STEM College and Career Readiness (CR) Data form which records student participation and progress longitudinally. The CR form is a robust data collection tool by which STEM CCR personnel from each site input data related to the following categories: 1) student background data, 2) high school data, 3) intervention data, and 4) community college data. Sites are asked to report outcomes such as high school GPA and highest level of math taken in addition to intervention grades and participation. The CR for is to be completed by September 15 for the preceding summer term, January 15 for the preceding fall term, and July 15 for the preceding spring term. CR form data is submitted directly to the ICCB and then forwarded to the OCCRL for our analysis.

Once information is collected across data sources, the OCCRL evaluation team does a crosswalk between the various data points in preparation for analysis. For example, student surveys do not ask students to report race/ethnicity; however, the student intake form does so the data points are matched across different data sets to analyze student participation, student survey responses, and outcomes.

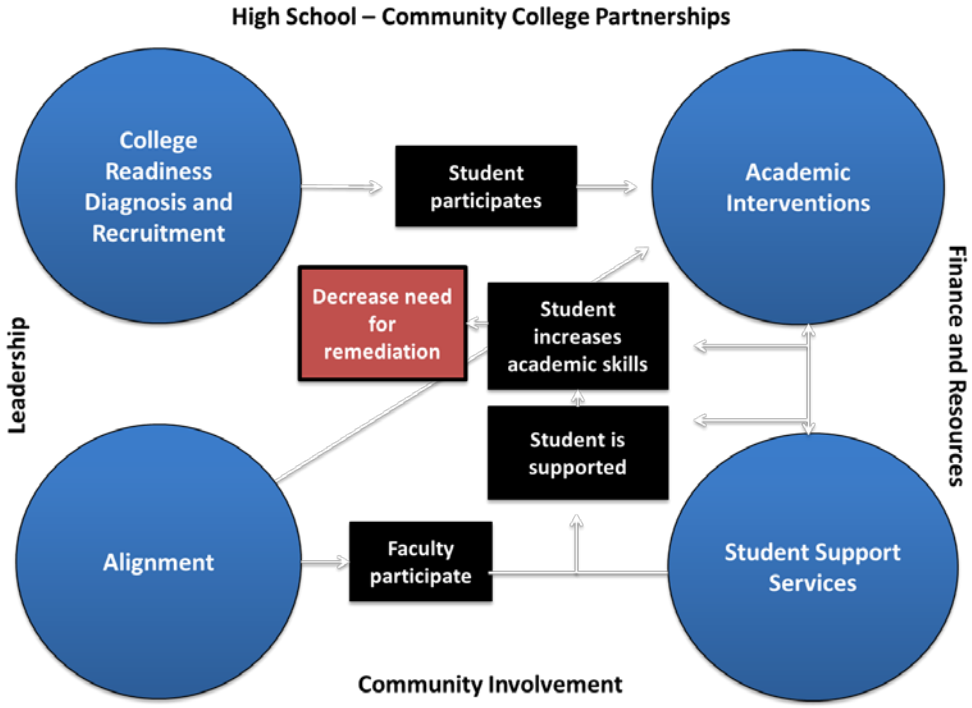
For FY2015 activities, we reviewed program documents from the colleges and high schools, prior annual reports, attended the STEM CCR winter meeting to hear updates from the colleges on curriculum alignment and implementation. In addition, we followed up with sites regarding STEM CCR protocols (i.e., consent forms, irregularity with STEM CCR student IDs, and sent reminders to have participants complete the student survey at the end of the academic intervention. We conducted semi-structured interviews with high school partners during spring 2015, coded open-end questions from the student surveys, and conducted quantitative data analysis of surveys submitted between fall 2013 through spring 2015.

This report summarizes developments with implementation of STEM CCR programs across sites over the past year. In particular, we highlight promising practices and persistent challenges with the college sites program implementation as well as share STEM CCR program perspectives of high school partners and student participants.

Introduction of Model to STEM CCR Administrators

Evolving from the CCR pilot (2007-2012), the College and Career Readiness model was the foundation for the design and implementation of STEM CCR. The model includes four dimensions: College Readiness Diagnosis and Recruitment; Academic Intervention; Student Support Services; and Curricular Alignment. At the initial STEM CCR meeting on December 14, 2102, OCCRL researchers (Lorenzo Baber, Debra Bragg, George Reese, and Jason Taylor) introduced components of the College and Career Readiness model. During this meeting, ICCB staff introduced a draft of the STEM Intervention Model.

Figure 1. College and Career Readiness Model



During this meeting, non-negotiable elements of the STEM CCR Intervention Model were introduced:

Math Only

- Target low need students for a summer bridge and medium-to-low need for Fall and Spring semesters
- Minimum of one intervention for a summer bridge, one intervention in the fall semester, and one intervention in the spring semester

- A summer bridge delivered on community college campus; the fall and spring semester interventions delivered at the high school
- Pre-Testing/Post-Testing of students

Additionally, STEM CCR sites were required demonstrate fidelity to the College and Career Readiness Model; participate fully in data collection and evaluation efforts; and participate in professional development and mentoring.

On February 25, 2013, OCCRL hosted a webinar for administrators of the STEM CCR interventions at the community college sites. During this meeting, OCCRL researchers (Lorenzo Baber, George Reese, and Jason Taylor) presented cross-site themes related to the dimension from the final year of the CCR pilot. OCCRL researchers also shared evaluation reports from CCR pilots that included a summary table of each dimension to provide examples for STEM CCR administrators. The Webinar concluded with administrators from two of the CCR pilot sites (Amanda Starkey at Southwestern Illinois College (SWIC) and Beth Beno at South Suburban) sharing lesson they learned from developing and implementing new programs in their community college district.

Implementation of College Readiness and Diagnosis Dimension

In general, interventions have closely followed the College Readiness and Diagnosis dimension of the STEM CCR Model. Each site focused on low-need students for the Summer Bridge and medium-need to low-need for the academic year intervention. While each site used Compass testing to diagnosis students, cut-off scores varied across sites.[1] Recruitment strategies also varied across sites. A few sites connected recruitment for STEM CCRT to initiatives previously established. For example, Harold Washington College offered the Summer Bridge STEM CCR intervention to students who failed to place into the Dual Enrollment program. Other sites offered Compass testing to all juniors and seniors at partner high schools, offering the STEM CCR intervention to students who met low-need or medium-need standards. Most sites supplemented recruitment through testing by eliciting recommendations from high school guidance counselors for potential students.

The largest challenge to following the College readiness diagnosis and recruitment dimension of the CCR model has been the establishment of the pre-testing/post-testing of students participating in the program. Many sites have found it difficult to establish timeframe for pre-testing all student participants, particularly those who may have not taken the Compass test but were recommended for the program by guidance

[1] For details, see Baber, Graham, Reese, Taylor and Bragg (2014)

counselors. Sites also had difficulty using the same test for the pre-testing and post-testing due to financial or time constraints. For example, high schools may have been reluctant to make their students available for another standardized test, particularly during the spring semester. As such, they would rely on information from other tests to identify potential students (e.g. ACT sub-scores).

Administering post-tests presented unique challenges as well. Several sites were reluctant (or faced reluctance from high schools) to incorporate post-test into the final grades of students. As such, administrators reported that post-testing was viewed by many students as an 'extra-test' with little consequence There was better success with Pre-testing/Post-testing during the summer bridge as community colleges could point to tangible outcomes for students (e.g. placing out of a remedial math course at the community college).

Implementation of Academic Interventions

Overall, STEM CCR sites have been consistent in the implementation of the academic intervention dimension of the CCR model. In the initial year (2013), there were some significant challenges to developing the summer bridge implementation. Many of these were related to the timing and processing of STEM CCR funding to the institution and/or the department responsible for developing the intervention. Since that period, most sites have adhered to the model, developing a Summer Bridge intervention delivered at the community college and academic year intervention (both fall and spring) delivered at partner high schools. The duration of the summer bridge have varied across institutions, from four to six weeks. For both the summer intervention and the academic year intervention, sites are using a self-paced learning program (e.g. Wolfram Alpha; Pearson; MyMathLab) to supplement traditional instruction of math. For the summer bridge program, facilitators of the intervention tend to be community college instructors, while high school faculty generally led academic year interventions with support from community college faculty.

The most challenging implementation of the CCR model has been the delivery of interventions at the high school during the academic year. Success of implementation appears related to the strength of the relationship between the community college and partner high school prior to STEM CCR grant. Sites with strong historical relationships have been able to develop and implement an intervention that is incorporated into the high school curriculum. For example, Heartland College, based on previous success, worked with Unit 5 high schools (Normal Community High Schools and Normal Community West) to incorporate the STEM CCR intervention into a regularly

scheduled, credited math course at the high school. In contrast, at Illinois Central College, initial delivery of an academic year intervention was delayed as STEM CCR administrators reported miscommunication with their initial partner high school on the details, goals, and outcomes of the intervention.

Implementation of Student Support Services

For both the summer-bridge and academic year interventions, alignment with the student support services dimension of the CCR model appeared be a significant challenge. Alignment was more consistent during the summer bridge intervention when students were on the community college campus. STEM CCR administrators indicated that proximity to student services, as well as more control over intervention scheduling allowed for better alignment with academic components of the student support dimension during the summer bridge. Most sites (all, but one) provided student participants with a college identification card during the summer bridge intervention. This allowed student access to academic support services such as computer labs, math tutoring, and the college library.

To address non-academic support, STEM CCR administrators scheduled a separate time for student services officer to present relevant materials to students. At most sites, this included career counseling, information on financial awareness, assistance with the FASFA application. During the academic year, interventions included non-academic support activities more consistently than academic support activities. While most sites planned to implement a mentoring component to Summer Bridge and academic year interventions, success was inconsistent and, ultimately, the mentoring component did not survive at any site by year three at any of the sites.

Implementation of Curricular Alignment

Overall, implementation of curricular alignment has not been a direct priority among STEM CCR sites. Most sites have indirectly addressed the curricular alignment dimension through instructional collaboration between high school and community college faculty during interventions. For the summer-bridge, community college faculty member is leading the course while high school faculty serves as an 'embedded' tutor. The roles are reversed during the academic intervention at the high school. While curricular alignment discussions take place informally among the faculty, most sites have not developed a formal discussion of alignment issues (e.g. Formal HS-CC committee or council). While less direct that the dimension offered by the CCR model, emphasis on informal, faculty-to-faculty discussions about curricular alignment has potential for sustainability beyond the lifecycle of the STEM CCR grant. Relationships

generated through this working collaboration moves away from abstract conversations about issues related to curricular alignment, replaced by conversations shaped by shared experience in a classroom context. With this approach, scalability, that is increasing the number of HS-CC faculty collaborations, remains a significant issue.

STEM CCR Program Perspectives of High School Partners

In the first-year evaluation (AY 2008) of the CCR pilot program, OCCRL states:

> Underlying the CCR Act is the assumption that high schools and colleges are responsible for ensuring that high school students are prepared to enter college ready to learn at the college level and that they are aware of the college standards that await them. (ii).

OCCRL continues: "The CCR Act tests the hypothesis that misaligned curriculum between high school and college creates remediation problems for students who seek to enter college-level course work …" (1). Accordingly, partnerships and alignment between community colleges and surrounding high schools have been central to college and career readiness in Illinois from the beginning. When the CCR pilot program transitioned into STEM CCR, the role of partnerships remained essential to the very design of the readiness intervention. Accordingly, annual evaluations of the CCR pilot program and, subsequently, STEM CCR have focused in large part on descriptions and analyses of these partnerships.

During the first year of the STEM CCR grant, OCCRL reported on interviews conducted with community college administrators, coordinators, and faculty, which covered seven areas of STEM CCR: Program Goals, Program Design, Partnership Alignment, Student Diagnosis and Recruitment, Academic Intervention, Contextual Factors, and Successes and Challenges. Now, at the conclusion of the second year of the grant, OCCRL turns to a description and analysis of STEM CCR and the partnerships involved based on interviews conducted with a sample of high school participants. The aim is to deepen an understanding of the development of STEM CCR by drawing on the experiences and expertise of the high school side of the partnership equation. For the present report, OCCRL identified four high schools along to the continuum of community college settings and locations in Illinois. The interviewees also represent the range of high school leadership involved in the STEM CCR program, from principal and program coordinator to teacher and guidance counselor.

The interviewees[2] are a Math instructor at a STEM CCR high school partner of Illinois Central College in Peoria, IL, a STEM CCR Program Coordinator at a STEM CCR high school partner of Olive-Harvey College (Part of the City Colleges of Chicago) in Chicago, IL; a Guidance Counselor (and former math teacher) at a STEM CCR high school partner of John Wood Community College in Quincy, IL and Principal at a STEM CCR high school partner of Olney Central College (part of the Illinois Eastern Community Colleges district) in Olney, IL.

Evaluation Design

The categories and questions used for the high school interviews draw on previous surveys and interviews of STEM CCR community colleges, from the initial Project Design survey in the spring of 2013 to the most recent Program Implementation Profile in the summer of 2014. The high school interviews were divided into four parts.

Part 1 focuses on the STEM CCR program partnership from the high school perspective. The interviewees were asked to describe the reasons for entering into the partnership, the roles and responsibilities of high school personnel in program design and implementation, and the way in which the high school communicates and collaborates with the partner community college.

Part 2 focuses on program design and implementation. The interviewees were asked to describe the mathematics course content of the program and the way in which the STEM CCR program aligns high school and community college math courses and curricula. Interviewees were also asked to describe student diagnosis, recruiting and readiness evaluation, as well as high school faculty qualifications and involvement. In addition, interviewees were asked to describe the academic- and career-related support services provided to students alongside the math content.

Part 3 asked the interviewees to step back and describe the big picture in terms of their goals and objectives for the academic year, as well as successes and challenges since the beginning of their involvement in STEM CCR.

Part 4 asked the interviewees to look ahead in several respects. The interviewees were asked to describe their long-term plans for the STEM CCR program and how they align with other plans, programs, or initiatives at the high school. The interviewees were also

[2] To provide some level of confidentiality, names of interview participant and partner high school are not used in this report. The people interviewed are referred to by their professional title (Math Teacher, Principal, Guidance Counselor) and/or the term 'interview participant' or 'interviewee.'

asked to describe the main obstacles that stand in the way of long-term success. Finally, the high school interviews turned to an area not covered in previous evaluations. Since current funding for STEM CCR, through the Illinois Race to the Top Grant, is set to expire in December 2015, a central policy question is how to proceed beyond the present iteration. Accordingly, the interviewees were invited to share any ideas they might have for the re-design of a STEM CCR program and to share any advice they might give to new high school-community college partnership in any new phase of STEM CCR.

Perspectives from Secondary Math Teacher at Illinois Central College Partner School
This high school partner of Illinois Central College is located close to the campus of Illinois Central College. The interviewee notes that close ties between the high school and the community college exist in that a large number of seniors attend Illinois Central after graduation. Accordingly, this high school partner embraced the STEM CCR program to better align the path their students took from high school to college math at Illinois Central.

The partnership started in the spring of 2014, when the interview participant began working with the math department at Illinois Central to design the program. STEM CCR launched in the fall of 2014 with two main elements. First, a math curriculum based on MATH 099, which is the remedial math course Illinois Central. The high school partner curriculum focuses on beginning algebra and touches on intermediate material as well. Second, the program focuses on seniors by offering them a fourth-year (yearlong) math elective. "Any senior to have successfully completed Algebra 1, Geometry, and Algebra 2 is eligible to take this course. We recommend the course to students who are weaker mathematics students but are interested in taking a 4th year of math." During registration, high school counselors work with students to "determine whether this course would be appropriate for … their senior year." The interviewee notes: "Typically, the students who would sign up for the course are [average to low-performing] mathematics students who would benefit with a review of basic mathematics." Accordingly, many of the students have already covered the material in previous courses and STEM CCR is a way to refresh and reinforce to prepare them for college math.

The class sessions are described as follows:

> Students typically start with a small group activity to investigate a new concept. This is followed by a whole class discussion to further investigate or provide more information about the concept. There is usually another chunk of time

> spent working in small groups and then any remaining time is spent practicing the concept of the day. Students are expected to actively participate in small group and whole class activities on a daily basis.

Alongside math content, the program invited "guest speakers from ICC in order for my students to learn more about financial aid, counseling services, and career services." The interview participant continues: "Most of the discussions were centered around transferring to ICC and what to expect during the first year of college since most of the students taking the course will be attending ICC in the fall."

The partner high school assesses readiness in two ways: "Students took the COMPASS test at the beginning of the school year and will be tested again before graduation to determine their improvement. Students are also using ALEKS to determine their readiness of specific algebra skills."

Overall, the math teacher at the partner high school believes the students saw value in the program. "Students who are signed up for this course are taking it as an elective. They are also planning to attend ICC in the fall, so they have some motivation to do well. The format of the class is also different than a typical mathematics course, which seems to interest the students more."

The interview participant describes the challenges as mainly learning how best to implement the program: "As this was the first year of implementation, my main goal was to get a good grasp on the curriculum and follow the format of the textbook as much as possible. This has allowed me to determine what types of changes and additions I will make to the curriculum for next year."

The interviewee continues: "A big challenge for me was getting used to the format of the course. I'm not used to having such a large portion of class time spent in group or whole class discussions. Throughout the year I have gotten used to this format though and enjoy talking with the students about different mathematical situations."

The interview participant notes some mix-ups in recruiting and registration, and room for improvement:

> Initially there were some students signed up for the course who were improperly placed (had not passed Algebra 2 or should have been taking Pre-Calculus). There were also a few students that had signed up for the course not knowing exactly what to expect. We are hoping to avoid this situation next year by giving

> counselors a clearer set of guidelines on what type of student would benefit from the course. I have also asked the Algebra 2 teachers to talk to their students about the course.

On future plans, the interviewee states:

> We hope to continue offering this course at [Partner High School]. Our department feels that we need to offer something to our seniors who are college bound but not necessarily interested in a career that requires advanced mathematics. We also feel that it is important to work with ICC since such a large number of our students start their college programs there.

The main challenge will be resources: "Funding for the course is probably the biggest obstacle. Since this is an elective, it would be the first class to get cut if we didn't have enough staff available for our other courses."

Finally, the math teacher at the partner high school offers the following advice to new partnerships and programs:

> The high school teacher needs to build a solid relationship with a mentor from the community college. Observe the college classroom, ask questions, make sure that the expectations of students and teacher are clear. Also, don't expect complete success with the program in the first year. Be willing to adjust and adapt your teaching style to fit the needs of the course and students.

Perspectives of STEM CCR Program Coordinator, High School Partner of Olive-Harvey College in the City Colleges of Chicago

The STEM CCR program coordinator came to the grant by way of myriad other responsibilities, serving as an English teacher and the coordinator for dual credit and Advanced Placement (AP) at the partner high school. The interview participant also serves as liaison to Olive-Harvey College, which is three miles away, by way of E 103rd St., in Chicago. It was in this context that STEM CCR administrators at Olive Harvey approached the interview participant about developing a STEM CCR program at the partner high school through the Illinois Race to the Top grant.

On the partner high school side, the interviewee is involved with every aspect of the program. As a liaison, there is regular contact with administrators from Olive-Harvey, to ensure curriculum coordination and alignment. The program coordinator manages program scheduling within the school and also with parents — since STEM CCR is

currently offered after school, coordinates student selection, arranges COMPASS testing, and attends the course regularly to monitor its development. The interview participant also recruits and supports qualified staff at the high school to implement the program. This includes a faculty colleague who helped to coordinate the program, and the STEM CCR instructor for the partner high school who also teaches the dual credit math course and is an adjunct faculty member with Olive-Harvey.

The focus of STEM CCR is students in their junior year, in order to prepare them for ACT and also for the possibility of dual credit courses senior year. Administrators at the partner high school look at PLAN scores from the previous spring (sophomore year) to assess who might benefit from STEM CCR. In particular, the program coordinator looks for students in the middle range of scoring, and who might benefit from a "bump up."

STEM CCR began in the fall of 2014 with eight students. The original design was an after-school program — Tuesdays and Thursdays for one hour — that would last for one-semester, with a new class starting in the spring. The partner high school and Olive-Harvey saw the need for more time, however, partly due to a final assessment showing additional room for improvement. Accordingly, the STEM CCR administrator at Olive Harvey "extended fall students for spring eligibility," developing a one-semester program into a full-year intervention.

The computer lab at the partner high school is the site of the program. The COMPASS test is used for pre- and post-evaluation. The program itself is self-paced, with one on one tutoring and support as needed. At times, the entire class will gather for "mini-lessons" if there is a common question. The interview participant notes that students developed a sense of community and team, and the feeling that "they were getting the support they needed." In addition, the students were "thrilled to have a college ID" and to feel a part of the college environment. The interviewee also felt that there was more that could be done including support and tutoring on the city college campus and library access and education.

The interview participant notes that the high school tried to recruit new students for spring semester, but only one new participant joined the program. The program coordinator attributes this to a limited number of interested students, who would have already signed up in the fall, and to the need for a bit more promotion and active recruiting for the spring. The interview participant notes that students during the fall showed consistent attendance and motivation. This remained the case, for the most part, though she reports less consistency and motivation spring semester. In the fall, the

high school provided snacks to students, a helpful ingredient for students trying to concentrate later in the day. Unfortunately, due to lack of funds the high school was not able to provide snacks in the spring.

The partner high school has focused on the math intervention to this point, meaning that the program did not include academic or career-related support services. In preparation for summer, the partner high school is developing a career side to the program using Gear Up, a financial literacy program. The program coordinator at the high school estimates that between twelve to fifteen students will participate through Olive-Harvey. The program coordinator would also like to develop business partnerships in the community to provide in school or field experience with real jobs and work settings.

Based on a broad assessment after the first year, the interview participant reports a basic re-design of the program: "We are looking now to take this after-school program and model it after [another Olive-Harvey high school partner], where they have it within a course because it is tricky at the end of the day … and it's hard to keep it going with attendance."

The program coordinator at the partner high school notes that the faculty colleague collaborating on the grant at the high school is supportive of the more "embedded" approach, and views it as a positive change that would not be an "intrusion or interruption" to current courses and curricula. The redevelopment is currently underway, as the interview participant coordinates with administrators at the STEM Center for Teaching and Learning at Olive-Harvey.

The interviewee also states that the redevelopment of STEM CCR is drawing from experiences of another high school partner for Olive Harvey. This model presents some challenges given the block schedule at the other partner high school, which is different from this high school partner's schedule. Thus, the redesign cannot be replicated exactly. Nevertheless, the program coordinator at this partner high school expressed confidence that the model can be adapted successfully to meet the needs of its students. "I am really motivated to make it work," she notes. The main challenge, however, is how to continue without additional funding and without detracting from other academic priorities.

The interview participant shared several ideas on how to develop the basic STEM CCR model in any new phase of the program. The interviewee suggested a problem-based

curriculum that "presents a problem to students at beginning that they can solve." The program coordinator further states, "Give them something to solve for. Then the program can provide them practice, support, scaffolding. And then they are creating and design something." This would also align with the partner high school's commitment to metacognitive student development by way of collaboration and critical thinking. The program coordinator also envisioned a clear scaffolding and alignment of all student assessments in contrast to the current regimes, which are not always seamless.

In sum, the interview participant describes the program and especially the sense of community that developed between students as "something that I think we really can build on." The program "provides support for these students so they can achieve success, can understand what success feels like, what success is." The interviewee offers the following advice to new programs and partnerships: "Grab the opportunity, and then you can work out the rest and make it fit. You can't go wrong."

Perspectives from Guidance Counselor,
High School Partner of John Wood Community College

Similar to the partnership at Olney Central, the STEM CCR partnership between John Wood Community College and one of its high school partners draws on the small community setting of about 1800 residents, and the longstanding relationship between the high school and the community college.

The coordinator of the Open Learning Center at John Wood initiated the partnership by approaching this eventual high school partner and proposing to "target students who fall below math readiness" using the grant funds. On the high school side, the guidance counselor embraced the idea given the "need to build student ability to prepare them for first level college math." The guidance counselor describes the partnership as "a perfect situation where you had people who were all willing to do whatever was necessary to get our kids what they need."

The guidance counselor at the partner high school brings two areas of expertise to the program - helping students with academic and career counseling as the school counselor and teaching math as a certified math instructor with years of experience. While the present evaluation will turn to limitations in this singular combination, the evaluation will also highlight the particular strengths of a one-person program.

One of the key benefits that the interview participant highlighted was personal optimism. The interviewee is an experienced teacher, but is also new to counseling and academic programming. The interview participant emphasized preference towards "openness to experimentation" and a willingness to learn by trying. In addition, the guidance counselor noted the importance of administrative support for STEM CCR. Both the current Principal of partner high school and the Superintendent of the district where the high school resides were school counselors and are "open to flexible learning situations." Moreover, both placed a great deal of trust in STEM CCR administrators that provided both an administrative stamp of approval and programmatic leeway to innovate.

In additional to administrative support, the interviewee notes parent enthusiasm for the program. While parents are not directly involved in STEM CCR, the interview participant states: "I think they just really like they opportunity that their student is going to be able to build these skills and go directly into a class that's going to count toward their college credits." The interviewee also notes that the direct path into college credit courses, versus remediation, is especially valuable in a lower income community where "financial barriers are huge." One measure is the fact that 40 percent of the students at the partner high school receive free or reduced lunch, according to the interview participant.

The dual credit program at the high school partner serves as the operational and diagnostic basis for developing STEM CCR. Prior to the STEM CCR program, the coordinator of the Open Learning Center at John Wood was already active at partner high school through scheduling of dual credit courses in college algebra and statistics. With the new grant funds, the interviewee notes that "things just happened perfectly" through the expansion of the partnership and the added aim of helping kids on the cusp of college math courses. All that as needed was "this program to bridge levels."

In curriculum design and alignment, the STEM CCR program corresponds to Basic Arithmetic and Pre-algebra (MAT 010) at John Wood. MAT 010 is the "remediation" course for Elementary and Intermediate Algebra (MAT 020) and Elementary Statistics (MAT 109). In short, instead of remediation courses in college, which are a "drain on time and money," STEM CCR helps to "take care of everything they need to kick off college running instead of taking preliminary classes."

Student diagnosis begins with the COMPASS test in their junior year. This is both a diagnostic for entrance into John Wood and a placement test for dual credit courses at

the partner high school. In launching the STEM CCR program, the guidance counselor at the partner high school added the dimension of intervention for students who fall just below readiness and who might benefit from the program. The interviewee estimates that 50% of students, twenty-six this past year, qualify for STEM CCR based on COMPASS (in a student body of about 230). However, this number decreases to ten or so based on student motivation as well as competing school activities. Actual enrollment for fall and spring was three students in each semester. Notably, the interview participant describes many of the participating students as those who are making a final push in order to "be done with math" once they satisfy their college requirement.

Student recruiting entails "close coordination between the partner high school and John Wood. The STEM CCR administrator at John Wood attends senior registration night during the summer and works closely with the interviewee to inform students and their parents and work out scheduling logistics. The STEM CCR program itself is designed as an independent work area, based on the John Wood Open Learning model. Students work every day and the interview participant is always present to provide individual and class instruction. The program entails a great deal of structure as well. The interview participant conducts a content assessment every other week in order to "keep students moving and on track." Regular intervals also, "helps boost their score and figure out where their mastery is." Thus, assessment is also meant as a student's self-diagnostic and a way to return to specific content areas. The interview participant also notes that student success at each assessment helps to build confidence as well, especially for those who suffer from "math phobias." The interviewee describes the program as a hybrid between high school and college settings. On the one hand, students follow a well-established and progressive path fitting of a high school environment. On the other hand, they learn to work independently and to manage their own course of study, akin to a college setting.

To assess "readiness" at the completion of the program, the partner high school uses a test designed by the John Wood math faculty. The interviewee administers the test using the online ALEKS program. A score of 83% is the benchmark for readiness.

As noted above, the interview participant brings to the program a particular continuity between instruction and support services. In general, support services are built into the high school. All seniors take part in an academic and career assessment to help them chart a course after high school. Given the more sustained involvement with STEM CCR students, students in the program receive "a bit more" support. This includes help

with resume building and job interviewing as well as college application and admissions help. Alternatively, students may work with another teacher on a scholarship essay and then come to the guidance counselor for further help in fine-tuning their work.

The interview participant notes that ongoing encouragement from the instructor is a vital ingredient in student success. Students are still developing a level of maturity and discipline and that, at times, fostering student motivation is "like pulling teeth." Taking student maturity and development into account is an important factor in achieving readiness. This means a proactive type of teaching: reminding students of their long-term goals, helping them to overcome "math phobias," and building confidence, all of which are part and parcel of readiness as content mastery. The interview participant notes the overall challenge of fitting all the necessary math content into a short time frame.

The interviewee also recognized limitations to this particular program model based on her own capacity in relation to the overall need. If, for example, student participation increased to twelve or more, classroom space and possible feelings of encroachment into regular math-class instruction would both raise a new set of challenges. The interview participant emphasized, however, that these are problems with solutions. In follow up correspondence with the interview participant, following the initial interview, a more basic problem presented itself. One week after the interview, the participant was informed that their position would become part-time next year due to state budget cuts. This reduction points to several scenarios in which the interview participant is no longer available to manage STEM CCR. While it is not certain that the interviewee will not be involved in STEM CCR next year, the perils of a successful one-person program become obvious.

The interview participant offered two broad observations about the STEM CCR program. First, STEM education usually envisions students who pursue science and technology careers. Accordingly, their college paths usually proceed by way of computer science or engineering, among others. The interviewee points out, however, that these college and career paths suggest that high school students are "already in trig or calculus" by senior year and have positioned themselves for a STEM field in college. By contrast, the high school partner is located in a small rural, agricultural town with one major employer. Accordingly, the college and career paths more often follow these lines. The interview participant also describes many of the participating students as still deciding or even just starting to ask the question of career.

At the same time, the interview participant sees a great deal of value and application of STEM in local jobs. As a next step, the interviewee envisions work place visits, and a new facet of the program that relates math to the kinds of work students would be doing in the community. In a more basic sense, the interview participant describes a more flexible educational concept that allows students to alternate between course work, internships, and apprenticeships in order to weave together a more extensive kind of readiness for both college and career.

The interview participant sums up the STEM CCR program as follows. In small town school environment, the approach is to "go above and beyond, even for 1 student." The goal is not to lose the program because it allows that student to "get what they need to be successful.

Perspectives from a High School Principal at a Partner School of Olney Central College in the Illinois Eastern Community College District

The context for the STEM CCR partnership between this partner high school and Olney Central College, of the Illinois Eastern Community Colleges district, is in a sense the Olney community itself. The interviewee explained that the overarching partnership between the high school and college is "well developed and longstanding," extending at least four decades. The interview participant also estimates that sixty to seventy percent of the graduates at this partner high school attend Olney Central after graduation, either in certificate or degree programs or in select classes.

In particular, when the STEM CCR administrator at Olney Central contacted the interview participant about STEM CCR, the specific program partnership made a great deal of sense. The STEM CCR administrator is a former board of education member for the high school and already knew the potential value of such a program at the partner high school. In addition, the partner high school and Olney Central already collaborate on a dual credit program, both transfer and CTE. This includes Olney Central/IECC involvement in COMPASS testing for partner high school students. Accordingly, the partnership capacity for a new program, i.e. STEM CCR, was already in place to focus on intervention and readiness, alongside dual credit and within a broad-based and longstanding partnership between the high school and community college (22.00).

In fact, the dual credit program served as a kind of operational launch pad for STEM CCR. High school and community college faculty were familiar with the kind of curriculum coordination required for STEM CCR. Accordingly, formal collaboration and coordination take place on a well-established routine. This includes a syllabus

review once each semester in order to "make sure that the curriculum guide and pacing guide is aligned with the syllabus we receive from OCC," and an annual evaluation of the program in order to take up larger academic and operational questions (see below). Moreover, high school and community college faculty share teaching responsibility, with two instructors from each leading STEM CCR courses.

In addition, the existing testing schedule supported diagnosis and recruiting of students for STEM CCR. Sophomore year, students are tested by the partner high school and Olney, using EPAS ACT, as a "readiness predictor" and also to determine dual credit eligibility junior year. Junior year, students are given the COMPASS test, again to determine readiness. The COMPASS test is used to identify students who are not on track to math readiness, and who might benefit from the academic intervention of STEM CCR.

The interview participant estimates that in a student body of 720, approximately thirty- to forty-percent of students would benefit from STEM CCR. In light of the overall student need, an ongoing challenge of the STEM CCR program has been fine-tuning the recruiting process. Recruiting students for the initial, summer bridge program included one on one meetings as well as outreach to parents. The interviewee notes that the more tailored recruiting process translated into more motivated and engaged students during summer session. In contrast, once the full academic year began, STEM CCR began mandatory. Like any other required course or activity, STEM CCR was "built into the students' schedule." While more students were involved, however, the program seemed to suffer. According to the interview participant, students saw STEM CCR as a "punishment" for academic performance, and many of the students were both "disengaged" and "disruptive." Accordingly, in the coming year, the high school partner will return to voluntary participation and a more intensive recruiting strategy with the aim of a better quality experience for students and higher success rate at the end of program.

The design of STEM CCR follows a progressive course. In the first semester, the focus is beginning algebra, and even basic math, in preparation for intermediate algebra second semester. The aim is to prepare students for college math the following summer and fall, in preparation for matriculation into Olney Central.

STEM CCR has benefited from a redesign of the overall school day at the high school partner. According to the interview participant, several years ago the high school moved from a four- to a five-block schedule, building in a forty-minute period at the

end of the day. This period is used in a number of ways, such as a homeroom advisory period. The fifth block was ready-made to accommodate STEM CCR. Math teachers were already involved in both ACT tutoring and Response to Intervention (RTI) during fifth period. Accordingly, the class schedule and current activities "fit very nicely with what we're trying to do with" STEM CCR. Math faculty participation was also made easy by the schedule. Some volunteered and in other cases, the Principal recruited qualified teachers. In each case, the teachers were well positioned to take on STEM CCR given the "flexibility of the setting" and "knowledge of the students." He notes that overall, teachers report a "very positive experience." Fifth block has also been ideal for academic- and career-related support services. For example, STEM CCR "weaves in Career Cruising" and is used to support and direct students toward college programs, both certificate and associates/transfer degrees.

Teaching in the STEM CCR program has not been without challenges, however. Because STEM CCR was required, and with a "level of apathy" among some students, keeping the students on track has been difficult at times — especially at the end of the school day. In addition, while the fifth block is a scheduling boon, it is also a challenge since the 40-minutes block — in contrast to 80-minute blocks for the other four periods — means an ongoing challenge of fitting content into a short amount of time. The former challenge is being addressed by a return to voluntary participation. In addition, next year fifth period will be extended fifteen minutes to provide more time for the necessary math content.

In addition to the main challenges of recruiting, time, and student motivation, which the high school partner continues to address as the program enters a new iteration in the fall, the interview participant expressed a more basic concern about the role of testing regimes on teaching and the overall school schedule. "Assessment" is "out of balance" with curriculum and instruction. As a result, it is often more "disruptive" than helpful in that it seems to "dominate" the course of the school year.

At the same time, the interview participant describes the kind of evidence that makes STEM CCR worthwhile, namely, student stories of success. Students come back to the high school partner after graduate to share their success stories, or, since Olney is a small community, the interviewee simply crosses paths with them out in the community. The interview participant describes a typically story as follows:

> I took beginning algebra in high school my senior year and then I went to OCC this summer and it took the intermediate algebra and now everything is moving forward," or, "now I'm finishing my associate's degree."

In short, the interviewee explains, the "number one successes [of STEM CCR] have been the opportunities we've provided to students." While it was beyond the means of the present evaluation, student interviews would be an illuminating part of the next STEM CCR evaluation. The interview participant offered to help identify and contact students for possible interviews.

In light of the solid partnership foundation, the fine-tuning of the program, and student successes, the Principal at the partner high school expressed a strong desire to continue STEM CCR. The question, however, is how to proceed once funding ends. "We hope to continue to be able to offer this opportunity to our students." And, "we have been really good over the years of finding a way to make things happen …" In the absence of continued funding, the interview participant believes that the partner high school and Olney Central can absorb some of the costs of STEM CCR. However, there are limits, especially around hard costs such as course and testing material. Without funding, these costs might need to be passed on to students, which raises a new set of problems around access and creates a new obstacle or disincentive to participate.

On the final question of STEM CCR redesign, the interviewee offered a basic criticism and solution. COMPASS readiness problematic in that it identifies students for intervention that may not need it and it overlooks students who made need it. In short, COMPASS is not always "a true measure of where a student is." The interview participant suggests an alternative, namely, a readiness assessment designed by the partner high school and community college. If the aim of readiness is specifically concerned with alignment between math courses at the high school partner and Olney Central, for example, then the diagnosis and readiness evaluation should flow directly from the same alignment.

In all, however, the Principal emphasized that STEM CCR supports the core belief and principle of the high school: "the idea of opportunity and that we want to be able to provide opportunities for students and really help them when they're leaving high school to be ready to move forward and to be successful at whatever they want to do." The interview participant concludes: "this partnership has been really good in that regard; it's allowed us to provide some really good opportunities for students."

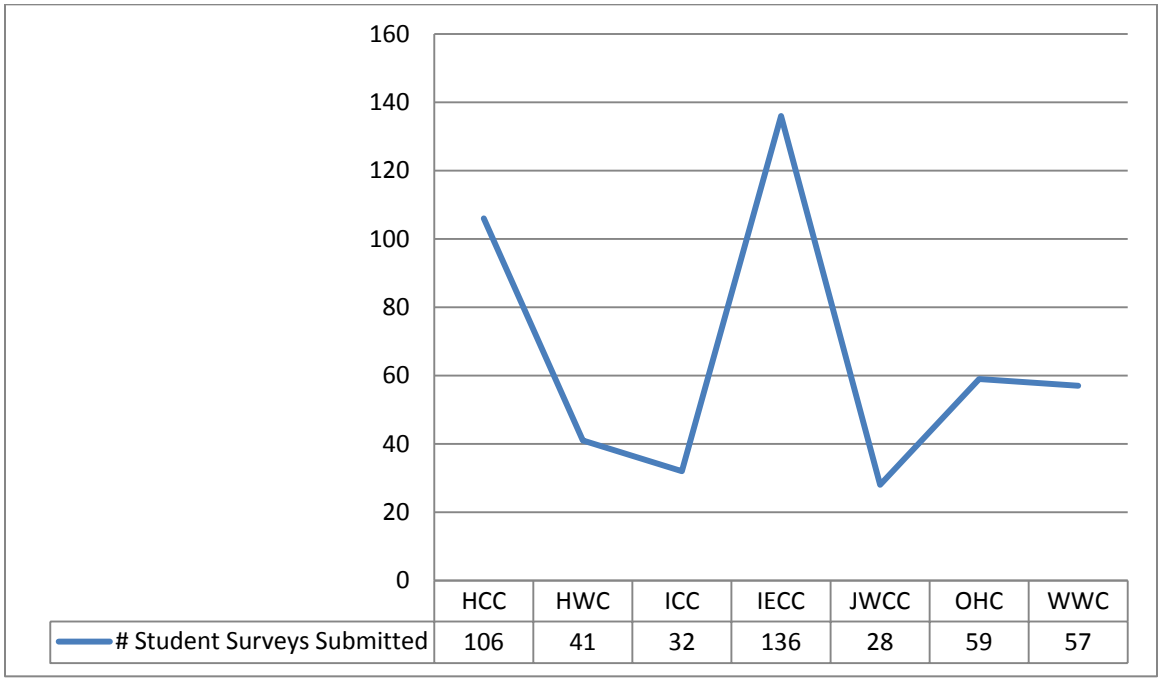
STEM CCR Student Perspectives

At the end of each term, following completion of the academic intervention, STEM CCR participants at each community college's partnering high school are asked to complete a student survey to assess their feelings about the instructors, whether they felt their academic skills have improved, their attitudes toward school, and educational plans for the future. While there roughly 600 students that have participated in STEM CCR since summer 2013. Table 3 illustrates STEM CCR student enrollment by semester and site across five academic terms while Table 4.

Table 3. STEM CCR Participants by Community College Site and Academic Term

Site	Summer 2013	Fall 2013	Spring 2014	Summer 2014	Fall 2014	Total Records
HWC	7	49	49	57	57	219
OHC	N/A	25	52	57	85	219
WWC	25	55	59	79	79	297
ICC	N/A	N/A	16	18	46	80
IECC	12	37	66	87	131	333
JWCC	11	20	25	30	33	119
HCC	13	17	66	71	165	332
Total	68	203	333	399	596	1,599

Figure 2. Completed STEM CCR Student Surveys Submitted Following Academic Intervention

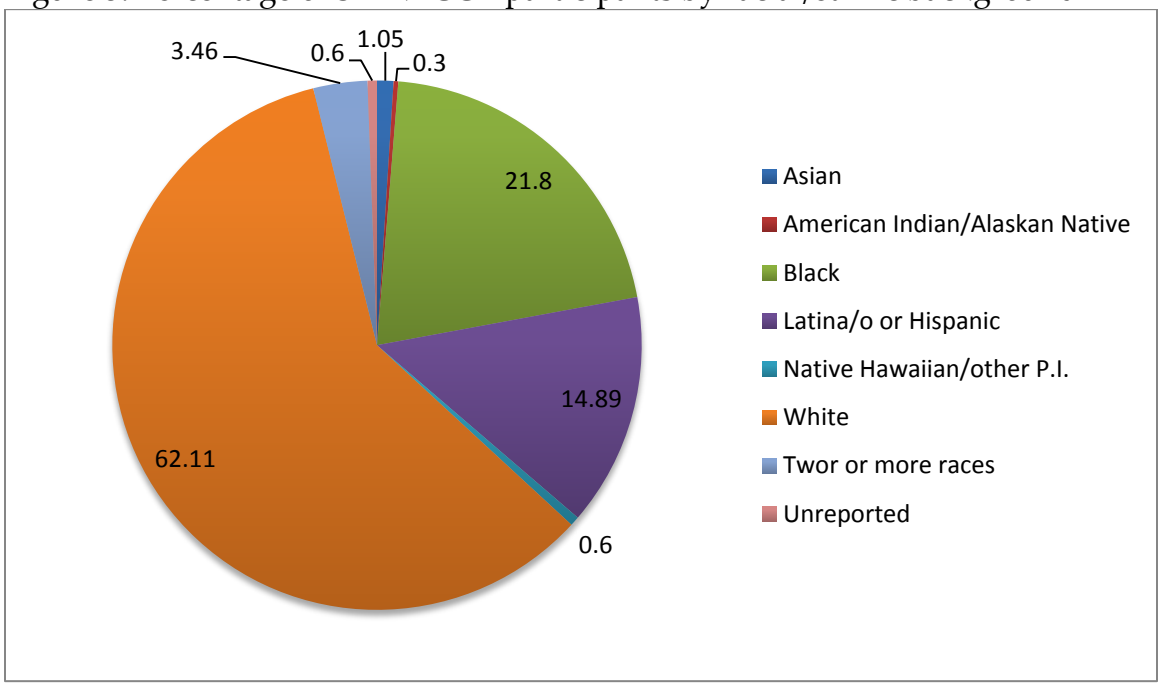


Note: Harold Washington College (HWC); Olive Harvey College (OHC); Wilbur Wright College (WWC); Illinois Central College (ICC); Illinois Eastern Community College (IECC); John Wood Community College (JWCC) and Heartland Community College (HCC)

More specifically, the student surveys were designed to capture student experiences upon completion of each term. Questions were structured to examine student academic self-efficacy and college readiness as a result of participating in the STEM CCR programs. It should be noted that the survey underwent minor changes since first administered in summer of 2013.

Initially a survey link was created for each term (e.g., summer 2013 had a distinct survey whereby students did not enter information regarding the term of participation). Later the survey was updated to include a question that allowed students to select their term of participation. As a result, this eliminated the need for producing multiple survey links every term and permitted sites to consistently use one survey link for the remainder of their participation in the grant. Survey links are provided to STEM CCR community college site leaders who share the information with partnering schools and coordinate administration of the surveys at the end of the term, upon completion of the academic intervention. Typically, surveys are administered by college personnel during summer bridge programs and by high school faculty during fall and spring terms.

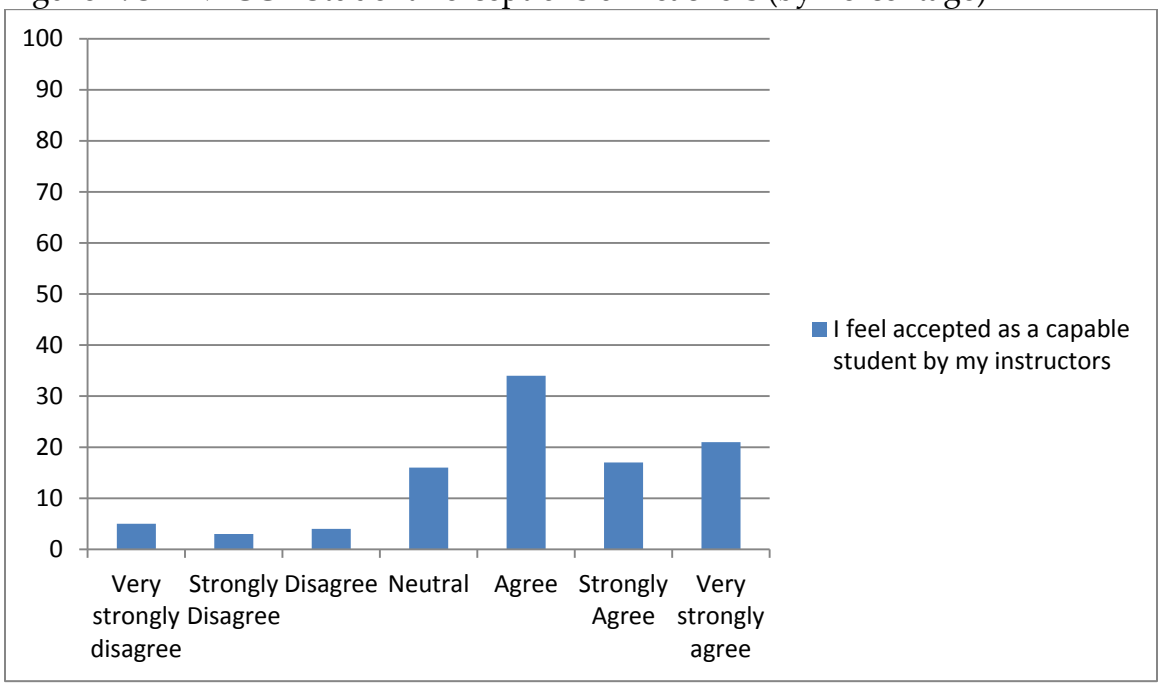
Figure 3. Percentage of STEM CCR participants by racial/ethnic background



Data on race/ethnicity, gender, and grade level are collected from intake forms submitted to the OCCRL by each of the seven sites. These are self-reported data in which students complete the intake form at the time of participation. Those forms are then uploaded to an electronic database created at the OCCRL.

The student survey consists of seven parts. The first of which contains questions regarding learning experiences (i.e., items 5-18). The learning experiences domain of the student survey largely focus on classroom climate and the extent to which instructors engage and validate students in the classroom. The section begins with the prompt, "When I think about my STEM CCR class and instructor…" and students respond with their level of agreement on a scale of one to even, one being very strongly disagree and seven being very strongly agree. Overall student responses were positive, with the average scores being above a five or "agree." Question 12 received an average score of less than five, at 4.7. The item asks students if they are encouraged by instructors to openly share their views in class.

Figure 4. STEM CCR Student Perceptions of Teachers (by Percentage)



Questions 19 through 28 of the survey cover learning outcomes. The learning outcomes domain of the student survey assess students' perception of their own improvement in academic skills as a result of participating in the program. Improved academic self-efficacy as a result of STEM CCR participation. Students were prompted with, "As a result of the STEM CCR Program…" and asked to respond to a series of items based on a 7-point Likert scale from very strongly disagree to very strongly agree. Students largely agreed that STEM CCR participation improved skillsets. See Figure 7 for student perceptions of math skill improvement following participation in STEM CCR academic interventions.

Figure 5. I feel motivated to come to my classes

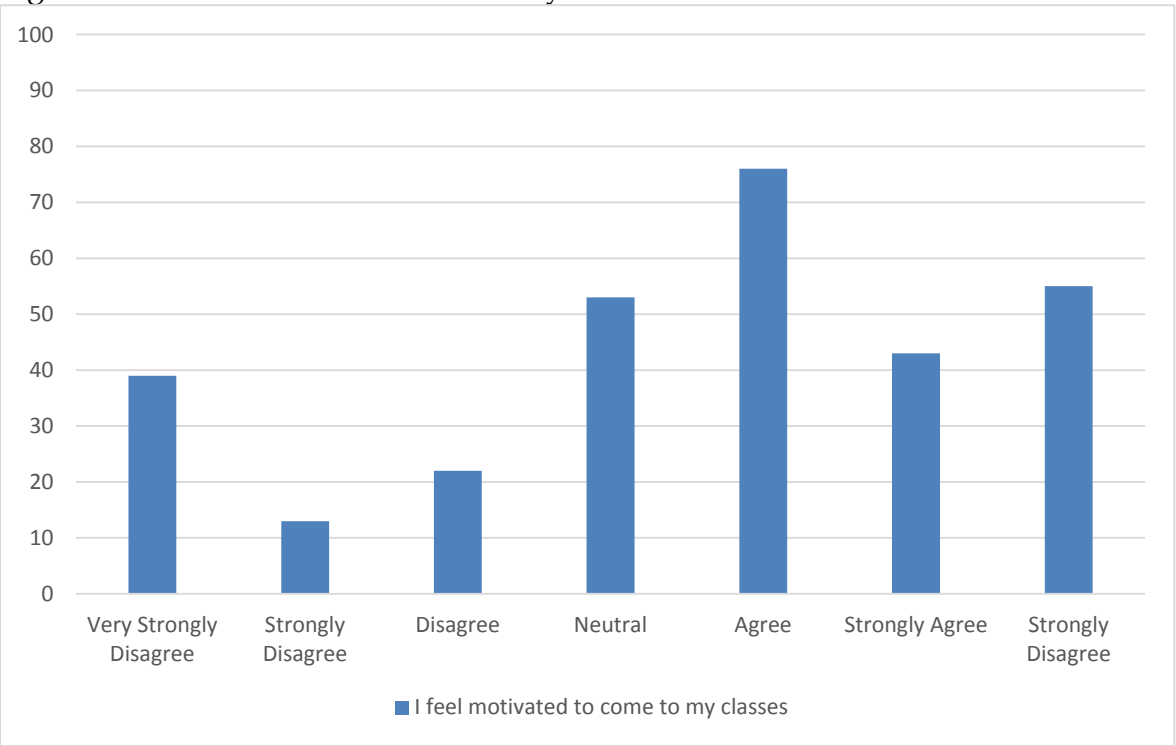
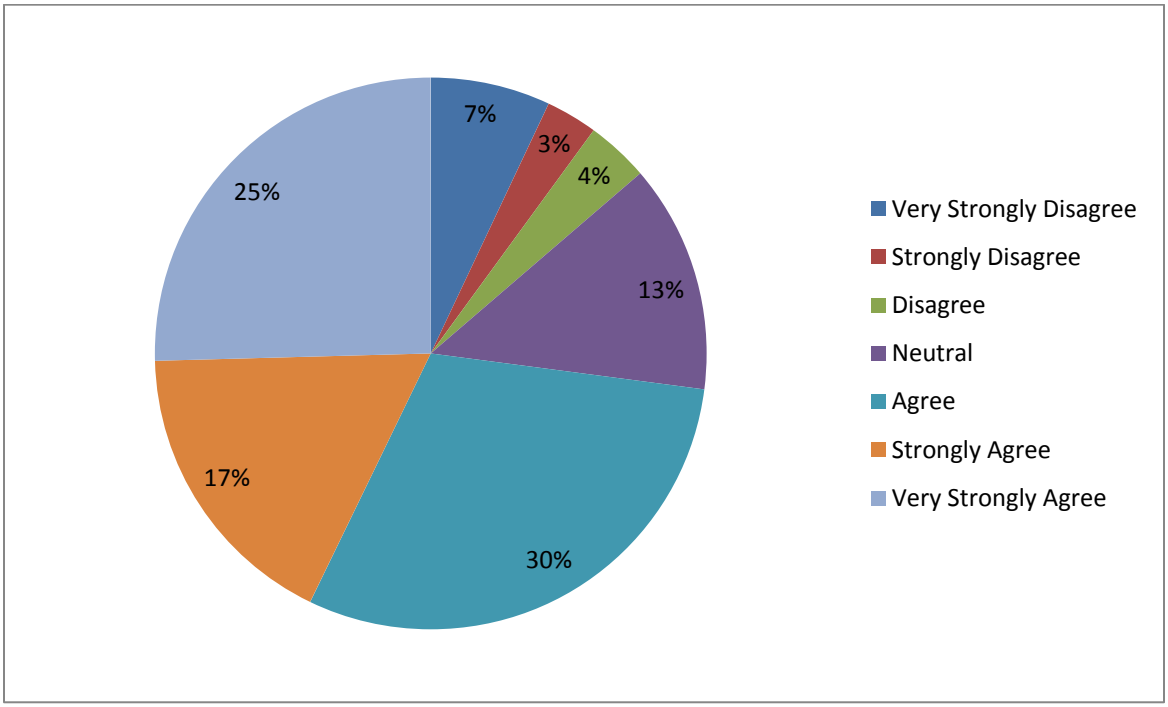
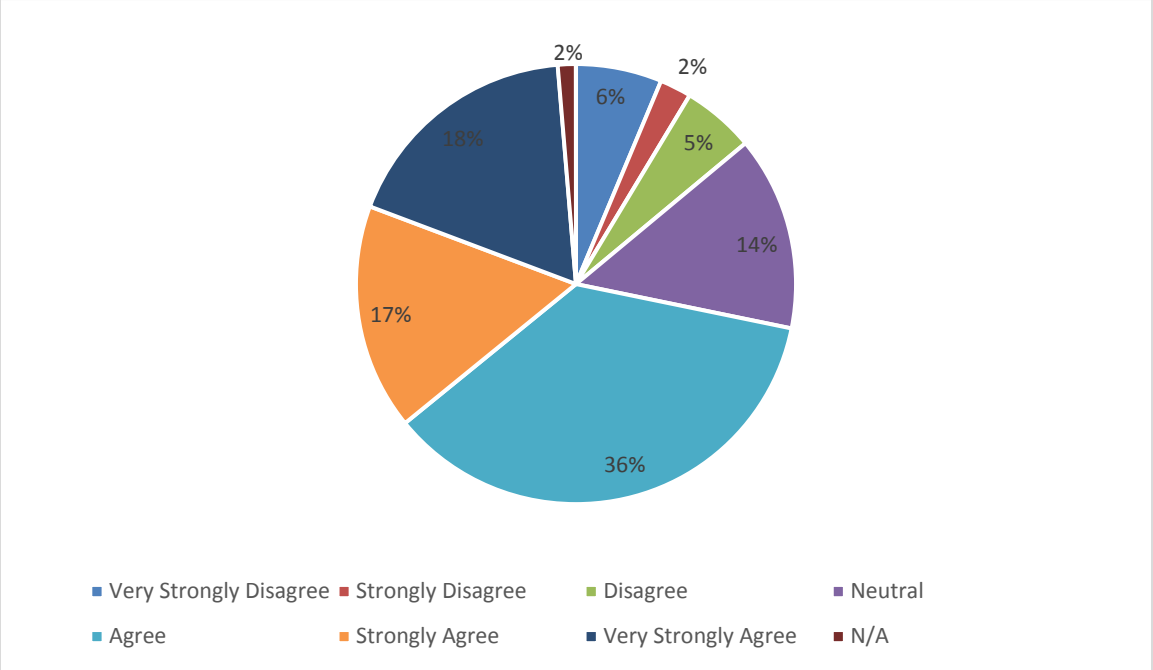


Figure 6. My instructors are willing to take as long as needed to help me understand the class material.



Items gauged to capture students' understanding of navigating through courses, the college application process, and expectations of college attendance were captured in questions 29-43. In particular, this series of questions of the student survey assess students' college readiness with respect to the college knowledge area of Conley's college and career readiness model. In short, this domain measured student's perception of improved knowledge of college going as a result of participating in the STEM CCR program. For instance, nearly ¾ of participants felt they understood college requirements while little over 60% of students reported understanding the financial aid process and the support services available at colleges a result of their participation in the program.

Figure 7. I have improved my math skills.



Questions 44-76 dealt with college and career planning and readiness, while the last portion of the survey asked students when they first received advice from their school on the proper courses to take to gain admittance to college and who in their lives encouraged college attendance, contained background/demographic questions and open-ended questions. Close to 12% of students indicated that a certificate is the highest educational credential they intend to receive while 30% desire an associate's degree, 24% want to earn a bachelor's, 8.5 percent intend to obtain master's degrees, 4% a Ph.D. or professional doctorate, 1% would aspire an M.D., D.O., D.D.S, or other health related doctorate and 4% want to earn other doctorates as their highest educational degree.

A Pearson product-moment correlation coefficient was computed to assess the relationship between student motivation, teacher's perception of students' ability to do the class work, skills gained to succeed in college-level courses, GPA, educational aspirations and educational plans after finishing high school with perceived improvement in math.

There was a strong correlation between "I feel motivated to come to my classes" and "I have improved my math skills ($r = .609$, $n = 457$, $p = .000$). Teacher's perception of students' ability to do the class work was positively correlated with perceived math improvement ($r = .625$, $n = 454$, $p = .000$) as well as feeling that one has gained skills necessary to succeed in college-level courses ($r = .630$, $n = 456$, $p = .000$). While there was no relationship between highest educational aspiration ($r = .032$, $n = 457$, $p = .492$) or educational plans after finishing high school with perceived improvement in math ($r = -.020$, $n = 456$, $p = .674$), there was a weak negative correlation between self-reported GPA and improving in math. In other words, there was a decreasing tendency for perceiving math improvement among STEM CCR participants the higher the reported GPA ($r = -.140$, $n = 458$, $p = .003$). Finally, there was a weak negative, marginal relationship between race and perceived improvement in math skills ($r = -.105$, $n = 299$, $p = .071$).

There were statistically significant differences between group means by community college sites supporting STEM CCR programs on perceived math skills improvement as determined by one-way ANOVA [$F(6, 451)=4.188$, $p =.000$]. While there was an overall difference between sites, the Games-Howell post hoc test, which assumes unequal variances, was conducted to confirm which specific groups of students differed on perceived math improvement by site (See Appendix for Post-Hoc Comparisons).

Table 4. ANOVA Between and Within Group Mean Differences on Student Perceived Math Skills Improvement by Community College Partner Sites

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	59.043	6	9.841	4.188	.000
Within Groups	1059.675	451	2.350		
Total	1118.718	457			

A logistic regression was performed to ascertain the effects of student motivation, skills gained to succeed in college-level courses, highest educational degree aspirations, and GPA on the likelihood of perceived math improvement among STEM CCR participants. The logistic regression model was statistically significant, $\chi^2(4) = 16.481$, $p < .036$. The model explained 63.8% (Nagelkerke R^2) of the variance in perceived math skill improvement and correctly classified 93.9% of cases. Students highly motivated to attend STEM CCR classes were roughly 1.5 times more likely to perceive improvement in their math skills. The more students felt their STEM CCR instructors believed in their ability to do the class work was associated with greater odds (i.e., 1.6x's higher) of improved math skills. The more STEM CCR students felt they gained skills necessary to succeed in college-level courses, they were 2.9 times more likely of perceiving math skill improvement; but increasing GPA showed a reduction in the likelihood of perceived improvement in math skills.

Table 5. Logistic Regression Analysis for Variables Predicting Perceived Improvement in Math Skills of STEM CCR Participants Completing Academic Intervention (n = 459), Controlling for background variables

	B	S.E.	Wald	df	Sig.	Exp(B)
Motivated to come to my classes	.370	.171	4.663	1	.031*	1.448
My instructors show that they believe in my ability to do the class work	.519	.192	7.310	1	.007*	1.680
I have gained the skills to succeed in college-level courses	1.064	.224	22.549	1	.000**	2.898
Highest educational degree you intend to obtain	.019	.117	.026	1	.871	1.019
Estimated H.S. GPA	-.022	.137	.023	1	.879	.979
Constant	-6.214	1.467	17.929	1	.000	.002

Note: Controls race/ethnicity, gender, parent's income, and mother/father's highest level of education (omitted from the table).
*p<.05, **p<.001

Conclusion

Overall, student experiences in STEM CCR programs have been found to be helpful in improving math skills, setting/expanding expectations for college planning (e.g., study skills, the college application process, potential program majors/careers). However, students also have faced barriers as STEM CCR programs have been implemented from structural barriers, to intrapersonal challenges, pace of courses, and new (advanced) math content.

Community College and High School Stakeholders have also noted the value added, opportunities and challenges with implementation of STEM CCR. There have been refinements from year 1 planning to year 2 implementation that are still being tweaked in this final and third year of the grant. A continuing aspect of this project that harkens back to the prior CCR pilot programs is the inconsistency in CCR program implementation. For example, each of the seven colleges employ differ cut-scores for readiness, use different means of recruiting student participants (e.g., some sites utilize ACT Plan scores while others do not).

In closing, comparative evaluation of student participation and outcomes across the seven sites and their partnering high schools bears fragility given instances of staff turnover, missing data, and curriculum alignment meetings that were not full actualized until spring 2015. Whether COMPASS or ACCUPLACER are ideal as pre- and post-test measures is still up for debate (see Belfield & Crosta's 2012 study found placement tests are not strong predictors of how students will perform in college). Nonetheless, the overall success shines through in the voices of the students that are academically engaged and feel they are advancing toward their goals to be college bound and college ready. These participants demonstrate the state's general aim to have Illinois high school graduates prepared to enter college-level courses, to be successful in school, in work, and in life. As one STEM CCR participant noted, "I feel ready for college. The STEM CCR summer bridge has helped me realize what the college life was like. I had an idea but I wasn't really sure on what it was really like. I feel more than ready because now I know what to look forward to when I graduate from high school."

References

Baber, L. D., Barrientos, J. I., Bragg, D. D., Castro, E. L., & Khan, S. (2009). *The Illinois College and Career Readiness Act: Year-one evaluation results*. Champaign, IL: Office of Community College Research and Leadership, University of Illinois at Urbana-Champaign.

Baber, L. D., Castro, E. L., & Bragg, D. D. (2010). *Measuring success: David Conley's college readiness framework and the Illinois College and Career Readiness Act*. Champaign, IL: Office of Community College Research and Leadership, University of Illinois at Urbana-Champaign.

Baber, L. D., Graham, E., Reese, G. C., Taylor, J. L. & Bragg, D. D. (2014, July). *STEM college and career readiness report: 2013-2014*. Champaign, IL: Office of Community College Research and Leadership, University of Illinois at Urbana-Champaign.

Baber, L., Graham, E., Taylor, J. L., Reese, G., Bragg, D. D., Lang, J., & Zamani-Gallaher, E. M. (2015, February). *Illinois STEM college and career readiness: Forging a pathway to postsecondary education by curbing math remediation*. Champaign, IL: Office of Community College Research and Leadership, University of Illinois at Urbana-Champaign.

Belfield, C., & Crosta, P. (2012, February). *Predicting success in college: The importance of placement tests and high school transcripts*. Working Paper 42. New York: Community College Research Center, Teachers College, Columbia University.

Berger, N., & Fisher, P. (2013). A well-educated workforce is key to state prosperity. *Economic Analysis and Research Network Report*, *22*. Retrieved from http://www.policymattersohio.org/wp-content/uploads/2013/08/EducationProsperity.pdf

Bettinger, E., Boatman, A., & Long, B. T. (2013, Spring). Student supports: Developmental education and other academic programs. In C. Rouse, L. Barrow, & T. Brock (Eds.), *Future of children: Postsecondary education in the U.S.*, *23*(1), 93-115.

Bragg, D. D., Baber, L. D., & Castro, E. L. (2011). *Illinois' College and Career Readiness pilot initiative: Progress on implementation of Conley's comprehensive model*. Champaign, IL: Institute of Government & Public Affairs.

Bragg, D. D., Baber, L. D., Cullen, D. P., Reese, G., & Linick, M. (2011). *Evaluation of Illinois College and Career Readiness Act pilot projects year four (2010-11): Summary report*. Champaign, IL: Office of Community College Research and Leadership, University of Illinois at Urbana-Champaign.

Bragg, D., Loeb, J., Yoo, J., & Zamani-Gallaher, E. M. (2007). *Ready or not here they come! College readiness among tech prep participants and non-participants in four disparate locations*. Unpublished paper. Office of Community College Research and Leadership, University of Illinois at Urbana-Champaign.

Breneman, D. W., & Haarlow, W. N. (1998). Remediation in higher education. A symposium featuring remedial education: Costs and consequences. *Fordham Report*, *2*(9), 9. Retrieved from http://files.eric.ed.gov/fulltext/ED422770.pdf

Bureau of Labor Statistics (2013, December). *Occupational employment projections to 2022.* Monthly Labor Review. Retrieved from http://www.bls.gov/opub/mlr/2013/article/occupational-employment-projections-to-2022.htm

Carnevale, A. P., Rose, S. J., & Hanson, A. R. (2012). *Certificates: Gateway to gainful employment and college degrees*. Washington, DC: Georgetown University Center on Education and the Workforce.

Castro, E. L., Bragg, D. D., Khan, S., Baber, L. D., & Common, B. (2010). *How Illinois' College and Career Readiness (CCR) pilot sites addresses five key goals*. Champaign, IL: Office of Community College Research and Leadership, University of Illinois at Urbana-Champaign.

Common Core State Standards Initiative (2015). *Standards in your state*. Retrieved from http://www.corestandards.org/standards-in-your-state/

Complete College America (2012). *Remediation: Higher education's bridge to nowhere*. Complete College America, Washington, DC.

Conley, D. T. (2005). *College knowledge: What it really takes for students to succeed and what we can do to get them ready.* San Francisco: Jossey-Bass.

Conley, D. T. (2007). *Redefining college readiness*. Eugene, OR: Educational Policy Improvement Center. Retrieved from http://files.eric.ed.gov/fulltext/ED539251.pdf

Darling-Hammond, L., Wilhoit, G., & Pittenger, L. (2014). Accountability for college and career readiness: Developing a new paradigm. *Education Policy Analysis Archives*, *22*(86), 1-33.

Jacob, B. A., & Lefgren, L. (2004). Remedial education and student achievement: A regression-discontinuity analysis. *Review of economics and statistics*, *86*(1), 226-244.

Khan, S., Baber, L. D., Bragg, D. D., Castro, E., Sanders, C., & Common, B. (2009, December). *Year-two evaluation of the Illinois College and Career Readiness Act pilot sites*. Champaign, IL: Office of Community College Research and Leadership, University of Illinois at Urbana-Champaign.

Linick, M. A., Taylor, J. L., Reese, G. C., Bragg, D. D., & Baber, L. D. (2012). *Illinois' college and career readiness academic intervention results for 2011-2012*. Champaign, IL: Office of Community College Research and Leadership, University of Illinois at Urbana-Champaign.

Long, B. T. (2014). Proposal 6: Addressing the Academic Barriers to Higher Education. *Policies to Address Poverty in America*, 67. Retrieved from http://www.brookings.edu/~/media/Research/Files/Papers/2014/06/19_hamilton_policies_addressing_poverty/policies_address_poverty_in_america_full_book.pdf#page=69

Martorell, P., & McFarlin Jr, I. (2011). Help or hindrance? The effects of college remediation on academic and labor market outcomes. *The Review of Economics and Statistics*, *93*(2), 436-454.

Maryland Higher Education Commission (1996). *A study of remedial education at Maryland public campuses.* Annapolis: Maryland Higher Education Commission.

Mattern, K., Burrus, J., Camara, W., O'Connor, R., Hanson, M. A., Gambrell, J., Casillas, A. & Bobek, B. (2014). *Broadening the Definition of College and Career Readiness: A Holistic Approach*. ACT Research Report Series 2014-5. Iowa City, IA: ACT.

Merisotis, J. P., & Phipps, R. A. (2000). Remedial education in colleges and universities: What's really going on? *The Review of Higher Education*, *24*(1), 67-85.

Mettler, S. (2014). *Degrees of inequality: How the politics of higher education sabotaged the American dream*. New York: Basic Books.

Mishel, L., Bivens, J., Gould, E., & Shierholz, H. (2012). *The state of working America, 12th edition*. Ithaca, NY: Cornell University Press.

PL 095-0694, Section 5 of the Public Community College Act, Sec. 2.24, College and Career Readiness Pilot Program (2007).

Royster, P., Gross, J., & Hochbein, C. (2015). Timing is everything: Getting students back on track to college readiness in high school. *The High School Journal*, *98*(3), 208-225.

Smith, A. A. (2015, June 25). Florida's remedial law leads to decreasing pass rates in math and English. *Inside Higher Ed*. Retrieved from https://www.insidehighered.com/news/2015/06/25/floridas-remedial-law-leads-decreasing-pass-rates-math-and-english

Taylor, J. L., Linick, M. A., Reese, G. C., Baber, L. D., & Bragg, D. D. (2012). *Illinois college and career readiness implementation evaluation: Year-five (2011-2012) results*. Champaign, IL: Office of Community College Research and Leadership, University of Illinois at Urbana-Champaign.

Tierney, W. G., & Sablan, J. R. (2014). Examining college readiness. *American Behavioral Scientist*, *58*(8), 943-946.

Appendix: Supporting Documents

As outlined by grant requirements each of the seven sites are to hold two types of intervention. One intervention is in the form of a summer bridge program held on the college campuses for at least four weeks during the summer. The other is much longer intervention held in the high schools. COMPASS has been selected as the testing mechanism for pre and post-test placement.

Completion is defined as student persisting until the last week of the intervention and completing the final exam and/or post-test. Whereas ICCB provides a foundation for sites as they implement CCR programming, there is some variation across sites with respect to COMPASS cut off scores and determinants of program completion.

It is worth noting, many of the sites have undergone administrative changes since the beginning of the STEM CCR grants in summer of 2013. All but one site have experienced these changes, which has implications for how programs are implemented across the sites. As new leaders come on board, continuity of programming and understanding of the context may be lost in the transition, and on occasion halt the progress of the programs to some extent.

Heartland Community College

Leadership: Jeremy McClure, Instructional Math Chair of Mathematics

Outcomes: As noted in the chart below, Heartland has 59 reported student outcomes between summer 2013 term and spring 2014. Again, outcomes are based on the number of students with both a pre and post-test during a given term. Due to the structure of Heartland's developmental math course sequencing, we were unable to ascertain student level gains.

- **Name of Intervention:** Changing the Equation
- **Academic content offered:** Math 091 (Pre-Algebra); Math 092 (Elementary Algebra); Math 093 (Level 1 Intermediate Algebra); Math 094 (Level 2 Intermediate Algebra)
- **Intervention description:** Heartland offers interventions in two ways, before and after school. The Bloomington High School intervention is held completely after school and the Normal Community & Normal Community West Interventions offer during and after school interventions. Instruction includes lecture and computer based learning.

- **Criteria for completing intervention:** Participation; pre-post test scores; quizzes, assignments.

Harold Washington College

Leadership: Kim Bowens, Early College Coordinator

Outcomes: Harold Washington has outcomes for seven students. It should be noted that of the seven students that participated during that term, four actually consented to participation so reporting of level gains will be based on those numbers. Of the four, only three reported pre and post-test COMPASS scores. Each of the three students tested into to Math 099: Intermediate Algebra w/ Geometry. One of the students reported testing into college level math and the other two reported no change in placement.

- **Name of Intervention:** M2APs
- **Academic content offered:** Math 099 (Intermediate Algebra w/ Geometry)
- **Intervention description:** Harold Washington offered the intervention during a fifth hour block at their two partner high schools. The college instructor provides instruction on days of intervention with the high school and college faculty working to align content.
- **Criteria for completing intervention**: Participation; pre-post test scores.

Illinois Central College

Illinois Central experienced challenges early on and did not implement a full program until the summer of 2014.

Leadership: Judy Dietrich

- **Name of Intervention:** Summer Bridge
- **Each Intervention offered:** Pre-Algebra; Intermediate Algebra; Geometry
- **Intervention description:** Illinois Central also uses ALEKs software as primary instructional method for students. Students are provided with in class assistance when needed as they work through the software which adapts to their skill level.
- **Criteria for completing intervention:** Participation; pre/post-tests; Software assessments (ALEKS)

Illinois Eastern Community College

Leadership: Jervaise McDaniel, Associate Dean of Outreach; Katie Fehrenbacher, STEM CCR grant coordinator; Leslie Shan, STEM CCR grant coordinator

Outcomes: For the summer 2013 term, six students tested into one level below college level, five tested in to two below college level, and one tested in to college level math. No student reported any gains –positively or negatively
Fall 2013 – three students tested two levels below college level math. Of those three, one improved their scores to one level below college level math. Seven students tested into one level below college level math and of those seven, four tested in to college level math during post-tests. Additionally, seven students tested in to college level math to begin with of those seven, two actually post tested in to the level of math just below college level.

- **Name of Intervention:** STEM College and Career Readiness
- **Academic content offered:** Beginning & Intermediate Algebra
- **Intervention description:** Illinois Eastern offers the intervention during Richland's fifth hour block, which was designated for the purposes of college and career readiness. The intervention uses IECC's syllabus for
- **Criteria for completing intervention:** Course attendance, tests/quizzes, pre/post-tests, Assessments via software programs (e.g., ALEKS).

John Wood Community College

Leadership: Andrea Allen, Assistant Director of STEM CCR

Outcomes: Summer 2013 – Three students tested one level below and seven tested two levels below college level math. Six students made improvements during this term, four of which placed into one level above college level math, and two placing into college level math (one that went from two levels below to college level math). Through Spring 2015, David Shinn led the program at John Wood.

- **Name of Intervention:** JWCC STEM CCR
- **Academic content offered:** Math 010 (Pre-Algebra)
- **Intervention description:** John Wood offered a during the day program using ALEKS software and providing supplemental instruction as needed. After school, assistance is provided at times if students need extra help.

- **Criteria for completing intervention:** Program participation; Assessments via software programs (e.g., ALEKS).

Olive Harvey

Leadership: Sudipta Roy, Math Faculty

- **Name of Intervention:** Race to the Top
- **Academic content offered:** Intermediate Algebra; Algebra; Geometry
- **Intervention description:** Olive Harvey provided to types of interventions. One intervention was provided after school at Julian and the other was provided during the day at Corliss (Pre-Cal**)**. The after school program resembled more of a tutoring program to bring students up to college level math and the intervention held during the day integrated college instruction into an existing Algebra-Trig class.
- **Criteria for completing intervention:** Participation; Completion of course assessments.

Wilbur Wright

Leadership: Bonnie Kang, Dean of College to Careers

Outcomes: Summer 2013 – Nine students tested two levels below, eight tested one level below, and one tested in to college level math during the pre-tests. Four students improved their scores well enough to move to the next level. Two of which went from two levels below to placing in to college level math. One student actually placed lower in the post-test than in the pretest, initially placing one level below.

- **Name of Intervention:** MathWays
- **Academic content offered:** Math 098 & Math 099; Algebra; Intermediate Algebra; Geometry
- **Intervention description:** Wilbur Wright's spring 2014 intervention was held for two hours after school. The instruction has focused on problem-based learning, with some lecture and computerized based learning.
- **Criteria for completing intervention:** Participation; Assessment via software programs (e.g., ALEKS); pre/posttest.

Table 6. Post-hoc Multiple Comparisons: Games-Howell
Dependent Variable: I have improved my math skills

(I) The community college that supports your STEM College and Career Readiness program.	(J) The community college that supports your STEM College and Career Readiness program.	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Harold Washington College	Heartland Community College	-.127	.292	.999	-1.02	.77
	Illinois Central College	.769	.428	.555	-.53	2.07
	Illinois Eastern Community College - Olney	.359	.308	.904	-.58	1.29
	Olive Harvey College	-.384	.320	.891	-1.35	.58
	John Wood Community College	-.325	.368	.974	-1.44	.79
	Wilbur Wright College	-.404	.304	.835	-1.33	.52
Heartland Community College	Harold Washington College	.127	.292	.999	-.77	1.02
	Illinois Central College	.896	.357	.184	-.21	2.00
	Illinois Eastern Community College - Olney	.486	.198	.181	-.10	1.07
	Olive Harvey College	-.257	.216	.896	-.91	.39
	John Wood Community College	-.198	.282	.992	-1.07	.68
	Wilbur Wright College	-.277	.192	.777	-.85	.30
Illinois Central College	Harold Washington College	-.769	.428	.555	-2.07	.53
	Heartland Community College	-.896	.357	.184	-2.00	.21
	Illinois Eastern Community College - Olney	-.410	.370	.922	-1.55	.73
	Olive Harvey College	-1.153	.380	.055	-2.32	.01
	John Wood Community College	-1.094	.421	.147	-2.38	.19
	Wilbur Wright College	-1.173*	.367	.038	-2.31	-.04
Illinois Eastern Community College - Olney	Harold Washington College	-.359	.308	.904	-1.29	.58
	Heartland Community College	-.486	.198	.181	-1.07	.10
	Illinois Central College	.410	.370	.922	-.73	1.55
	Olive Harvey College	-.743*	.236	.033	-1.45	-.04
	John Wood Community College	-.684	.298	.268	-1.60	.23
	Wilbur Wright College	-.763*	.215	.009	-1.40	-.12
Olive Harvey College	Harold Washington College	.384	.320	.891	-.58	1.35
	Heartland Community College	.257	.216	.896	-.39	.91
	Illinois Central College	1.153	.380	.055	-.01	2.32
	Illinois Eastern Community College - Olney	.743*	.236	.033	.04	1.45
	John Wood Community College	.059	.311	1.000	-.89	1.01
	Wilbur Wright College	-.020	.232	1.000	-.72	.68
John Wood Community College	Harold Washington College	.325	.368	.974	-.79	1.44
	Heartland Community College	.198	.282	.992	-.68	1.07
	Illinois Central College	1.094	.421	.147	-.19	2.38
	Illinois Eastern Community College - Olney	.684	.298	.268	-.23	1.60
	Olive Harvey College	-.059	.311	1.000	-1.01	.89
	Wilbur Wright College	-.079	.294	1.000	-.99	.83
Wilbur Wright College	Harold Washington College	.404	.304	.835	-.52	1.33
	Heartland Community College	.277	.192	.777	-.30	.85
	Illinois Central College	1.173*	.367	.038	.04	2.31
	Illinois Eastern Community College - Olney	.763*	.215	.009	.12	1.40
	Olive Harvey College	.020	.232	1.000	-.68	.72
	John Wood Community College	.079	.294	1.000	-.83	.99

*. The mean difference is significant at the 0.05 level.