BUILDING ASSETS REDUCING RISKS

The Building Assets-Reducing Risks Program: Replication and Expansion of an Effective Strategy to Turn Around Low-Achieving Schools

i3 Development Grant

Final Report

October 2015

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Executive Summary

BUILDING ASSETS REDUCING RISKS

Final Report

This report presents the final results of the U.S. Department of Education Investing in Innovation (i3) grant, *The Building Assets-Reducing Risks Model: Replication and Expansion of an Effective Strategy to Turn Around Low-Achieving Schools.*

The Building Assets Reducing Risks (BARR) Model BARR is a comprehensive model that addresses the challenges that are part of the 9th grade transition year through the implementation of eight different school-wide and individual strategies. It combines teachers' real-time analysis of student data, student asset building, and intensive teacher collaboration to prevent course failure. It reaches all students and teachers, and uses SEL skills to help increase academic performance. It develops positive student-teacher relationships and integrates student supports into a school's existing model for addressing non-academic barriers to learning.

BARR has been implemented at St Louis Park High School, MN since school year 1998 – 1999. It was initially funded through a Minnesota Department of Human Services State Incentive Grant. In 2009, SAMHSA's National Registry of Evidence-based Programs and Practices (NREPP) listed the BARR program in its registry, and has recently been recognized in the CASEL Guide for Effective Social and Emotional Learning Programs. In 2010, BARR received an Investing in Innovation (i3) Development grant from the US Department of Education to replicate and expand BARR to other high schools and conduct a randomized controlled trial to test its effectiveness. This report details the final results of the i3 Development grant.

A large suburban high school in southern California participated in a within-school Randomized Controlled Trial (RCT) of the BARR Model. A total of 555 9th grade students were randomly assigned to BARR and non-BARR conditions. At the end of the RCT year, BARR students had earned significantly more core course credits, higher grade point averages, and had a lower course failure rate than non-BARR students. BARR students also earned

significantly higher standardized test scores on the Northwest Education Association's (NWEA) Measures of Academic Progress (MAP) scores in mathematics and reading than did non-BARR students after one year of implementation; specifically an average of two years of growth in mathematics, compared to one year of decline in the non-BARR condition. In addition, students in the BARR condition who were identified as having lower academic proficiency earned significantly more core course credits and achieved higher NWEA scores in mathematics and reading than did their counterparts in the non-BARR condition. Students identified as more academically proficient earned significantly higher NWEA scores in mathematics than did their counterparts in the non-BARR condition.

In the second and third years of the grant, BARR was implemented in the entire 9th grade, and the core course failure rate continued to decline. In addition, the achievement gap between Hispanic and non-Hispanic students closed by year two of implementation and remained closed in year three. Implementation fidelity of the BARR model was achieved in year one, and continued to improve over the second and third years of the study.

BARR was also implemented in two rural high schools in Maine. One high school implemented BARR with fidelity and saw decreases in core course failure rate, increases in grade point averages, and increases in standardized test scores in reading, language, and mathematics during the three years of BARR implementation. The other high school did not achieve fidelity in the quality of implementation, and there were no significant decreases in failure rate nor consistent increases in standardized test scores over the three years.

BARR teachers reported improved relationships with students, increased ability to perceive student strengths, use of data to improve student performance, better communication with administration, less isolation, and better problem solving of problematic student issues. Results were seen for both new and veteran teachers. New teachers felt supported and veteran teachers felt rejuvenated. Teachers in the schools where implementation fidelity was not achieved rated aspects of the program significantly lower than did teachers in the other two schools.

II - Background

The Importance of 9th Grade

Ninth grade is a pivotal year for students. Numerous studies document that academic performance in 9th grade often sets the student's trajectory throughout the high school years, as well as the probability of graduation (e.g., Benner, 2011; Neild, 2009; Weiss & Baker-Smith, 2010). For example, students are 3-5 times more likely to fail a class in 9th grade than students in any other grade (Southern Regional Educational Board, 2002). Almost one quarter of students in the top quartile of their eighth grade class were off track by the end of 9th grade (Allensworth & Easton, 2005). Twice as many high-achieving low-income students failed to graduate on time compared to high-achieving high-income peers (Wyner et al, 2007). Overall, 70-80% of students who fail in 9th grade will not graduate from high school (Wyner et al, 2007).

The transition to 9th grade includes developmental, academic, and structural challenges. Neild (2009) proposes several possible explanations for why students get off track in the 9th grade:

1) Developmental and life course changes where parental influence wanes, and children have more autonomy, reduced parental supervision and support while peer influence increases. These can lead to increased risk taking and declining academic performance.

2) Transition to a new school that involves breaking the social bonds that students had formed with their teachers and peers from the middle grades. Students must negotiate new social relationships and adapt to the practices and routines of the new school.

3) Inadequate preparation for high school where students who struggled academically or who were inadequately challenged before high school fall even further behind. Students with poor math and reading skills are overwhelmed by academic demands of high school and get discouraged that they will ever complete it.

4) High school organization and climate in which the traditional social organization of high school encourages teachers to focus on the subject matter and not the students. Students have different teachers for each subject, and teachers have little or no opportunities to learn how students are doing in other classes (Benner, 2011; Neild, 2009).

Given these challenges and the critical nature of the 9th grade year, several programs

have emerged to help students make a successful transition to high school. These programs include Project Transition (Neild, 2009), Talent Development (Kemple, Herlihy, & Smith, 2005), Diplomas Now (Balfanz, Bridgeland, Fox, DePaoli, Ingram, & Maushard, 2014; Corrin & Sepanik, 2014), On-track Indicator developed by UChicago CCSR (Allensworth & Easton, 2005; Roderick, Kelley-Kemple, Johnson, & Beechum, 2014), early warning systems (Heppen & Therriault, 2008) and ninth grade academies (Cook, Fowler, & Harris, 2008). These programs focus on the challenges to 9th grade success and vary in the comprehensiveness of their approaches. They also vary on the extent to which they address the four underlying theories for student difficulty in 9th grade. Some focus on monitoring student progress, providing access to supportive adults, preparing students for the transition, or restructuring high school into small learning communities. Empirical evidence for the effectiveness of these approaches has been modest due to a lack of rigorous evaluation methods that vary from pre and posttest designs, quasi-experiments, interrupted time-series, and most recently, a school-level randomized controlled trial.

At the same time, research is emerging on the effectiveness of social emotional learning (SEL) interventions and strategies in producing not only increased attendance and decreased behavior problems, but also in increasing academic performance. For example, Allen, Pianta, Gregory, Mikami, and Lun (2011) conducted an RCT in which teachers were given a year of coaching on effective teaching and student-teacher interactions. After a year of training, students with teachers in the experimental group scored significantly higher on end of the year achievement tests than did students in the teacher control group. Quality of student-teacher interaction was a significant mediator of student achievement.

Overall, SEL strategies that improve academics tend to be carefully planned, theory and research based, teach SEL skills for application to daily life, address affective/social dimensions of learning, coordinate efforts linked to academic outcomes, address key implementation factors, and involve family and community partnerships, continuous improvement, and outcome evaluation (Elias et al, 1997). BARR draws on skills developed by social emotional learning theory, and focuses on student self- awareness, responsible decision-making, relationship skills, social awareness, and self- management.

Educational, resilience, and developmental research confirms that positive school climate, school connectedness, learning engagement, and positive relationships between students and staff—and among staff— are essential ingredients for school reform. (Cohen 2006; De La Ossa 2005; Gordon 2006; Jerald 2006; National Research Council 2004). The

degree to which students feel personally connected to their schools has been linked to attendance, performance, and graduation (Blum & Libbey 2004; Loukas et al., 2006; Wentzel1999). However, positive relationships and a sense of community are not enough to produce achievement gains among students without a clear emphasis on academic excellence by school staff (Lee & Smith, 1999). Quality pedagogy, caring relationships, high expectations, and real-time access to student data are all critical in fostering a positive school climate that promotes achievement.

The Building Assets Reducing Risks (BARR) Model

The Building Assets Reducing Risks (BARR) model is a comprehensive approach that addresses developmental, academic, and structural challenges in the 9th grade year through the implementation of eight different school-wide and individual strategies. It combines teachers' real-time analysis of student data, student asset building, and intensive teacher collaboration to prevent course failure. It reaches all students and teachers, and uses SEL skills to help increase academic performance. It develops positive student-teacher relationships and integrates student supports into a school's existing model for addressing non-academic barriers to learning.

BARR was developed in 1998 by Angela Jerabek, a 9th grade guidance counselor at Saint Louis Park High School in Minnesota. Prior to BARR implementation, the 9th grade course failure rate at St. Louis Park High School ranged from 44 to 47 percent. After one year of implementing the BARR model, the failure rate decreased to 28 percent and held steadily at 20 percent or lower for the next 15 years. (Evans, Sharma, & Jerabek, 2013).

BARR is built on three developmental theories: first, developmental assets which are forty internal and external sources of support that are critical to young people's successful growth and development (Scales & Roehlkepartain, 2003). The more assets young people experience, the more they engage in positive behaviors). Second, risk and protective factors, a social development strategy developed by Hawkins and Catalano, that addresses substance abuse, delinquency, teen pregnancy, school dropout, and violence (Hawkins & Catalano, 2002). Third, the attribution theory of student motivation that articulates the cognitive-behavioral-social process by which students develop beliefs about their ability to succeed in school (Wentzel & Wigfield, 2009).

The BARR model consists of eight strategies that are interconnected and function as a whole. These strategies include:

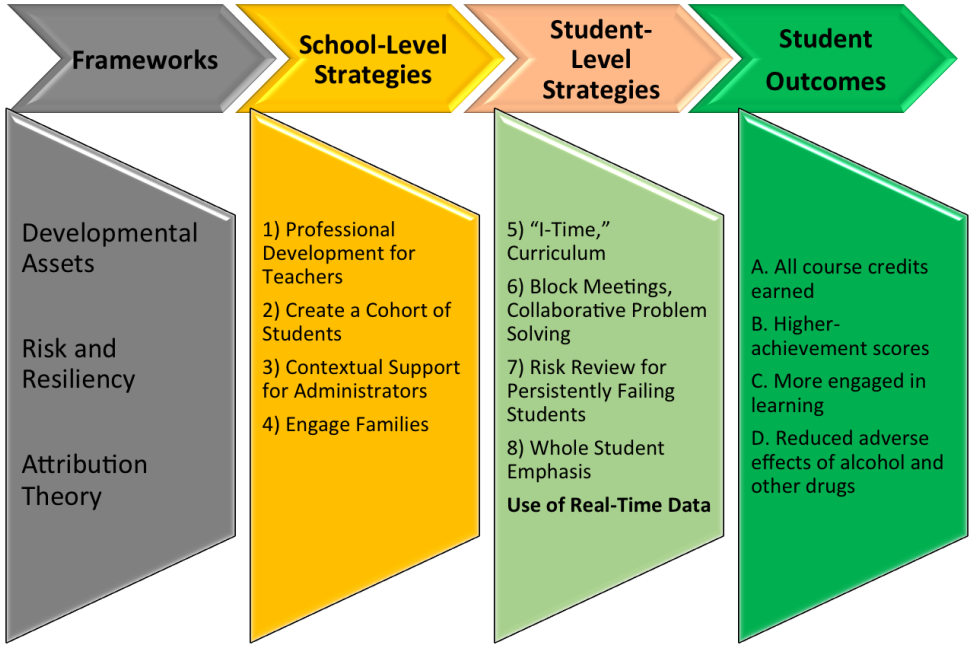
1) **Provide professional development for teachers, counselors, and administrators.** Professional development focuses on using student-teacher relationships to enhance achievement. It begins before the model is implemented and continues throughout the school year. This training is conducted by two trainers and one of the trainers is a BARR educator. There are also monthly meetings in which the 9th grade teachers continue to receive professional development.
2) **Create cohorts of students.** In the BARR model, students take three core courses as part of a block, or cohort, of students. Each block has three core-subject teachers (typically math, English, and science or social studies), and the teachers' and students' schedules are aligned so the students take these three core subjects only with other students in their cohort. This structure helps educators cultivate connections — with students and with each other — that allow for more effective education. For example, in a school with an average of 30 students per class, a cohort would include three teachers and 90 students. Each of the three teachers (English, math, and social studies, for example) would teach three 9th grade sections of his or her class — 30 students per class to make up the cohort of 90 students. At times, these teacher groups are joined by the BARR Coordinator, Social Worker, 9th Grade Counselor, and Assistant Principal.
3) **Engage families in student learning.** BARR improves communication with families and makes them active partners. Families are invited to participate in an initial orientation and a parent advisory council. Teachers also regularly call and meet with the parents or guardians of students who need more support so the educators and families can work together more effectively.
4) **Use BARR's I-Time Curriculum to foster a climate for learning.** I-Time is a 30-minute weekly lesson that students take with others in their cohort as a supplement to the school curriculum. Taught by one or more of the cohort's three core-subject teachers, I-Time's social/emotional focus helps students build strong relationships with teachers and each another — and practice essential life skills, such as communicating effectively and setting personal goals. I-Time also addresses important issues for adolescents, including substance abuse, grief, and bullying.
5) **Hold regular meetings of the cohort teacher teams.** The three teachers in a cohort have the same scheduled planning period. The teacher team meets weekly to discuss

each student in the cohort using student-level performance data that is updated weekly. The teacher team evaluates each student's progress as well as academic and non-academic obstacles to learning. In these collaborative sessions, teachers identify students who are not on track and determine how to intervene to support them. At least once a week, the counselor, social worker, BARR coordinator, and assistant principal (or administrator in charge of discipline) meet with each group of teachers to facilitate review and referrals.

6) **Conduct risk-review meetings**. Cohort teacher teams identify persistently low-performing students and refer them to a risk review team, which includes the school's BARR coordinator, a school administrator, a school social worker/counselor, and other professionals as needed. This team is trained to help the students most in need so the highest-risk students get essential external support — and the cohort teachers are able to focus on other students in their group.
7) **Focus on the whole student.** In every interaction with students (or discussions about students), educators address students' academic, emotional, social, and physical needs. Teachers work to better understand and build on students' strengths — and proactively address the non-academic reasons why they may fall behind in school and what they need to thrive.
8) **Administrator engagement.** Before the school implements the BARR model, administrators learn how they can integrate BARR into their school culture and use it to make decisions that further their specific school goals. Administrators engage in ongoing support, involvement, communication with the BARR team in their school.

The theories underlying the BARR Model, eight school and student-level strategies, and student outcomes are articulated below in the BARR Logic Model.

Building Assets Reducing Risks Logic Model



This i3 Development grant addressed the following research questions:

1. What is the impact of one year of participation in BARR on 9th grade students' total credits earned toward graduation in their core classes, as compared to students who do not participate in BARR?
2. What is the impact of one year of participation in BARR on 9th grade students' academic achievement in reading, as compared to students who do not participate in BARR?
3. What is the impact of one year of participation in BARR on 9th grade students' academic achievement in mathematics, as compared to students who do not participate in BARR?
4. What is the impact of one year of participation in BARR on 9th grade students' credits earned, NWEA mathematics and reading scores on more and less proficient students?

Chapter III - Impact Study: Within-School Randomized Controlled Trial (RCT) of the BARR Model

The three schools in the i3-supported grant were purposefully chosen to test replicability in different geographic locations and in different size schools. Two smaller schools in rural Maine and one larger school in southern California participated in the grant. In addition, the school where BARR was developed served as a laboratory site to test implementation fidelity instruments and refine the BARR strategies. The school in southern California was willing and large enough to conduct a within-school randomized controlled trial. Those findings are detailed in this section.

Overall, the results of the RCT study indicated that students in the BARR condition earned significantly more core credits, higher grade point averages, and higher scores on the spring NWEA mathematics and reading tests compared to students in the non-BARR condition. Subgroup analysis revealed that Hispanic students in BARR achieved significantly higher spring NWEA mathematics and reading test scores than did Hispanic students in the non-BARR condition. Also, students with lower academic proficiency who were in the BARR condition earned significantly more core credits and higher NWEA mathematics and reading scores than did students with lower academic proficiency who were in the non-BARR condition. The more academically proficient students in the BARR condition achieved significantly higher spring NWEA mathematics scores than did the more academically proficient students in the non-BARR condition.

The following section describes the selection of teachers, random assignment of students, student and teacher participants, materials and procedure, data collection and analysis, and results.

Selection of teachers and random assignment of students

- **Selection and assignment of study teachers**. Principals assigned teachers to BARR or non-BARR conditions. They were told not to select the best or most willing teachers to be part of the BARR intervention but to mix teachers as evenly as possible according to years of experience, gender, level of education, and ethnicity. Random assignment of

teachers in the 9th grade BARR model was not possible due to a number of limiting factors such as licensure/credentials and unique electives taught by teachers, as well due to the need to balance staff FTE within subject area, which is especially true for math and science.

- **Identification of eligible students.** The evaluation sample included all students who were enrolled in regular core classes (language, math, science, social studies) at the school and available to the BARR program. This excluded students in sheltered special education classes or sheltered classes for students with very limited English proficiency. Ineligible students were identified prior to random assignment.
- **Student assignment procedure.** Students were randomly assigned to BARR and non-BARR groups by Abt Associates, the i3 oversight evaluators, sorted to ensure balance of gender and ethnicity and sent back to the school. Prior to random assignment, the only request made by the principal was to ensure that twins or close family members (e.g., cousins) be in the same condition, either BARR or non-BARR. This was done to avoid community conflict or family perception of differing conditions within the school. In these cases, the pairs were randomly assigned by Abt Associates.

Participants

Students. The study was conducted in a large suburban high school in southern California with a total enrollment of 2,514 students in grades 9-12. A total of 555 9th grade students, 54% female and 46% male, participated in the study. Students educated in sheltered instruction were excluded from participating. Racial composition was 52% Caucasian, 37% Hispanic, and 11% African American, Asian, American Indian, or mixed races. Sixty-eight percent of students were eligible for the free or reduced price lunch program, and 17% were ELL students.

To form the groups of more or less proficient students, we computed the median for the fall reading and mathematics Northwest Evaluation Association (NWEA) scores. Students at or above the median on both tests were classified as "more proficient" (n= 203) and those below the median on either one or both tests were classified as "less proficient" (n= 318).

Teachers. Table 1 lists the demographics of teachers participating in the BARR impact study.

Table 1. BARR Teacher Demographics at Hemet High School during Randomized Controlled Trial (School Year 2011-2012)

	Number	Female	Male	Caucasian	Hispanic	Other	Experience	BA/BS	MA/MS
BARR	9	6	3	9	0	0	13 yrs. *	2	7
Non-BARR	17	14	3	16	1	0	13.5 yrs.**	2	15

*Mean number of years, SD=8.23; ** Mean number of years, SD=8.52

There were no statistically significant differences between BARR and Non-BARR teachers on any of the demographic variables. In terms of sample size, there were almost twice as many Non-BARR teachers (n=17) as there were BARR teachers (n=9). This is due to the restructuring that is part of the BARR Model (affecting the BARR side) but which did not affect the Non-BARR side. BARR blocks in this year consisted of English, Mathematics, and High School 101 subject areas. Science was not blocked during this year, due to the large number of science subjects taught in 9th grade; therefore, science teachers are not included in Table 1. All teachers on both the BARR and non-BARR side were credentialed in their subject areas.

Materials and Procedure

The BARR model was implemented with the experimental group during school year 2011-2012. The non-BARR group was “business as usual.”

- A site coordinator was chosen by the principal to help carry out implementation of the BARR model and to act as a liaison between the school and the BARR technical assistance provider and evaluators. The site coordinator serves as a key conduit of information (i.e. failure rate trends, policy impacts/revisions) between the BARR teams and principal which provides contextual support and leads to systemic change. The coordinator is also tasked with implementing recommended improvements provided by BARR technical assistance providers in order to achieve and maintain high fidelity.
- Teachers and administrators received two days of training on developmental assets and the BARR model.
- To assist with implementation of the eight BARR strategies, a technical assistance provider called the BARR coordinator at least weekly. In addition, the project director and BARR coordinator from St Louis Park High School conducted monthly Professional

Learning Community conference calls with the coordinators and principals from all the schools, including the non-RCT schools.

- The importance of random assignment and maintaining the integrity of the design was emphasized to the principal and site coordinator. On a regular basis, the site coordinator shared with the technical assistance provider information about any changes of status in study students. Change of status might occur, for example, when a student left the district, was provided a Special Education plan, or was moved to a different level of English language proficiency.
- BARR developed a system that classified all students as Level 0, 1, 2, or 3, in order to identify, communicate and intervene with students who are in need of support to prevent academic failure and accelerate students to achieve at their highest potential. This common language works to align school and community wide resources which improves the efficiency of student intervention and support. Level 0 are thriving students: Students passing all courses, socially-emotionally resilient, may occasionally need additional help to do their best and classroom teacher provides this support or student recovers on their own. Level 1 are brief intervention students - Students are failing one or more courses for two weeks or more during the quarter. They are socially-emotionally typical of other high school students. Student not responding to Brief Intervention are advanced to Level-II. Level II are Students are still failing after Brief Intervention. They may have social, behavioral, or mental health problems affecting school progress. If students continue to fail and have persistent and serious social, behavioral, or mental health problems during Team Intervention, the site coordinator asks Risk Review Team (Counselor/SW) members if the student should be enrolled in their review. Level III – Risk Review intervention - Students not successful in Team Intervention and/or students require immediate evaluation for referral to community resources. They are followed after Risk Review Intervention in Risk Review meetings.

Data Collection and Analysis

Data were collected at the end of each semester on credits earned and NWEA achievement scores. NWEA tests were administered by the school at the beginning and end of the academic year. Each school was assigned a window of time during the beginning of the school year in which to administer this test (window determined by the national center). Typically, testing occurred in October and May.

Separate OLS regression analyses were conducted to predict total core credits earned and spring NWEA reading scores. For both of these analyses, Study Group, Gender, Hispanic origin, and fall NWEA reading scores served as predictor variables. An additional OLS regression analysis was conducted to predict spring NWEA mathematics scores, using Study Group, fall NWEA mathematics scores, Gender, and Hispanic origin as predictor variables. We did not impute missing data. Since our analyses consisted of three univariate models we only included students who had data on that particular outcome.

Results

Attrition.

Tables 1a, 1b, and 1c in Appendix A list the attrition rate for credits earned, NWEA reading scores, and NWEA mathematics scores. Overall attrition, as well as differential attrition were low and within acceptable standards. For credits earned, overall attrition was 1.3% and differential attrition was 1.8%. For NWEA reading, overall attrition was 10.8% and differential was 9.4%. For NWEA mathematics, overall attrition was 8.7% and differential attrition was 7.3%.

Core Credits Earned

Tables 3a, 3b, and 3c in Appendix C present the mean number of core credits earned and mean NWEA reading and mathematics scores for fall and spring by Study Group, Gender, and Hispanic origin. Figure 1 displays the mean credits earned by BARR and non-BARR groups.

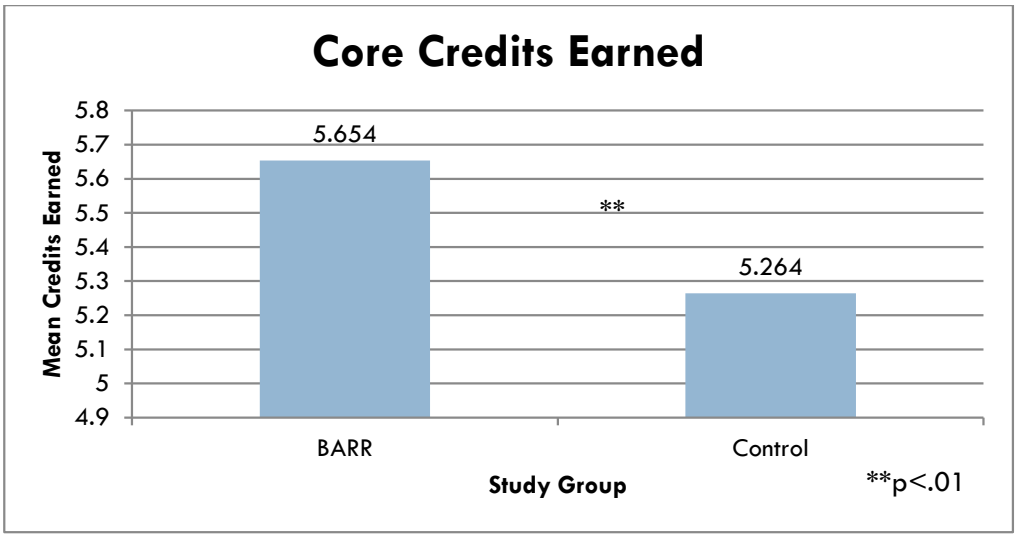


Figure 1. Core credits earned by study group

Table 4a in Appendix D displays the results of the regression analysis that predicts mean number of core credits earned. The model significantly predicted 15.8% of the variability in core course credits earned (F (4,516) = 24.205, p<0.001). Study Group was a significant predictor, as was fall NWEA reading scores. Students in the BARR experimental group earned significantly more core course credits (M=5.65) toward graduation than students in the non-BARR group (M=5.39). Neither gender nor Hispanic origin was a significant predictor of core credits.

Grade Point Average

In addition, we analyzed Grade Point Averages (GPAs) between students in the BARR and non-BARR conditions. While GPA as an outcome measure is subject to criticism because of its subjective nature, we nonetheless examined GPAs as a measure of *quality* of work. Students in the BARR treatment group earned significantly higher cumulative GPA in core courses (average GPA=2.91) as compared to students in the non-BARR group (average GPA=2.67) by the end of their 9th grade year (t=2.729, df = 533, p=.007, effect size = .24). The results held true when examining fall semester GPAs (t=2.566, df = 546, p=.011, effect size =.24) and spring semester GPAs (t=2.924, df = 533, p=.004, effect size = .25).

Spring NWEA Mathematics Scores

A second measure of academic progress was growth in achievement scores on NWEA standardized tests of reading and mathematics administered in fall and spring to all 9th-grade

students. Table 4b in Appendix D displays the results of the regression analysis to predict spring NWEA mathematics scores and Figure 2 presents the results graphically. The model significantly predicted 77% of the variability in spring NWEA mathematics scores ($F(4,470) = 388.118$, $p<0.001$).

Study Group was a significant predictor, as was fall NWEA mathematics scores. On average, students in the BARR experimental group improved 6.45 points while students in the non-BARR group improved 1.14 points. This translates into an improvement of two grade levels for the BARR experimental group (8th grade to 10th grade equivalent) compared to the loss of one grade level (8th grade to 7th grade equivalent) for the non-BARR group. Gender was not a significant predictor of spring NWEA mathematics scores, but Hispanic origin was significant with non-Hispanic students earning higher spring NWEA mathematic scores than Hispanic students across experimental conditions.

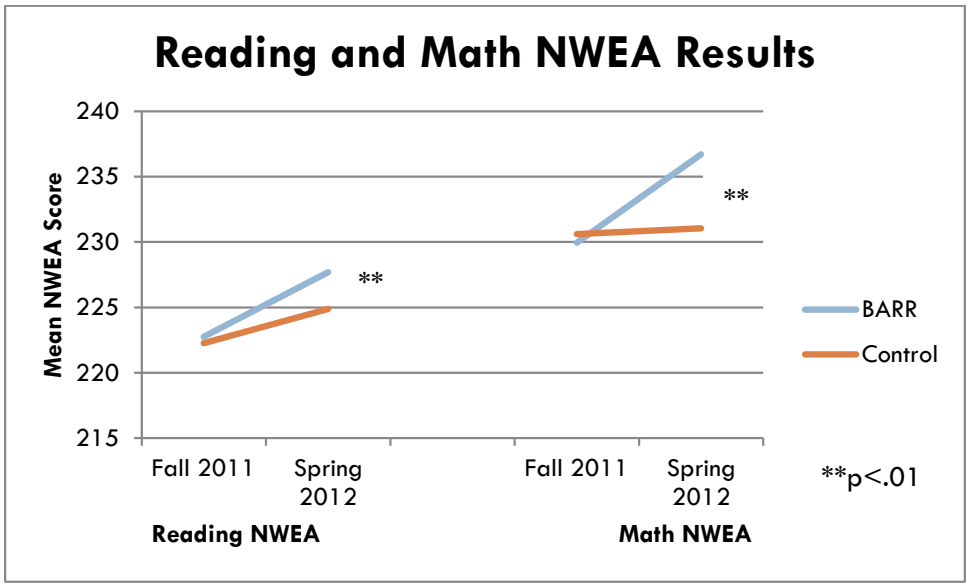


Figure 2. Reading and Mathematics NWEA Results

Spring NWEA Reading Scores

Table 4c in Appendix D displays the results of the regression analysis to predict spring NWEA reading scores and Figure 2 displays the results graphically. The model significantly predicted 67% of the variability in spring NWEA reading scores ($F(4,490) = 251.841$, $p<0.001$). Study Group was a significant predictor, as was fall NWEA reading scores. On average, students in the BARR experimental group improved 4.51 points while students in the

non-BARR group improved 2.70 points. Both groups scored above grade level in the fall and continued to score above grade level in the spring. Gender was not a significant predictor of spring NWEA reading scores, but Hispanic origin was significant with non-Hispanic students earning higher spring NWEA reading scores than Hispanic students across experimental conditions.

Table 2 below lists the grade equivalents for NWEA scores for BARR and Non-BARR students in fall and spring test administrations.

Table 2. Grade Equivalents for NWEA Scores by condition

	Reading		Mathematics	
	Fall	Spring	Fall	Spring
Non-BARR	9.5	11+	8	7
BARR	10	11+	8	10

Hispanic Ancestry Subgroup

Table 3c in Appendix C lists descriptive statistics by Hispanic Ancestry. An OLS regression (see Tables 4b and 4c in Appendix D) revealed that across treatment conditions, Hispanic students scored significantly lower on spring NWEA mathematics tests ($t(2,480) = 2.842$, $p=0.013$) and reading tests ($t(2,493)=-2.601$, $p=0.010$) than did non-Hispanic students.

However, when analyzed according to treatment condition, Hispanic students in the BARR condition achieved significantly higher spring NWEA mathematics ($t(2,183) = 2.740$, $p=0.007$) and Reading ($t(2,187) = 2.066$, $p=0.040$) scores than did Hispanic students in the non-BARR condition. Core credits and GPA were also higher for Hispanic students in the BARR condition than for Hispanic students in the non-BARR condition, but differences were not statistically significant.

Non-Hispanic students in the BARR condition earned significantly more credits ($t(2, 343) = 3.72$, $p = 0.001$), and achieved higher NWEA Mathematics scores ($t(2,317) = 2.447$, $p=0.015$) than did non-Hispanic students in the non-BARR group. Reading scores and GPA were higher for students in BARR compared to those in the non-BARR condition, but the differences were not statistically significant.

Figures 3 and 4 display differences between Hispanic and non-Hispanic students by study group for both NWEA mathematics and reading scores.

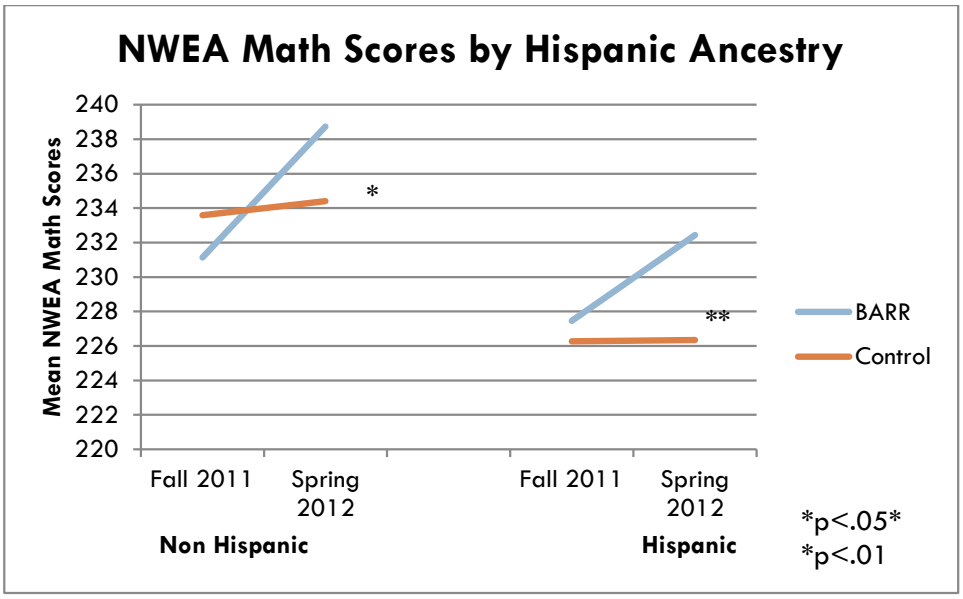


Figure 3. NWEA mathematics scores by Hispanic ancestry

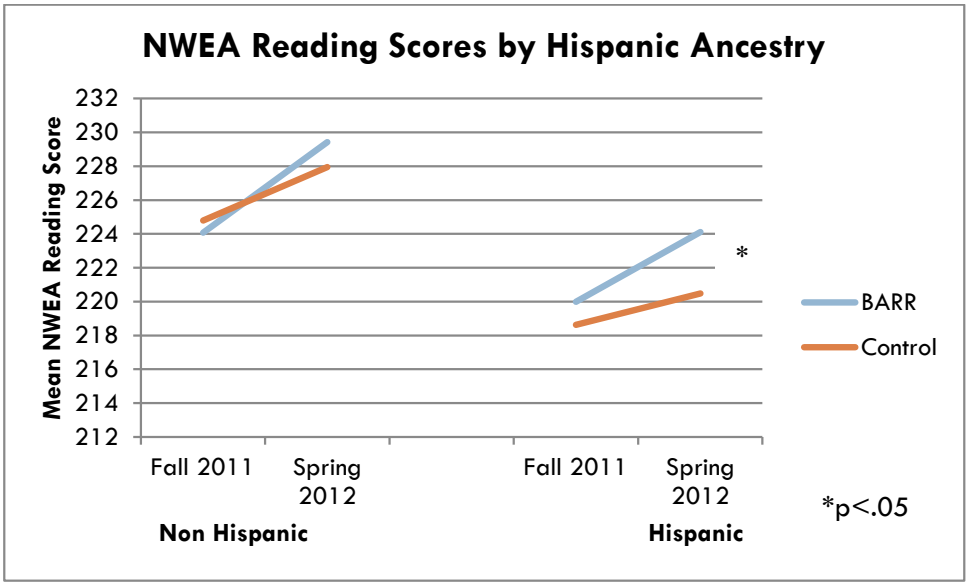


Figure 4. NWEA Reading scores by Hispanic ancestry

Academic Proficiency Subgroups

Students in both the BARR and Non-BARR groups were separated into two groups based on scores they obtained on NWEA reading and mathematics tests in the fall. Less Proficient students were defined as those who scored below the median on either the NWEA mathematics or reading tests. More Proficient students were defined as those who above the

median on both the NWEA mathematics and reading tests. Table 2 in Appendix B lists the descriptive statistics for each group. Separate OLS regression analyzes were conducted by proficiency group for each of the outcome measures (see Appendix F, Tables 6a-6f).

As displayed in Figure 5, Less Proficient students in the BARR condition earned significantly more credits in core classes compared to Less Proficient students in the non-BARR condition (p=0.020, effect size = .29). More Proficient students in the BARR condition also earned more core credits than More Proficient students in the non-BARR condition, but this difference was not statistically significant.

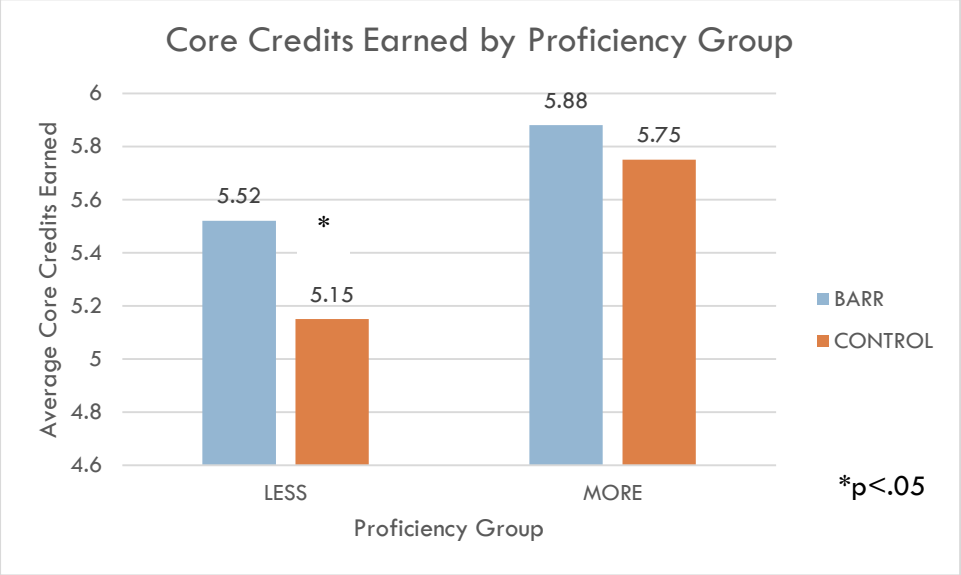


Figure 5. Core credits earned by proficiency group

In terms of scores achieved on the NWEA reading test, Less Proficient students in the BARR condition earned significantly higher spring test scores than their Less Proficient peers in the non-BARR condition (p=0.005, effect size = 2.49). More Proficient students in the BARR condition also achieved higher test scores than More Proficient students in the non-BARR condition, but this difference was not statistically significant (see Figure 6).

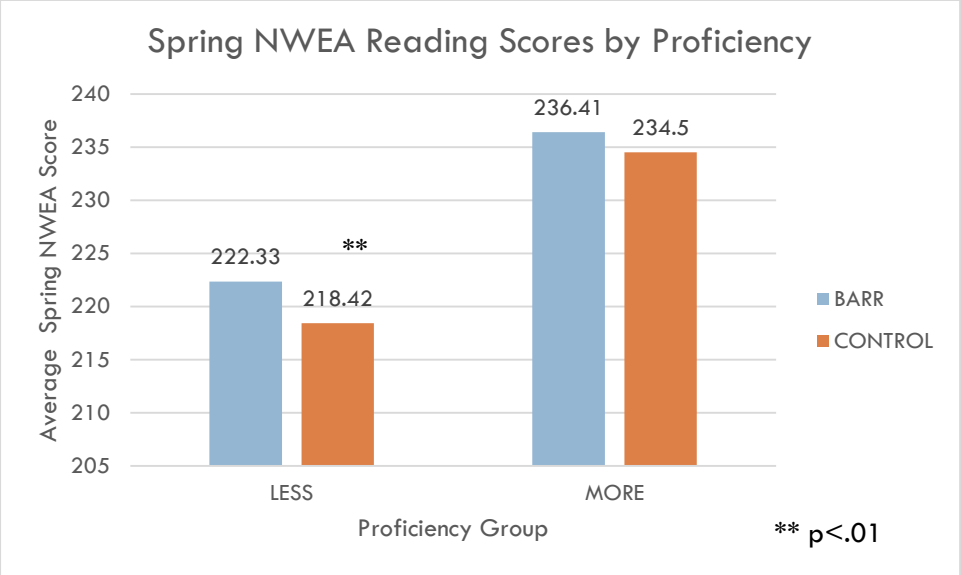


Figure 6. Spring NWEA reading scores by proficiency group

Students in both the More and Less Proficiency groups who were in the BARR condition earned significantly higher NWEA spring mathematics scores than students of both proficiency groups in the non-BARR condition (see Figure 7). BARR students who were Less Proficient outperformed their Less Proficient non-BARR peers (p=0.001, effect size=4.24) and BARR students who were More Proficient outperformed their More Proficient non-BARR peers (p=0.001, effect size=6.24).

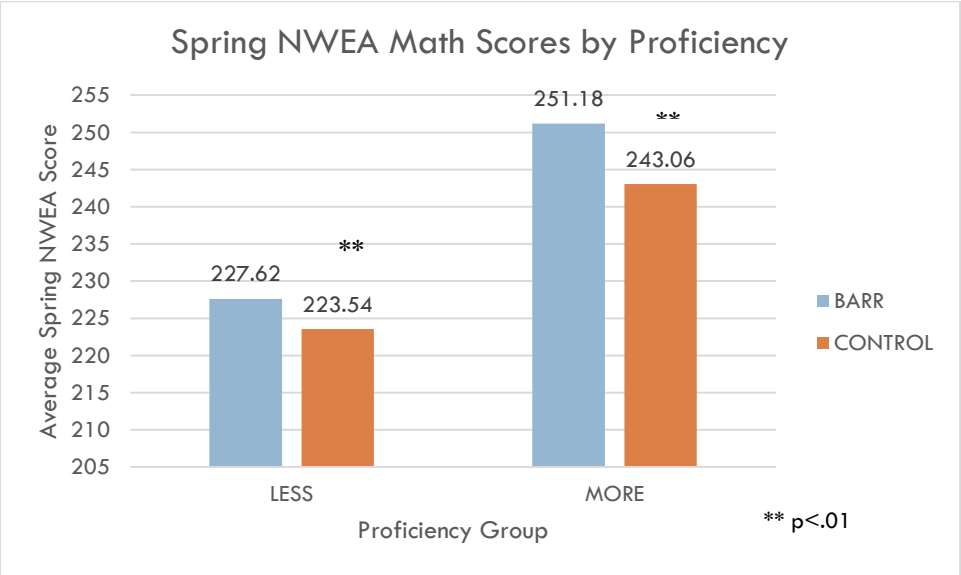


Figure 7. Spring NWEA mathematics scores by proficiency group

After the RCT: BARR in Years 2 and 3

After the RCT year, the school chose to continue BARR and implement it with the entire freshman class. We continued to collect impact and implementation fidelity data in years 2 and 3 of the project. In addition, we developed a new metric, student failure rate (the percentage of students who failed one or more courses at the end of the 9th grade), which was a useful measure for schools. At the end of the RCT year in year 1, the student failure rate was 31.9% for non-BARR students and 21% for BARR students. After full implementation in the 9th grade, failure rate continued to decrease and by year 3, the failure rate was down to 18.5% for all students; a decrease of 42% from before BARR was introduced. The quality of student work as measured by average GPA continued to improve. In year 1, the average GPA was 2.67 for non-BARR students, and by year 3 had increased to 2.76 for all students. The fidelity of implementation of all aspects of the BARR model demonstrated continual growth and reached a combined quality of implementation score of 93% by the end of year 3.

Table 3 presents average number of core course credits earned at the end of freshman year, number of failed core classes, failure rate as defined by the number of students with at least one failure in a core course, and Grade Point Average (GPA) for three cohorts of freshman classes. Results are presented for BARR and non-BARR groups separately in year 1. In years 2 and 3, all 9th grade students received the BARR model.

Table 3. Core Course Credits

Year	Number of students	Average number of core credits earned*	Number of failed core courses	Percent of students with at least one failure in a core course	Average GPA in core courses
Year 1 ***Non-BARR***	276	5.26 (87.7%)	181	31.9%	2.67
Year 1 ***BARR***	272	5.65 (94.2%)	90	21.0%	2.91
Year 2	517	5.63 (94.5%)	192	17.2%	2.70
Year 3	530	5.56 (92.7%)	231	18.5%	2.76

*Average number of attempted core credits was 6.00.

Figure 8 displays the student failure rate for years 1-3. By the end of year 1, non-

BARR students had a failure rate of 32%, compared to a failure of 21% for students in the BARR group. By years 2 and 3, the failure rate for all 9th grade students continued to decline to between 17-18%.

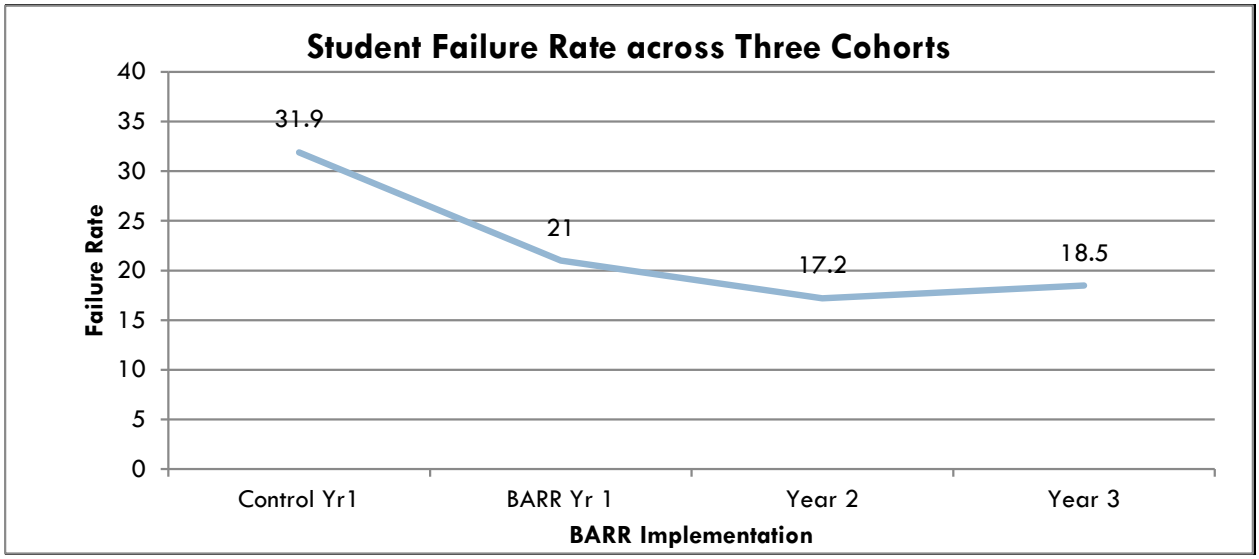


Figure 8. Student failure rate across three cohorts of BARR implementation

During the three years of BARR implementation in the freshman year:

- Percentage of core credits earned increased from 87.7% for non-BARR students to 92.7% for all students.
- Number of failed core courses decreased by 50% in year 1.
- In year 1, the student failure rate was 31.9% (for non-BARR students) and by year 3, it was down to 18.5% for all students; a decrease of 42%.
- Average GPA for the BARR students in year 1 and for all students in subsequent years was consistently higher than the non-BARR average GPA in year 1

Academic Performance by Gender

Table 7a in Appendix G presents the student failure rate by gender across three cohorts of 9th grade students, and Figure 9 presents these results graphically.

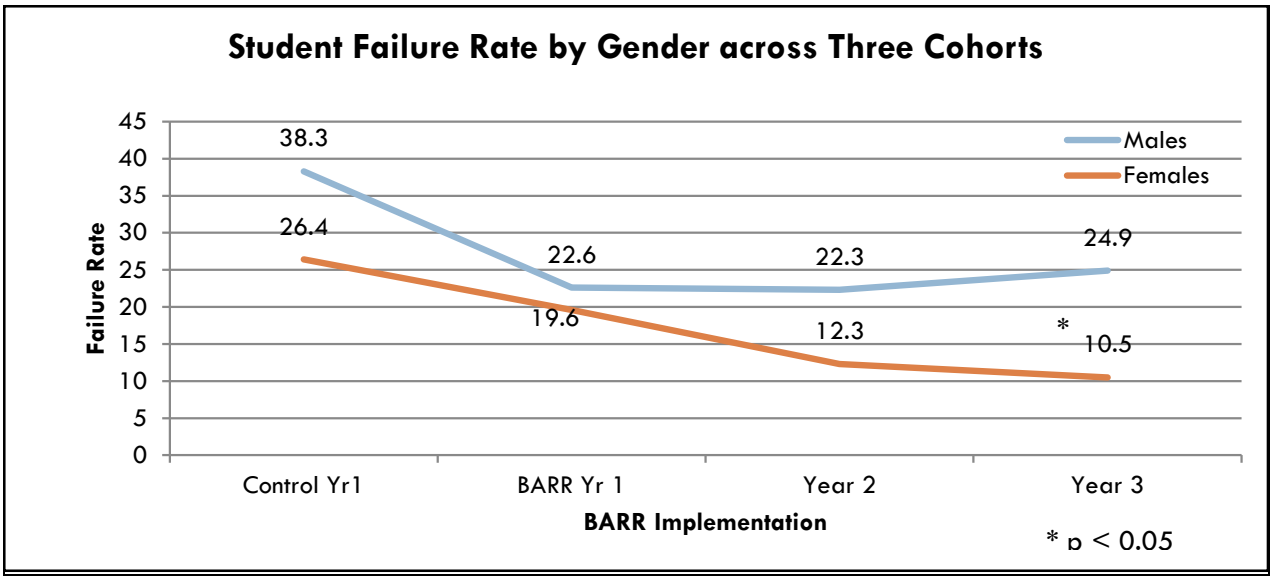


Figure 9. Student failure rate by gender across three cohorts of BARR implementation

During the three years of BARR implementation in the freshman year:

- Over time, percentage of core credits earned by boys increased 5 percentage points to 90% (85.2%, year 1 non-BARRs to 90.0%, year 3) and 6 percentage points for girls (90.0%, year 1 non-BARRs to 96.1%, year 3).
- Failure rate decreased from 38.3% to 24.9% for boys, and from 26% to 10.5% for girls from year 1 non-BARRs to year 3. This difference was statistically significant in year 3 in favor of girls, i.e., girls had a statistically significantly lower failure rate than boys.
- Average GPA did not change significantly for boys, but improved for girls from 2.82 to 3.05 from year 1 non-BARRs to year 3.

Closing the Achievement Gap

Of particular note in years 2 and 3 was the decline in student failure rate for Hispanic students and closing of the achievement gap between Hispanic and non-Hispanic students. Failure rates for Hispanic students went from 41.6% in year 1 for students in the non-BARR group to 21.1% for all Hispanic students in year 3; a reduction of 50%. By the end of year 2, the failure rate for Hispanic students was no longer statistically significant from the failure rate of non-Hispanic students. This trend continued in year 3. In addition, the average GPA earned by Hispanic students increased from 2.44 for non-BARR students in year 1 to 2.75 for all Hispanic students in year 3.

Table 7b in Appendix G lists the average number of core credits earned, failed core classes, failure rate, and GPA in core courses. Figure 10 compares the student failure rate for Hispanic and non-Hispanic students across the three years of BARR implementation. By the end of year 1, a significant achievement gap was evident between Hispanic and non-Hispanic students in both the BARR ($X^2_{(1, n=270)} = 5.608$, $p<.02$) and non-BARR group ($X^2_{(1, n = 251)} = 5.331$, $p<.02$). However, by year 2, the gap had closed to reveal an 18% failure rate for Hispanic students and a 16% failure rate for non-Hispanic students. This trend continued into year 3, with both years showing no difference in failure rate between Hispanic and non-Hispanic students.

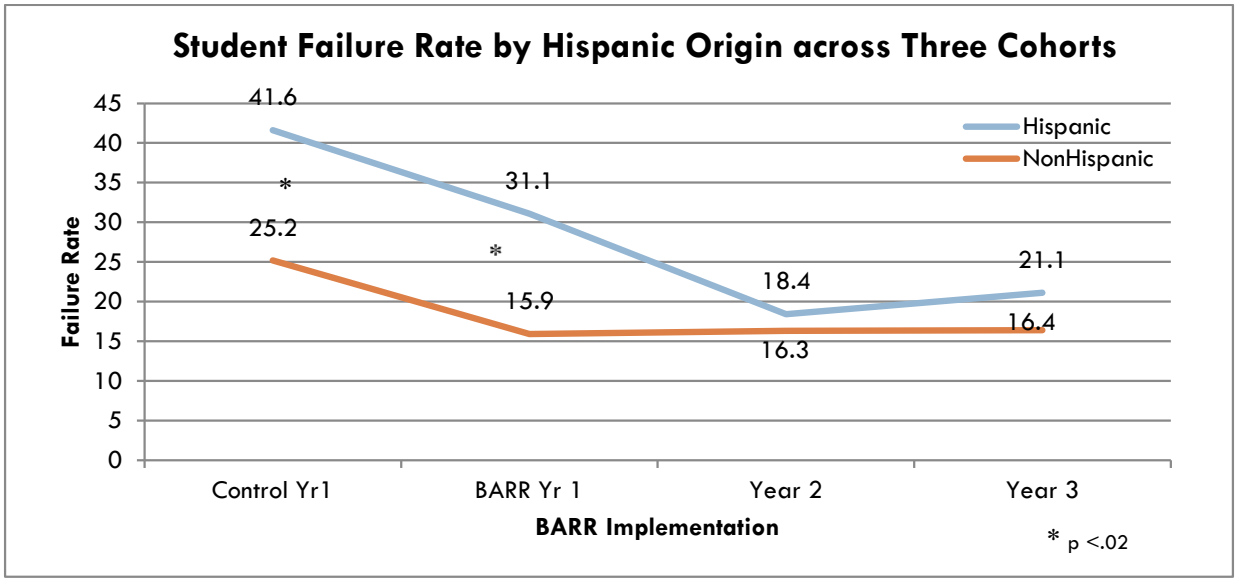


Figure 10. Student failure rate by Hispanic origin across three cohorts of BARR implementation

During the three years of BARR implementation in the freshman year:

- Percentage of core credits earned by Hispanic students increased from 85.2% (non-BARR group) in year 1 to 92.5% (all Hispanic students) by year 3.
- In year 1, Hispanic students in BARR had a lower failure rate than Hispanic students in the non-BARR group. Overall, though, Hispanic student failure rate was higher than non-Hispanics in both BARR and non-BARR groups.
- By year 3, Hispanic failure rates went from 41.6% (non-BARR) to 21.1% (BARR) a 50% reduction. The failure rate for Hispanic students was no longer significantly different from the failure rate of non-Hispanic students in Years 2 and 3.

- Hispanic students' average GPA increased from 2.44 for non-BARR students in year 1 to 2.75 in year 3.

Several aspects of the BARR Model provide an explanation for this closing of the achievement gap with Hispanic students. First, BARR begins with the individual student and provides a forum for multiple adults to know them. Through the effective use of data there is a transparency of who is doing well, who is struggling, and what their barriers may be both individually and collectively. BARR teacher teams adjust pedagogy to meet the differentiated needs of each student. This is core to closing the achievement gap.

Second, within teams, teachers discuss the macro and micro impacts of race and ethnicity with their colleagues. Block Meetings and Risk Reviews provide a safe and effective structure for teachers/staff to discuss sensitive issues, learn to address them with students, and scale the most effective strategies school-wide. This support enables teachers/staff to overcome biases, fears, and stereotypes and see students for who they are, which results in more effective teaching and closing the gap.

Third, The I-Time curriculum develops a sense of valuing and belonging that reduces fear in minority students that they will be stereotyped according to their race or ethnicity. Research reveals that once fear is reduced, students can focus on schoolwork, do better in classes, and form expectations of future success (Cohen et al, 2009).

Fourth, Interventions built on positive student teacher relationships encourage and support all students. Discussing each student on a weekly basis enables teachers who share the same students to identify, attempt, and scale strategies to maximize collective impact. The intentional execution of culturally appropriate I-Time lessons are included as one of the BARR Fidelity Behavioral Anchors.

Fifth, data on established levels of concern based on grades, attendance, and socio-emotional issues are applied systemically across the school to ensure that ALL students in need of support receive it and are prioritized to ensure maximum impact. Data drive the intervention and action plans which leads to a less political and more pragmatic result-oriented environment to close the achievement gap (Corsello, Jerabek, & Barbeau, 2015).

Sixth, at the beginning of Year 2, all teachers and counselors received a one-day training specific to equity issues and implementation of BARR.

Chapter IV - Measuring Implementation Fidelity

Fidelity of implementation is key to understanding the impact of the BARR Model. By the end of year 3, only two of the schools met the threshold for implementation fidelity using the Quality Assessment Rating forms. The school that did not reach implementation fidelity had higher student failure rates and lower teacher endorsement of the BARR strategies.

Implementation Fidelity in the Study Schools

Creation of implementation fidelity forms and data collection

During the first two years of the grant, we developed, tested, and refined four measures of implementation fidelity. One measure, conducted through an extensive interview with the site coordinator, measured the extent to which the 8 components of the BARR model were implemented in the school. The other three measures, conducted through evaluator observation of Block Meetings, Risk Review, and I Time, measured the quality of implementation of each of those components. In addition, we developed a teacher survey to measure the extent to which teachers felt that the BARR Model improved their effectiveness as teachers. In terms of the implementation fidelity forms, we followed the process described below.

- We drafted a fidelity metric to assess the extent and nature to which the 8 BARR strategies have been implemented in each school. We presented this metric to the schools in a collective meeting to obtain their input, and refined the metric accordingly to reflect the reasoned judgment and real-world experience of school staff and the BARR coordinator in each school. The BARR Strategy Implementation Review form served as our main measure of implementation fidelity.
- In addition to the BARR Strategy Implementation Review form, we developed three observation forms to gather data on the quality of implementation of Block Meetings, Risk Review Meetings, and I Time curriculum.
- We conducted site visits, each lasting 1.5 days, twice a year at each school during the three years of BARR implementation. During these site visits, we observed block meetings, Risk Review, and I Time. We also conducted interviews with the Superintendent, Assistant Superintendent, Principal, and Assistant Principal twice annually. At the end of each site visit, we met with each coordinator and arrived at a score for each school on each of the 8 strategies using the BARR Strategy

Implementation Review form. In addition to our own observations and interview data, we asked each coordinator for specific examples to substantiate the rating that was assigned.

- With this input from schools and project staff, we established a threshold for adequate fidelity for each strategy and summed across strategies. This was done using our theoretical knowledge of the program and judgment of minimal level required for adequate fidelity, as well as the realistic, empirical data obtained from these underperforming schools implementing the program for the first time. Using these two sources of information, we determined strategy-specific and program-level threshold scores. Abt Associates, our oversite evaluators, notified the BARR program met the Government Performance and Results Act (GPRA) standard for generating high-quality implementation results. Appendix H shows the thresholds for each key component, and the determinations of fidelity for each key component for the first two years using the BARR Strategy Implementation Review form.
- All of the fidelity forms were revised at the end of the grant period to include additional detail and precision in assessing implementation fidelity. We found that our initial forms were not able to detect lack of engagement and negative interactions between students and teachers, and between students, resulting in inflated implementation scores in some cases.

In addition to these measures, we developed a teacher survey to assess the degree to which teachers reported that the BARR strategies impacted various components of their teaching effectiveness.

Implementation Results - BARR Strategy Implementation Review

The BARR Strategy Implementation Review measures each of the 8 key components (strategies) of the BARR program through an in-depth interview with the site coordinator. During the interview, the site coordinator assigns a score from 1 to 9 for each of the 8 key components. The total range possible, summing across the 8 strategies, is 8 to 72. Figure 11 shows a graphical representation of BARR Strategy Implementation for the three replication schools in years 2011- 2014.

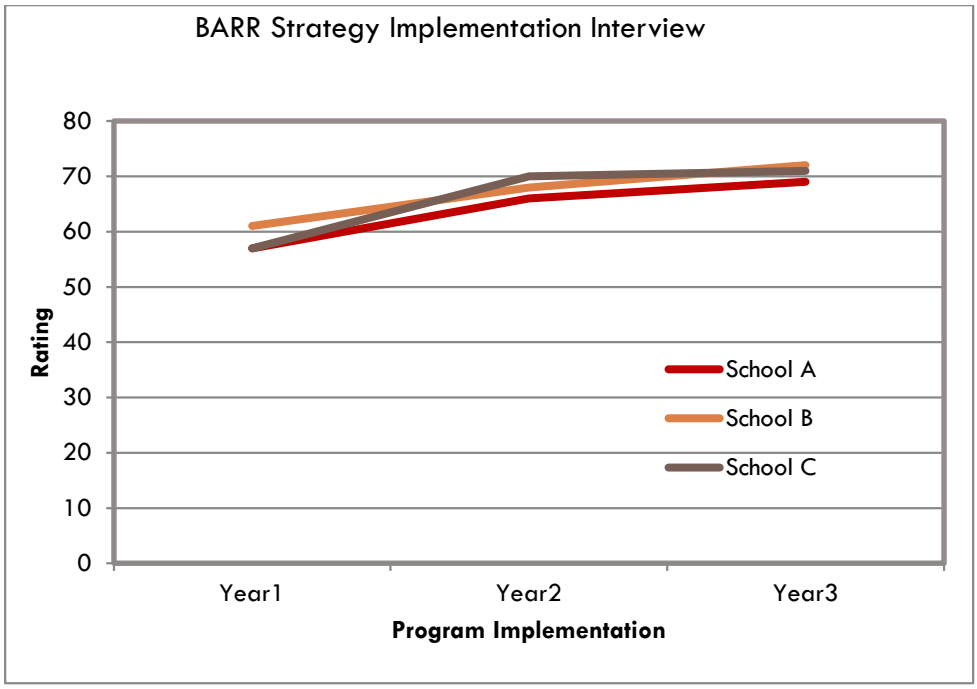


Figure 11. BARR Strategy Implementation Interview results

Observations of Block Meeting, I Time, and Risk Review

In addition to the BARR Strategy Implementation form interview, we observed a sample of Block Meetings, Risk Review Meetings, and I Time classes.

- **BARR Block Meeting Process Quality Assessment.** This observation form measures application of enrollment guidelines, consensus problem solving, identification of root causes, goal setting, identification of barriers and assets, development of promising solutions, and implementation of an action plan.
- **BARR I-Time Process Quality Assessment.** The observation form measures teacher mindset emphasizing student growth mindset, classroom management, assets as the focal point of the discussion, recognition of students' unique assets, recognition of student relationships, recognition of student challenges, recognition of student values, and classroom spirit.
- **BARR Risk Review Process Quality Assessment.** Measures on the observation form include application of enrollment guidelines, best practices for students in emerging crisis, best practices for engaged continuing issue students, best practice for unengaged continuing issue students, consensus problem solving, identification of root causes, goal

setting, identification of barriers and assets, development of promising solutions, and implementation of an action plan.

Summary of Observational Quality Assessment Ratings

In order to have one measure that represents the quality of BARR implementation, we calculated an overall summary of the observational ratings in the spring of each of the grant years in each school by combining all the observational scores into one average. The average was based on the percentage of points achieved in each component based on a total of 100%. Figure 12 presents this information.

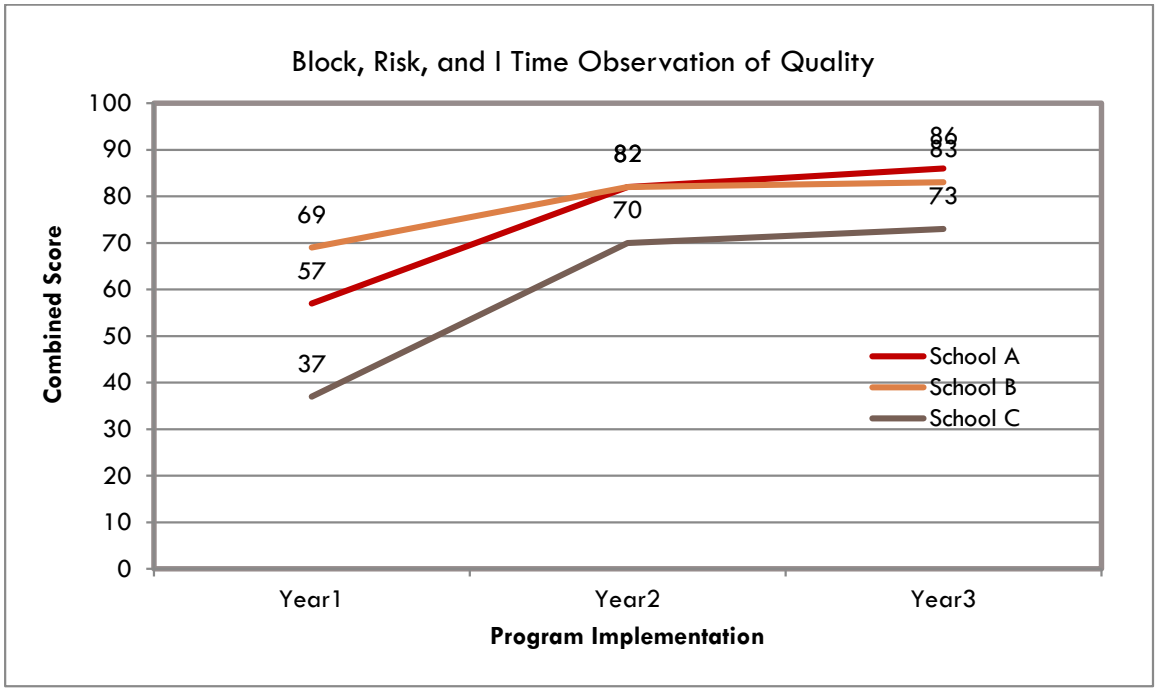


Figure 12. Block, Risk, and I Time observation of quality

All three schools achieved implementation fidelity on the BARR Strategy Implementation Interview indicating that all BARR structures were in place. However, only two schools achieved an implementation fidelity threshold of 80% on the quality of implementation based on a combination of the observational data from Block Meetings, I Times, and Risk Review. Revised forms will provide a more precise measurement of implementation fidelity that better represents the full range of responses in both structural and quality measures.

Relationship of Implementation Fidelity to Student Failure Rate

We then compared the core course failure rate in each school at the end of each year of implementation. Failure rate is defined as the percentage of students with one or more F's in a core course. The schools that improved in quality of implementation also had improved core course failure rates, while the school that did not improve in quality of implementation had a failure rate that increased. A Pearson correlation coefficient calculated between quality assessment observation scores and failure rate was -0.380, and although in the expected direction, was not significant ($p > .20$, $df = 7$). Individually, growth in implementation quality in I Time and Block Meeting were negatively correlated with failure rates, but again not significantly, perhaps due to the small sample (n=9 ratings). Overall, observations of implementation quality were more strongly related to student outcomes (i.e., core course failure rate) than were interview ratings that the BARR structural elements were in place (Sharma, Corsello, & Jerabek, 2014).

Feedback from BARR Teachers

As an additional part of the grant, we conducted a survey with 9th grade BARR teachers to gather their opinions about the BARR model, their relationships with students, and any impact that BARR may have had in improving their effectiveness as a teacher. The survey focused on the BARR strategies, with additional questions on the Block Meeting. There were a total of 19 questions that were rated on a 5 point Likert scale of strongly disagree to strongly agree. Appendix I contains the percentage of responses for each of the items.

A total of 46 staff members from Schools A, B, C, and D (the school where BARR was developed that served as a laboratory for testing new instruments and strategies) completed the survey through SurveyMonkey.com in June through August 2013. The number of respondents varied according to school size, with School A (13), School B (5), School C (18), and School D (10) respectively. Teachers indicated the number of years they have been teaching, with almost one third reporting they have taught for 6-10 years (see Figure 13).

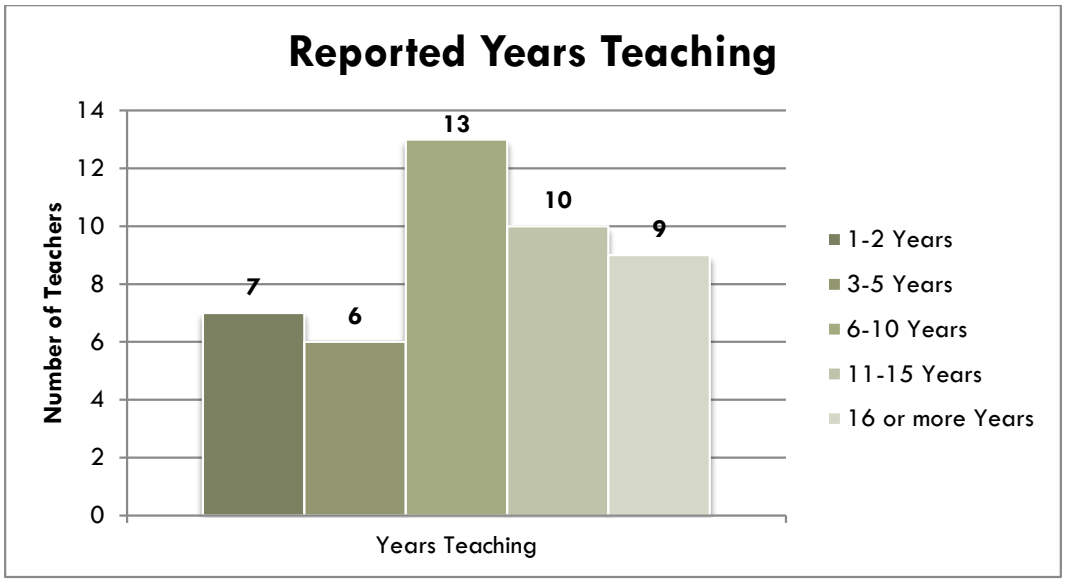


Figure 13. Reported years of teaching

Results

The categories of strongly agree and agree were combined to provide an overall endorsement of items. Results indicated that over 90% of teachers reported that they felt proud of their team's accomplishments for students, liked the opportunity to share ideas about how to solve student learning problems, thought that the use of data on a weekly basis enabled them to support students in real time, and got helpful ideas about student-teacher relationships from the team.

In addition, 89% of teachers reported feeling less isolated, learning new ideas from other teachers on how to solve student problems, had higher morale at school, felt a sense of shared as opposed to sole responsibility for students with behavior problems, felt they had a team supporting them when a student was in real trouble, and had stronger bonds with other teachers.

Responses were analyzed by years of teaching. There were no significant differences in ratings of the BARR model by years of teaching. Responses of new teachers (those teaching 1 to 2 years) were not significantly different from responses of veteran teachers (those teaching 16 or more years).

Responses were also analyzed according to whether schools in this grant period achieved implementation fidelity using the quality assessment measure. Schools that met

implementation fidelity were combined (Schools A and B, n=18 teachers) and compared with the school that did not meet implementation fidelity (School C, n=18 teachers). Teachers in schools that achieved implementation fidelity rated all six program-related questions significantly higher than did teachers in the school that did not meet implementation fidelity. Specifically, these questions included: use of I Time improved relationships with students, use of data enabled teachers to support students in real time, training in the developmental assets has improved teacher perception of student strengths, referral to Risk Review enabled teacher to focus more effectively on all of their students, use of Block Meeting has increased openness and effectiveness of communication between teachers and administrators, and educational technical assistance has increased their effectiveness (p values for these items ranged from 0.013 to 0.001 when testing group differences).

This pattern of teacher self-report on BARR strategies was consistent with evaluator observation of the quality of BARR implementation. Evaluator observation of quality and teacher self-report helped to provide differential assessment of schools that implemented BARR with fidelity and those that did not.

Chapter V - Impact Study: BARR in 2 Rural Schools

The BARR Model was implemented in two small rural high schools in Maine. Results indicated that School B, that implemented BARR with fidelity, had student core course failure rates that continued to decline and scores on the NWEA mathematics and reading tests that continued to increase.

An RCT was attempted in the larger of the rural schools (School C). However, contamination of the BARR strategies and practices became an issue, and the RCT was discontinued prior to the end of the first grading period. The school continued to receive services and we tracked implementation fidelity and student outcomes. After three years, School C did not reach implementation fidelity, student core course failure rates did not improve, and problems in NWEA test administration made test scores difficult to interpret.

High School B

School B is a small rural high school on the coast of northern Maine with a total enrollment of 302 students in grades 9-12. School B has 30 full-time teachers and 2 administrators, 34% of students are eligible for free or reduced lunch, and 96% are Caucasian.

School B has shown increasing fidelity of implementation over the three years of the BARR program, resulting in a final combined quality observation score of 90%. Over the past three years, School B has shown growth in the student academic outcomes of credits earned in core courses during the freshman year and in performance on the NWEA standardized tests.

Core Course Credits

Table 4 presents the average number of core course credits earned at the end of freshman year, number of failed core classes, failure rate as defined by the number of students with at least one failure in a core course, and Grade Point Average (GPA) for three cohorts of freshman classes in school years 2011 – 2014.

Table 4. Core Course Credits

Year	Number of students	Average number of credits earned*	Number of failed core courses	Percent of students with at least one failure in a core course	Average GPA in core courses
Year 1	78	3.51 (92.6%)	22	16.7%	82.17
Year 2	62	3.97 (87.0%)	31	18.0%	83.60
Year 3	69	3.81 (95.3%)	13	11.6%	85.65

*Average number of attempted credits was 3.79 in Year 1, 4.56 in Year 2, and 4.00 in Year 3.

During the three years of BARR implementation in the freshman year:

- Percentage of core credits earned increased from 92.6% to 95.3%
- Number of failed core courses decreased by 41% (from 22 to 13)
- Failure rate decreased by 31% (from 16.7% to 11.6%)
- Average GPA improved steadily from 82% to 86%

These results demonstrate that the implementation of the BARR model positively affected 9th grade student achievement over time at School B and that these improvements have been sustained.

Northwest Education Association (NWEA) Mathematics, Reading, and Language Scores

A second measure of academic progress was achievement scores on NWEA standardized tests of reading, mathematics, and language administered in fall and spring to all 9th grade students each year.

In the first year of BARR implementation, School B students scored below the national average in reading (8th grade equivalent in fall and spring). In years 2 and 3, School B students scored above the national average, and by year 3, School B students were scoring greater than 11th grade equivalent in both fall and spring (n=71 students in year 1, n=47 students in year 2, and n=64 students in year 3). Figure 14 presents these results.

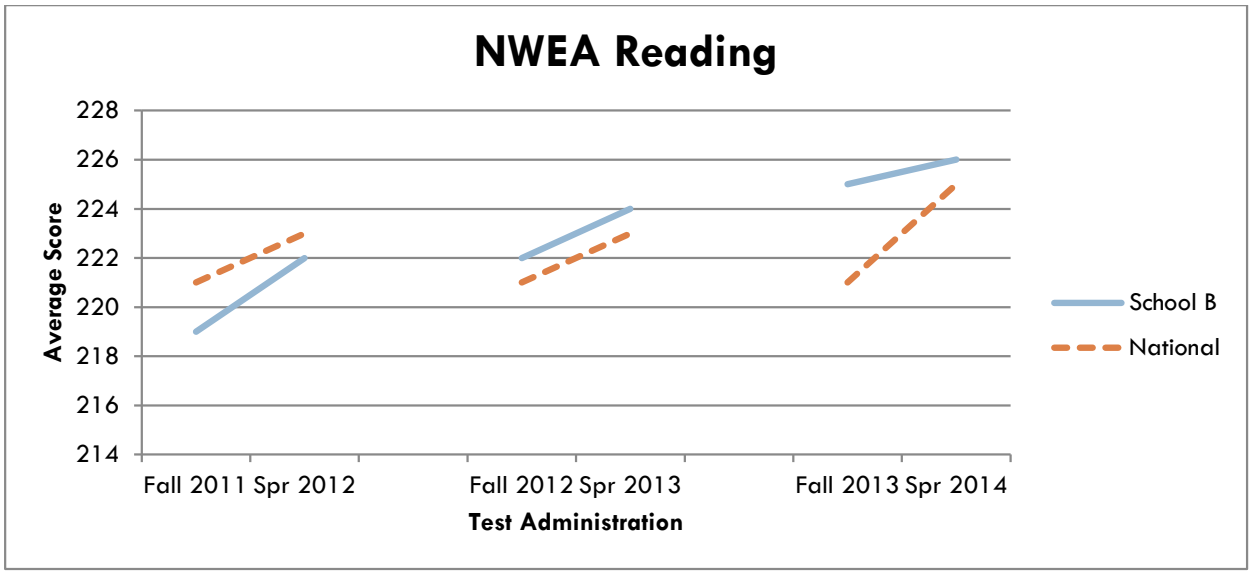


Figure 14. Growth in NWEA Reading scores by year as compared to national average

In year 1, School B students were well below the national average in mathematics (scoring at grade 7.5 in both fall and spring). This gap closed by spring of 2013 when School B students scored at the national average for 9th grade. In year 3, students scored at a grade 8.5 equivalent. Overall, performance in mathematics was weaker than in reading and language, but progress is, nonetheless, evident. By year 3, School B students were 0.5 years behind the national average compared to 1.5 years in the first year of the BARR model (n=74 students in year 1, n=48 students in year 2, and n=65 students in year 3). Figure 15 presents these results.

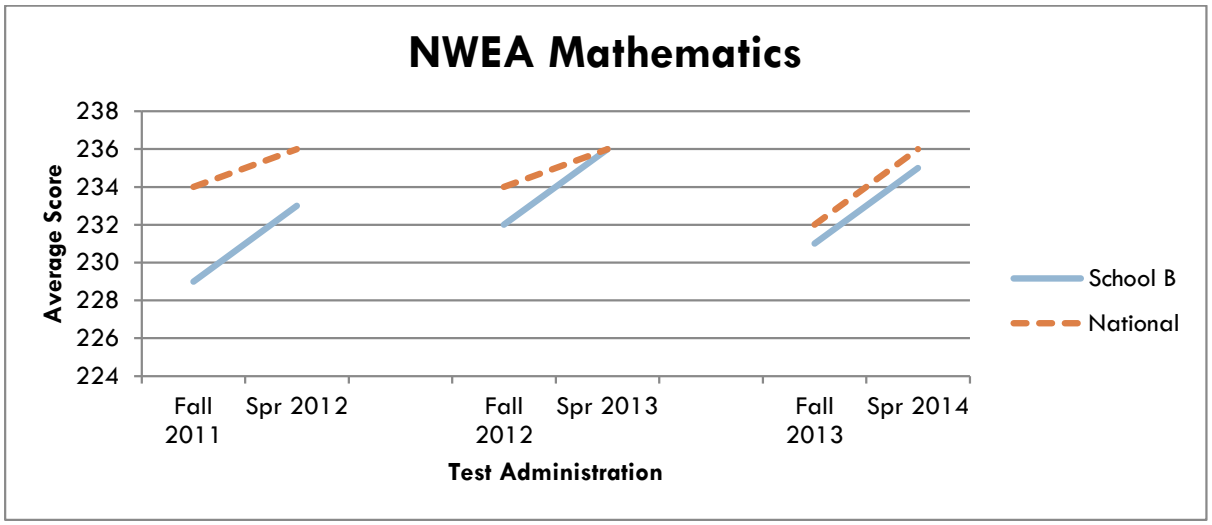


Figure 15. Growth in NWEA Mathematics scores by year as compared to national average

In Years 2 and 3, School B students took the NWEA language test, in addition to reading and mathematics. In the fall of year 2, School B students scored at the national average and in spring of year 1 and the following year, they scored greater than 11th grade equivalent (n=45 students in year 2 and n=67 students in year 3). Figure 16 presents these results.

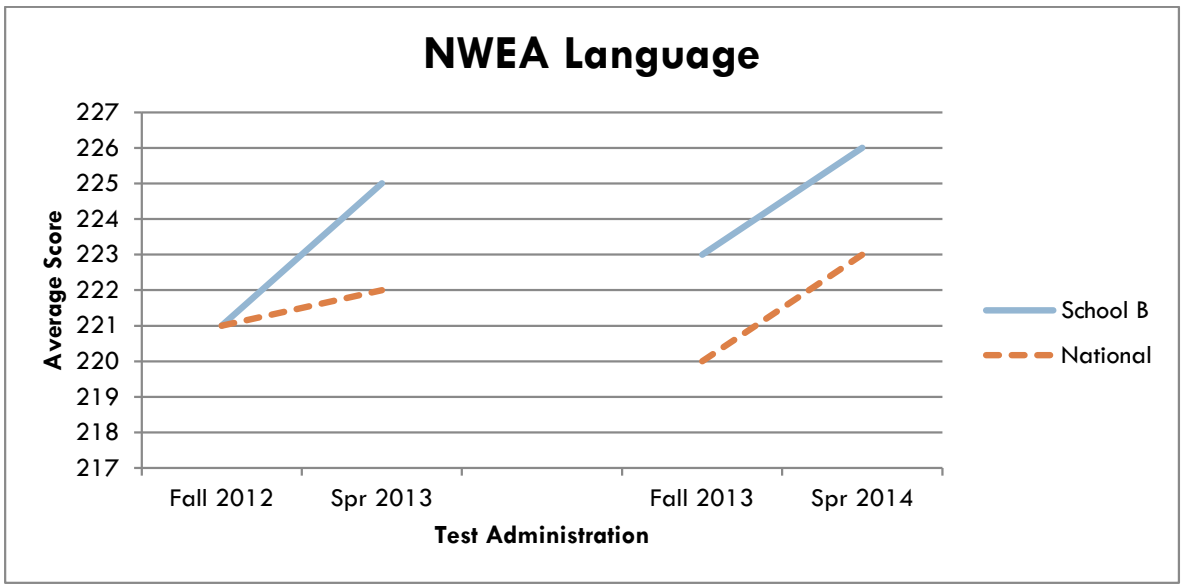


Figure 16. Growth in NWEA Language scores by year as compared to national average

Table 5 shows that freshmen students at School B increased their performance on NWEA reading tests by three grade levels (grade 8 to 11+), and on language tests by two grade levels from 2011 to 2014. In mathematics, School B students gained one grade level from the first to third years of the grant.

Table 5. Grade Equivalents for NWEA Scores by Year

	Reading		Mathematics		Language	
	Fall	Spring	Fall	Spring	Fall	Spring
Year 1	8	8	7.5	7.5	N/A	N/A
Year 2	9.5	11+	8.5	9	9	11+
Year 3	11+	11+	8.5	8.5	11+	11+

High School C

School C is a rural high school in southern Maine with a total enrollment of 1,018 students in grades 9-12. School B has 78 full-time teachers and 5 administrators, 44% of students are eligible for free or reduced lunch, and 95% are Caucasian.

As mentioned previously, School C attempted an RCT. However, because of contamination of BARR strategies and practices across BARR and non-BARR groups the study was discontinued prior to end of the first marking period. After that, the original BARR group continued to receive technical assistance which was then shared by the site coordinator and counselor with the non-BARR group. After three years, many problems still remained in the degree to which School C implemented the BARR Model. Student outcomes indicated no improvement in core course failure rate and uneven performance on NWEA tests of reading and mathematics, sometimes due to problems in test administration.

Core Course Credits

Table 6 below presents the average number of core course credits earned at the end of freshman year, number of failed core classes, failure rate as defined by the number of students with at least one failure in a core course, and Grade Point Average (GPA) for three cohorts of freshman classes in school years 2011 – 2014.

Table 6. Core Course Credits

Year	Number of students	Average number of credits earned*	Number of failed core courses	Percent of students with at least one failure in a core course	Average GPA in core courses
Year 1	220	4.40 (89.2%)	117	26.8%	83.2
Year 2	238	4.05 (83.0%)	160	33.6%	79.6
Year 3	223	3.96 (83.4%)	176	33.2%	80.9

* Average number of attempted credits was 4.93 in year 1, 4.89 in year 2, and 4.75 in year 3.

During the three years of BARR implementation in the freshman year:

- Percentage of core credits earned decreased from 89.2% to 83.4%
- Number of failed core courses increased by 50% (from 117 to 176)
- Failure rate increased by 24% (from 26.8% to 33.2%)

- Average GPA decreased from 83.2% to 80.9%

These results demonstrate an overall negative trend in student academic outcomes.

Northwest Education Association (NWEA) Mathematics, Reading, and Language Scores

A second measure of academic progress was achievement scores on NWEA standardized tests of reading, mathematics, and language administered in fall and spring to all 9th grade students each year. Figure 17 presents the results for NWEA reading scores. Results were variable from year to year, but the trend over 3 years shows a decline from a high of 11+ grade equivalent in year 1 to just below 9th grade equivalent in year 3. Of note is that 80% of students took the test in year 1, 89% of students in year 2, and 92% of students in year 3.

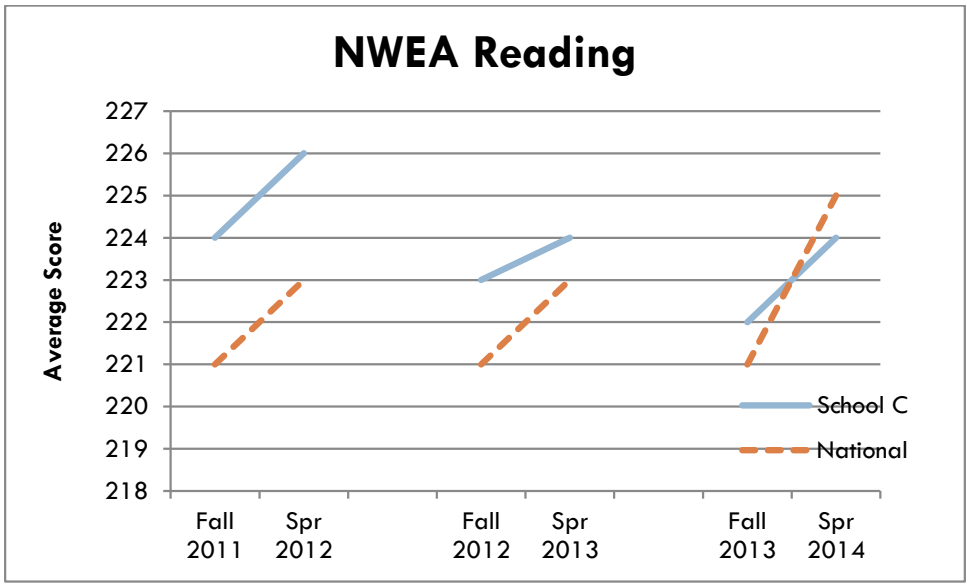


Figure 17. Growth in NWEA Reading scores by year as compared to national average

In terms of performance in mathematics, students scored at the 9th grade national average in mathematics in the fall of year 1, and improved two grade levels in the spring of that year to score at 11th grade equivalent. A total of 95% of students completed both fall and spring tests. However, in year 2, only 27% of the freshman class completed both tests, and in year 3, only 55% completed these tests. Given the much reduced sample sizes in years 2 and 3, these results could not be generalized to the entire 9th grade class.

In year 3, 93% of students took the NWEA language test. School C students scored one half year above the national average in the fall and one year above the national average in the spring.

Throughout the three years, BARR implementation was problematic and provided many challenges. Administrators failed to engage fully in the process, the site coordinator and teachers did not use technical assistance suggestions to improve performance, and even as late as the third year, a negative school climate made it increasingly difficult to create change.

Because of these challenges, School C provides an excellent opportunity to better understand barriers to successful implementation of the BARR model. School C had several large school initiatives that were being implemented at the same time that included another major grant and a high school construction project. In addition, key administrators in the high school changed during the BARR grant and were not as fully involved in implementing and supporting the BARR model as were administrators in the other schools. The evaluators noted a lack of engagement in the program through informal observations of faculty, students, and administrators. Technical assistance providers reported that recommendations to improve the program were often not implemented, despite repeated attempts.

Chapter VI - Conclusions

The results of this RCT demonstrated that students in the BARR experimental group earned significantly more credits in core classes and achieved significantly more growth from fall to spring in NWEA mathematics and reading tests when compared to students in the non-BARR group. After the RCT was over, academic performance in the entire 9th grade continued to increase in years 2 and 3. A significant achievement gap between Hispanic and non-Hispanic students was evident in year 1, and then closed in years 2 and 3 to reveal no significant difference between Hispanic and non-Hispanic students in core course failure rate.

Another important finding was the association between the quality of implementation and student outcomes. The school that did not show changes in student failure rate and performance on standardized tests did not have adequate implementation quality ratings, while schools that implemented BARR with fidelity showed notable and sustained improvements in both academic measures.

From a scientific perspective, these results are notable given the use of a within-school student-level randomized controlled design, which is relatively rare in educational research. This design requires support from school administration, cooperation from teachers, and a high level of commitment by all involved. This commitment by the school enabled us to test causal outcomes of the BARR model. As part of a review process for an i3 Validation grant, the results from the RCT year were reviewed by What Works Clearinghouse and met their criteria for an evidence-based program without reservations.

The findings described in this report are consistent with the results of other successful 9th grade transition programs. The current study extends the literature by demonstrating a two-year growth in standardized mathematics test scores, and by employing a within-school randomized controlled design. The BARR model demonstrated that relationship building focused on non-cognitive social/emotional supports, combined with rigorous academic standards and close attention to student performance produced higher academic achievement for students transitioning into high school.

Research demonstrates that positive school climate, positive relationships between students and staff, and among staff, are essential ingredients for turning around low performing schools. Research is growing on the effectiveness of student-teacher relationships in producing increased attendance and academic performance, and decreased behavior problems. With core components derived from research, the Building Assets Reducing Risks (BARR) model© targets students at this critical juncture in their academic career—9th grade.

BARR addresses the developmental, academic, and structural challenges of the 9th grade by combining student asset building, teachers' real-time analysis of student data, and intensive teacher collaboration to prevent course failure. BARR develops positive student-teacher relationships and integrates student supports into a school's existing model for addressing non-academic barriers to learning. Given the importance of a successful transition to high school and of forming positive school relationships, these statistically significant findings that BARR impacts students' academic achievement and socio-emotional development, suggest deeper exploration of this model is warranted. BARR is the "system" for operationalizing key relationship theory and practice. It demonstrates how BARR, as a relationship-focused model, leads to continued engagement and increased academic performance for students that come to school already connected, and helps those students who have lost that connection to re-engage.

As in any study, several limitations need to be considered. For example, BARR teachers may have shared new strategies and techniques with other teachers and non-BARR students may have benefited from subtle changes in school climate resulting from the adoption of this strength based approach. If these events had occurred, although good for educational reform, they may have diminished the statistically significant differences between BARR and non-BARR students. Further testing of the BARR model in other schools will assess the external validity of these findings.

In terms of future directions, BARR was awarded the U. S. Department of Education Investing in Innovation Validation grant: *Building Assets Reducing Risks: A Proven Strategy to Increase Student Achievement by Improving Teacher Effectiveness* in 2013. The grant will test the model in 11 RCT schools across the country, and provide materials and training to an additional 45 schools. The project is designed so that 51% of participants will be from rural areas. The outcome measures will include credits earned in the core subjects, growth in NWEA mathematics and reading Scores, and more documentation of student and teacher experiences in the BARR Model.

BARR is a comprehensive model that addresses the challenges that are part of the 9th grade transition year. It is unique in that it is a socio-emotional model that produces significant academic results. The model provides the support that students need to be successful in their transition to high school and sets them on a positive trajectory toward graduation and beyond. Two quotes from superintendents capture the real world significance of the BARR model:

"I know that if students are on track in the 9th grade, their chances for graduating on time are significantly enhanced." (Rob Metz, Superintendent, St. Louis Park School District, MN

"We're finding that students have better daily attendance and are staying in school instead of dropping out. Equally important, there's support for teachers from BARR educators, who are using in-situation coaching, quarterly site-to-site visits, and technology enabled learning opportunities to assist them. We're creating positive, intentional relationships, and using real-time student data in a collaborative problem solving process to meet the individual needs of all students." (Jim Boothby, Superintendent of schools, Regional School Unit 25).

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Appendices - Tables

Appendix A

Table 1a. Attrition for Credits Earned in Core Courses

Attrition Rate for Confirmatory Contrast Based on the 2011-12 School Year: Outcome = Credits Earned in Core Courses			
	BARR Group	**Non-BARR Group**	
Assigned sample	278	277	
Analytic sample	272	276	
Attrition rate	2.2%	0.4%	
Overall attrition			1.3%
Differential attrition rate			1.8%

Table 1b. Attrition for NWEA Reading

Attrition Rate for Exploratory Contrast Based on the 2011-12 School Year: Outcome = NWEA Reading Score			
	BARR Group	**Non-BARR Group**	
Assigned sample	278	277	
Analytic sample	261	234	
Attrition rate	6.1%	15.5%	
Overall attrition			10.8%
Differential attrition rate			9.4%

Table 1c. Attrition for NWEA Mathematics

Attrition Rate for Exploratory Contrast Based on the 2011-12 School Year: Outcome = NWEA Mathematics Score			
	BARR Group	**Non-BARR Group**	
Assigned sample	278	277	
Analytic sample	252	231	
Attrition rate	9.4%	16.7%	
Overall attrition			8.7%
Differential attrition rate			7.3%

Appendix B

Table 2. Baseline Measurement – Group Data

	Size of Intervention Group	Mean of Intervention Group	St. Dev. of Intervention Group	Size of Comparison Group	Mean of Comparison Group	St. Dev. of Comparison Group
Total Credits	N/A	N/A	N/A	N/A	N/A	N/A
LP - Credits	170	216.482	9.166	148	215.041	11.748
MP-Credits	100	233.4	7.463	103	232.65	6.282
Total Read	261	223.13	11.659	234	222.556	12.831
LP - Read	162	216.809	8.921	135	215.126	11.29
MP - Read	99	233.475	7.463	99	232.687	6.117
Total Math	252	230.286	14.264	230	230.5	14.42
LP- Math	154	221.545	9.516	135	222.111	11.522
MP- Math	98	244.02	8.471	95	242.421	8.522

LP= Less Proficient; MP = More Proficient; Total Read= NWEA Reading scores; Total Math = NWEA Math scores

Appendix C

Mean number of core credits and NWEA scores by Study group, Gender, and Hispanic origin

Table 3a. Mean number of core credits and NWEA scores by Study Group

Study Group	N	Core Credits	Fall Math	Spring Math	Fall Reading	Spring Reading
BARR	270	5.65	230.063	236.509	222.915	227.429
Non-BARR	251	5.39	230.886	232.021	222.795	225.491

Table 3b. Mean number of core credits and NWEA scores by Gender

Study Group	Gender	N	Core Credits	Fall Math	Spring Math	Fall Reading	Spring Reading
BARR	Females	146	5.68	228.304	233.971	222.539	226.681
	Males	124	5.62	232.75	240.304	223.825	228.842
Non-BARR	Females	135	5.53	228.22	229.902	223.449	226.819
	Males	116	5.24	233.529	233.843	221.495	223.318

Table 3c. Mean number of core credits and NWEA scores by Hispanic origin

Study Group	Ancestry	N	Core Credits	Fall Math	Spring Math	Fall Reading	Spring Reading
BARR	Non-Hispanic	182	5.78	231.512	238.738	224.534	229.421
	Hispanic	88	5.39	227.615	232.551	220.12	223.928
Non-BARR	Non-Hispanic	148	5.49	233.478	234.836	224.964	227.791
	Hispanic	103	5.26	226.429	227.005	219.032	221.453

Appendix D

Table 4a. Regression predicting core credits earned

Parameter Estimates

Parameter	Beta	Std. Error	*t*	*p*-Value
Study Group	0.230	0.082	2.793	0.005
Gender	0.143	0.082	-1.742	0.082
Hispanic Origin	0.161	0.087	-1.853	0.064
Fall Reading	0.028	0.003	8.369	0.000

Table 4b. Regression predicting Spring NWEA scores in Mathematics

Parameter Estimates

Parameter	Beta	Std. Error	*t*	*p*-Value
Study Group	5.260	0.710	7.410	0.000
Fall Math	0.026	0.025	36.789	0.000
Gender	0.693	0.720	0.963	0.336
Hispanic Origin	-1.871	0.754	-2.842	0.013

Table 4c. Regression predicting Spring NWEA scores in Reading

Parameter Estimates

Parameter	Beta	Std. Error	*t*	*p*-Value
Study Group	1.841	0.638	2.886	0.004
Fall Reading	0.802	0.027	30.209	0.000
Gender	-0.284	0.637	-0.446	0.656
Hispanic Origin	-1.763	0.678	-2.601	0.010

Appendix E

Table 5a. Reported Findings – Group Data

	Unadjusted Mean of Intervention Group	Unadjusted St. Dev. of Intervention Group	Mean of Comparison Group	St. Dev. of Comparison Group
Total Credits	5.652	0.807	5.394	1.187
LP - Credits	5.518	0.931	5.149	1.367
MP-Credits	5.88	0.456	5.748	0.737
Total Read	227.674	11.51	225.218	12.998
LP - Read	222.333	9.335	218.415	11.634
MP - Read	236.414	9.164	234.495	8.118
Total Math	236.782	16.105	231.609	15.168
LP- Math	227.617	10.515	223.548	11.787
MP- Math	251.184	12.403	243.063	11.684

LP= Less Proficient; MP = More Proficient; Total Read= NWEA Reading scores; Total Math = NWEA Math scores

Table 5b. Reported Findings – Estimates

	Impact Estimate	Std. Error of Impact Estimate	Two-tailed p-value	Degrees of Freedom
Total Credits	0.23	0.082	0.005	516
LP - Credits	0.288	0.123	0.02	313
MP-Credits	0.124	0.087	0.157	198
Total Read	1.841	0.638	0.004	490
LP - Read	2.486	0.873	0.005	292
MP - Read	1.199	0.91	0.189	193
Total Math	5.212	0.696	0.001	477
LP- Math	4.235	0.895	0.001	284
MP- Math	6.24	1.029	0.001	188

LP= Less Proficient; MP = More Proficient; Total Read= NWEA Reading scores; Total Math = NWEA Math scores

Appendix F

Table 6a. OLS Regression predicting core credits earned – Less Proficient group

Effect	Coefficient	Standard Error	Std. Coefficient	Tolerance	*t*	*p*-Value
CONSTANT	-2.141	1.292	0.000	.	-1.657	0.098
1=Experimental, 0=Non-BARR	0.288	0.123	0.123	0.984	2.345	0.020
Gender	-0.190	0.124	-0.081	0.978	-1.534	0.126
Student is Latino (of Hispanic Ethnic Ancestry)	-0.208	0.124	-0.089	0.976	-1.680	0.094
Fall NWEA Reading	0.035	0.006	0.312	0.968	5.877	0.000

Table 6b. OLS Regression predicting core credits earned – More Proficient group

Effect	Coefficient	Standard Error	Std. Coefficient	Tolerance	*t*	*p*-Value
CONSTANT	3.895	1.478	0.000	.	2.635	0.009
1=Experimental, 0=Non-BARR	0.124	0.087	0.101	0.986	1.421	0.157
Gender	-0.026	0.087	-0.021	0.993	-0.294	0.769
Student is Latino (of Hispanic Ethnic Ancestry)	-0.063	0.100	-0.045	0.987	-0.633	0.527
Fall NWEA Reading	0.008	0.006	0.090	0.990	1.278	0.203

Table 6c. OLS Regression predicting Spring NWEA Reading – Less Proficient group

Effect	Coefficient	Standard Error	Std. Coefficient	Tolerance	*t*	*p*-Value
CONSTANT	67.051	9.518	0.000	.	7.045	0.000
1=Experimental, 0=Non-BARR	2.486	0.873	0.117	0.983	2.846	0.005
Gender	-0.461	0.882	-0.022	0.979	-0.523	0.601
Student is Latino (of Hispanic Ethnic Ancestry)	-2.091	0.884	-0.098	0.970	-2.365	0.019
Fall NWEA Reading	0.709	0.044	0.674	0.965	16.261	0.000

Table 6d. OLS Regression predicting Spring NWEA Reading – More Proficient group

Effect	Coefficient	Standard Error	Std. Coefficient	Tolerance	*t*	*p*-Value
CONSTANT	33.982	15.550	0.000	.	2.185	0.030
1=Experimental, 0=Non-BARR	1.199	0.910	0.069	0.984	1.317	0.189
Gender	-0.428	0.906	-0.025	0.993	-0.473	0.637
Student is Latino (of Hispanic Ethnic Ancestry)	-0.868	1.045	-0.044	0.987	-0.830	0.407
Fall NWEA Reading	0.864	0.067	0.678	0.993	12.967	0.000

Table 6e. OLS Regression predicting Spring NWEA Mathematics – Less Proficient group

Effect	Coefficient	Standard Error	Std. Coefficient	Tolerance	*t*	*p*-Value
CONSTANT	57.138	9.588	0.000	.	5.960	0.000
1=Experimental, 0=Non-BARR	4.235	0.895	0.187	0.982	4.731	0.000
Gender	0.840	0.916	0.037	0.959	0.917	0.360
Student is Latino (of Hispanic Ethnic Ancestry)	-2.866	0.905	-0.126	0.973	-3.168	0.002
Fall NWEA Reading	0.754	0.043	0.700	0.961	17.484	0.000

Table 6f. OLS Regression predicting Spring NWEA Mathematics – More Proficient group

Effect	Coefficient	Standard Error	Std. Coefficient	Tolerance	*t*	*p*-Value
CONSTANT	-35.535	14.762	0.000	.	-2.407	0.017
1=Experimental, 0=Non-BARR	6.240	1.029	0.246	0.982	6.061	0.000
Gender	0.435	1.035	0.017	0.970	0.420	0.675
Student is Latino (of Hispanic Ethnic Ancestry)	-0.094	1.192	-0.003	0.994	-0.078	0.938
Fall NWEA Reading	1.149	0.061	0.770	0.969	18.822	0.000

Appendix G

Table 7a. Core Course Credits by Gender Over 3 Years

Year	Gender	Number of students	Average number of core credits earned	Number of failed core courses	Percent of students with at least one failure in a core course	Average GPA in core courses
Year 1 Non-BARR	Girls	148	5.40 (90.0%)	79	26.4%	2.82
	Boys	128	5.11 (85.2%)	103	38.3%	2.51
Year 1 BARR	Girls	148	5.68 (94.7%)	43	19.6%	3.00
	Boys	124	5.62 (93.7%)	47	22.6%	2.80
Year 2	Girls	261	5.76 (96.0%)	63	12.3%	2.90
	Boys	256	5.50 (91.7%)	129	22.3%	2.51
Year 3	Girls	238	5.76 (96.1%)	55	10.5%	3.05
	Boys	293	5.39 (90.0%)	176	24.9%	2.53

Table 7b. Core Course Credits by Hispanic Origin Over 3 Years

Year	Ethnicity	Number of students	Average number of core credits earned	Number of failed core courses	Percent of students with at least one failure in a core course	Average GPA in core courses
Year 1 Non-BARR	Non-Hispanic	163	5.37 (89.5%)	92	25.2%	2.83
	Hispanic	113	5.11 (85.2%)	90	41.6%	2.44
Year 1 BARR	Non-Hispanic	182	5.78 (96.3%)	40	15.9%	3.00
	Hispanic	90	5.40 (90.0%)	50	31.1%	2.73
Year 2	Non-Hispanic	300	5.63 (93.8%)	110	16.3%	2.82
	Hispanic	217	5.62 (93.7%)	82	18.4%	2.54
Year 3	Non-Hispanic	298	5.58 (93.0%)	126	16.4%	2.77
	Hispanic	232	5.55 (92.5%)	105	21.1%	2.75

Appendix H

Fidelity Ratings for Key Components of the BARR Program for Years 1 and 2

			Findings 2011 - 2012 Year		Findings 2012 -2013 Year	
Key Components on Logic Model	Definition of High Implementation	Definition of "implementation with fidelity" at program level	% of schools at high level of implementation*	"Implementation with fidelity" for year**	% of schools at high level of implementation*	"Implementation with fidelity" for year**
Professional Development	Rating of 7 out of 9 based on 4 objectives	At least 66% of schools are high	33%	No	100%	Yes
Restructuring	Rating 7 out of 9 based on 6 objectives	At least 66% of schools are high	100%	Yes	100%	Yes
Parent Involvement	Rating of 7 out of 9 based on 4 objectives	At least 66% of schools are high	33%	No	66%	Yes
Developmental Assets Curriculum	Rating 7 out of 9 based on 3 objectives	At least 66% of schools are high	66%	Yes	100%	Yes
Block Meeting Review	Rating of 7 out of 9 based on 4 objectives	At least 66% of schools are high	100%	Yes	100%	Yes
Risk Review	Rating of 7 out of 9 based on 5 objectives	At least 66% of schools are high	100%	Yes	100%	Yes
Whole Student Emphasis	Rating of 7 out of 9 based on 7 objectives	At least 66% of schools are high	100%	Yes	100%	Yes
Contextual Support	Rating of 7 out of 9 based on 4 objectives	At least 66% of schools are high	100%	Yes	100%	Yes
Overall Fidelity to BARR Program	Summary score of 56 based on 8 key components	At least 66% of schools are high	100%	Yes	100%	Yes

**Based on data collection during school year, **Calculated based on % in definition*

Appendix I

BARR Teacher Survey

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
1. The use of I-Time has improved my relationships with students	6.4%	8.5%	8.5%	**61.7%**	14.9%
2. The use of data on a weekly basis enables me to support students in real time	4.3%	0%	4.3%	42.6%	**48.8%**
3. Training in the developmental asset approach has improved my perception of student strengths	4.3%	8.5%	14.9%	**61.7%**	10.6%
4. Referral to the risk and asset review team of my highest need students has enables me to focus more effectively on all of my students	4.3%	21.9%	10.0%	**36.2%**	27.6%
5. The use of the BARR block meeting process has increased the openness and effectiveness of communication between teachers and administrators	6.4%	6.4%	6.4%	21.3%	**59.5%**
6. Educator technical assistance visits from other teachers who are implementing BARR has increased my effectiveness	4.3%	6.4%	**44.7%**	34.0%	10.6%

[1] Table reports all teachers across the BARR project's responses by rating. Reponses are reported as percentages.

What participating in a BARR Block Team Meeting means to me…	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
1. I like the opportunity to share ideas about how to solve student learning problems	2.1%	2.1%	2.1%	44.7%	**49.0%**
2. I feel a little less isolated because I am a member of a block team	4.4%	0%	6.5%	30.4%	**58.7%**
3. I feel proud of our team's accomplishments for students	2.1%	2.1%	2.1%	34.0%	**59.7%**
4. I get helpful ideas about teacher-student relationships for the team	2.1%	0%	6.4%	34.0%	**57.5%**
5. Participating in a team has increased my satisfaction with being a teacher	4.3%	2.1%	8.5%	36.2%	**48.9%**
6. On our team we have come up with new ideas on how to change the school to improve student progress	6.4%	2.1%	10.6%	**49.0%**	31.9%
7. I have learned new ideas from other teachers about how to help students with behavior problems	2.1%	0%	8.5%	**55.3%**	34.1%
8. Being a team member has raised my morale at school	2.1%	2.1%	6.4%	36.2%	**53.2%**
9. I have a sense of satisfaction from being able to help other teachers solve student problems	4.3%	0%	8.5%	**44.7%**	42.5%
10. In some ways, being a block team member helps protect me from "teacher burnout"	8.5%	6.4%	10.6%	**40.4%**	34.1%
11. My team gives me a sense of shared rather than sole responsibility for students with behavior problems	2.1%	2.1%	6.4%	36.2%	**53.2%**
12. When a student is in real trouble, I feel like I have a team supporting me	2.1%	4.3%	4.3%	36.2%	**53.2%**
13. Participating on a team has strengthened my bonds with other teachers	2.1%	0%	8.5%	27.7%	**61.7%**