

Afterschool Mathematics Support Program

Report to the Legislature



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Executive Summary

Second Substitute House Bill (SSHB) 1906 (2007 Session) created the Afterschool Mathematics Support Program. The purpose of the afterschool mathematics support program was to study the effects of intentional, skilled mathematics support included as part of an existing afterschool program. A total of five pilot project grants were awarded to community-based nonprofit organizations to provide afterschool mathematics support programs. This report contains the findings from the evaluation of these pilot project grants and provides recommendations related to program continuation, program modification, and issues related to program sustainability and possible program expansion.

Following a Request for Proposal (RFP) grant process, five community-based organizations (CBO) were each awarded \$74,000 grants for the integration of an afterschool mathematics support program. Priority was given to applicants that proposed programs to serve middle school and junior high school students.

The Office of Superintendent of Public Instruction (OSPI) awarded five distinct CBOs: Communities in Schools, Lakewood; Communities in Schools in Seattle; Rotary Boys and Girls Club in Seattle; Refugee Women’s Alliance (ReWA) in Seattle; and Washington Alliance for Better Schools in Kent. As required by law, these CBOs proposed programs that addressed the following criteria:

- (a) Identifying the mathematics content and instructional skill of the staff or volunteers assisting students (Staffing).
- (b) Identifying proposed learning strategies to be used, which could include computer-based instructional and skill practice programs and tutoring by adults or other students (Instructional Program).
- (c) Articulating the plan for connection with school mathematics teachers to coordinate student assistance (Coordination).
- (d) Articulating the plan for assessing student and program success (Assessment).

Each CBO proposed a unique approach to staffing, instructional programming, coordination, and assessment. While each of these programs began with a clear plan for their program, it turned out to be more difficult to integrate a math program into the noncompulsory afterschool program space. Following is a summary of the findings and descriptions of the unique approaches these programs took to provide a quality afterschool math support service.

Summary of Findings

Staffing – Teacher competence for these programs included:

(1) understanding the organization, (2) capacity to develop authentic relationships with students, (3) math content pedagogy, (4) high expectations for student achievement, and (5) cultural competence. Programs that emphasized highly competent teachers, in all five areas, tended to have higher participation rates. In the most engaging programs, as defined by consistent attendance, instructors were not necessarily certified teachers.

Instructional Program – Similar to school day math programs, there was no consensus on what effective math instruction entails. Each program had a different theory of math teaching and learning with a different instructional plan:

- Direct instruction in basic skills identified on a diagnostic assessment.
- Enrichment using similar concepts as the school day math units.
- Applied units of instruction loosely connected to school day units.
- Computer-based skill and drill.
- Combination of math games and school day unit tests.

Coordination – The partnership between the school and the CBO can be productively configured in multiple ways. Key elements of productive partnerships included: (a) Principal and CBO coordinator interaction, (b) effective teachers, and (c) a program that engages students and their families.

Homework help became the default for coordination between the school day program and the afterschool program. Homework help takes little or no time for planning and little relational trust between school day teachers and afterschool instructors.

Each program struggled to identify how to secure the parent involvement they wanted.

Student Assessment – Each CBO used a different measure of student learning than the schools. The CBO focus was mostly on student engagement as their measure of success while the schools wanted test scores as the measure of success.

Program Assessment – The duration of these pilot programs was too short and with too small a sample size to estimate statistical program effects. Therefore, program assessment needed to rely heavily on qualitative analysis that was informed by program descriptive level data.

Recommendations

Based on the independent evaluation of the afterschool math program conducted by Educational Service District 113. Several recommendations were identified. Of the eight recommendations, three major recommendations are highlighted below.

1. It is recommended that the state create the conditions for sustaining extended day learning as a statewide norm.

To achieve this goal, continue to fund pilot projects with the expectation that the programs will include an experimental or quasi-experimental design and a three year longitudinal design. This will provide a research base for Washington State to determine if these programs are effective for meeting the state's student learning goals. These pilot programs demonstrate that CBOs can coordinate afterschool programs with middle schools. What we still do not know is if it improves the learning outcomes of students. The grant did not require program size or duration to support a robust qualitative estimation of program effects. The requirements for robust experimental design should be built into the program design expectations.

2. It is recommended that community-based organizations and their partner schools combine the afterschool math program and teacher professional development in math instruction.

In the 2009–10 school year, more than half of the schools in Washington State will be in school improvement due to poor gains in math education. There is a pressing need for math teachers to improve their instructional tools to meet the new higher math standards. These pilot programs demonstrated that teachers can and do learn new instructional strategies during their work in afterschool programs. Afterschool programs are low stress and smaller learning communities that provide opportunities for teachers to try out new instructional practices. Teachers did report that they transferred the effective practices from the afterschool program into their school day programs. Teachers also reported that they gained a better understanding of their students' learning needs working with students after school. Combining teacher professional development and student extended learning opportunities is a logical approach to improving both school day math instruction and extending students' opportunities to learn math. The noncompulsory nature of the afterschool program requires that the teaching and learning experiences need to be engaging and powerful for both teachers and students. These pilot projects hint that these extended learning opportunities have the potential to improve math instruction.

3. It is recommended that the community-based organizations that receive funding for afterschool programs demonstrate a stable and functional relationship with partner schools. Additionally, these organizations should be expected to demonstrate stable relationships with students and their families in order to secure student and parent commitments to participate in their programs.

Securing participation in afterschool academic programs involves a concerted and continuous recruitment effort. Families and their students need to trust that the time spent in the afterschool program will be of benefit to the student. Many of the middle school students who are eligible for afterschool academic support are students who are already “disadvantaged by the school” and winning their trust is essential to the success of the program.

I. Introduction

Afterschool programs provide additional time for struggling students to gain much needed math skills. Quality afterschool programs provide engaging learning activities in a safe and supportive environment. Generally, programs that focus on middle school students are usually more recreation and sports focused. This is a time when many students experience a marked decrease in school engagement—grades falter, self-esteem, interest in school, and confidence in academic abilities declines. Afterschool programs help bridge the achievement gap by providing academic support that many parents are unable to provide to their children. The most important part is that quality afterschool programs partner with their local school districts and help students continue to build skills necessary for success in today's economy. The Afterschool Math Support Program is an example of such partnerships and provides students additional math intervention assistance.

A recommendation in the Washington Learns 2007 report is that the state should work with local community organizations and partnerships on student activities to reinforce mathematics and science concepts and skills. This report was foundational in creating the Afterschool Support Mathematics Support Program. As a result, the Office of Superintendent of Public Instruction (OSPI) was charged with the task to provide grants to community-based nonprofit organizations that demonstrate the capacity to provide assistance in mathematics learning, with priority for proposals to serve middle and junior high school students. OSPI was also required to evaluate the outcomes and make recommendations regarding continuation, modification, sustainability, and possible expansion.

II. Afterschool Mathematics Support Grant Process

From September 2007 to October 2007, OSPI staff developed grant criteria for the Afterschool Mathematics Support Program. This also included an informal search on what intentional effective best practices in math interventions were currently being offered in community-based afterschool programs. What we found was the majority of the programs offered homework help, but little linkages to the school day in math interventions.

In November 2007, a request for proposal was released through the OSPI iGrants system inviting nonprofits to respond to the application request with the following information:

1. Identification of the mathematics content and instructional skill of the staff or volunteers assisting students.
2. What learning strategies would be used.
3. A plan that clearly identifies:
 - The connection with school math teachers to coordinate student assistance.
 - How they will assess student and program success.

OSPI received a total of 11 grant applications from community-based nonprofit organizations requesting \$783,203 for the first year. Funding to OSPI for the complete project for both the 2008 and 2009 fiscal periods was a total of \$400,000.

A team of seven qualified people met to review the grant applications. After reading the proposals, the team discussed each application and then independently rated the proposals. Application scores were tallied and as a final step reviewer's comments were read by OSPI staff.

Upon initial review of the scoring results, most of the applicants had the majority of their funding allocated toward the infrastructure of the agencies, i.e., as directors' salaries, overhead, and rent. Given the direction by the state legislature that grants awarded were to go to existing afterschool organizations, OSPI felt that these costs were not appropriate expenditures and should already have been covered by the agency requesting funding. As a result, the decision was then made by OSPI to ask for additional information from the top five highest scoring applicants. Each applicant was advised that the mathematics program budget would be \$74,000 with the intent to fund the new math activities. Overhead costs such as directors' salaries and building rent were not allowed.

The Afterschool Mathematics Support Program was awarded in December 2007 to the top five rated proposals upon the review of the additional requested information. Each award was for \$74,000 and each project must serve a minimum of 50 students during the 18 month program.

A contract for evaluation services was awarded to the Educational Services District 113 to provide a full evaluation of this program. The findings and recommendations following in this report are from the evaluation of this project.

III. Findings

Evaluators conducted several focus group meetings with each program. The evaluators relied on community-based organizations (CBO) directors to invite and gather participants of their choice. Evaluators recommended that school principals and instructors participate. Focus groups lasted one hour, and the following questions were asked:

1. What have you learned from your afterschool math work this year?
2. What recommendations would you make to other organizations starting this work?
3. What difference did this work make for your students?

From these focus groups the following findings are:

1. Staffing – Teacher competence for these programs included: (1) understanding the organization, (2) capacity to develop authentic relationships with students, (3) math content pedagogy, (4) high expectations for student achievement, and, (5) cultural competence. Programs that emphasized highly competent teachers, in all five areas, tended to have higher participation rates. In the most engaging programs, with the most consistent attendance, instructors were not necessarily certified teachers.

2. Instructional Program – Similar to school day math programs, there was no consensus on what effective math instruction entails. Each program had a different theory of math teaching and learning with a different instructional plan:

- Direct instruction in basic skills identified on a diagnostic assessment.
- Enrichment using similar concepts as the school day math units.
- Applied units of instruction loosely connected to school day units.
- Computer-based skill and drill.
- Combination of math games and school day unit tests.

3A. Coordination – The partnership between the school and the CBO can be productively configured in multiple ways. Key elements of productive partnerships included (a) principal and CBO coordinator interaction, (b) effective teachers, and, (c) a program that engages students and their families.

3B. Coordination – Homework help became the default for coordination between the school day program and the afterschool program. Homework help takes little or no time for planning and little relational trust between school day teachers and afterschool instructors.

3C. Coordination – Each program struggled to identify how to secure the parent involvement they wanted.

4. Student Assessment – Community-based organizations have different measures of student learning than schools. CBOs focused on student engagement as their measure of success while schools wanted test scores as the measure of success.

5. Program Assessment – Pilot program designs were too short, with too small a sample size to estimate statistical program effects.

IV. Recommendations

1. It is recommended that the state create the conditions for sustaining extended day learning as a statewide norm.

To achieve this goal, continue to fund pilot projects with the expectation that the programs will include an experimental or quasi-experimental design and a three year longitudinal design. This will provide a research base for Washington State to determine if these programs are effective for meeting the state's student learning goals. These pilot programs demonstrate that CBOs can coordinate afterschool programs with middle schools. What we still do not know is if it improves the learning outcomes of students. The grant did not require program size or duration to support a robust qualitative estimation of program effects. The requirements for robust experimental design should be built into the program design expectations.

2. It is recommended that community-based organizations and their partner schools combine the afterschool math program and teacher professional development in math instruction.

In the 2009–10 school year, more than half of the schools in Washington State will be in school improvement due to poor gains in math education. There is a pressing need for math teachers to improve their instructional tools to meet the new higher math standards. These pilot programs demonstrated that teachers can and do learn new instructional strategies during their work in afterschool programs. Afterschool programs are low stress and smaller learning communities that provide opportunities for teachers to try out new instructional practices. Teachers did report that they transferred the effective practices from the afterschool program into their school day programs. Teachers also reported that they gained a better understanding of their students' learning needs working with students after school. Combining teacher professional development and student extended learning opportunities is a logical approach to improving both school day math instruction and extending students' opportunities to learn math. The noncompulsory nature of the afterschool program requires that the teaching and learning experiences need to be engaging and powerful for both teachers and students. These pilot projects hint that these extended learning opportunities have the potential to improve math instruction.

3. It is recommended that the Afterschool Math Programs continue to receive funding.

These programs offer an innovative approach to accelerating student achievement and advancing the partnerships and relationships between communities and schools for the purposes of improving teaching and learning and advancing extended day learning.

4. Longitudinal time greater than 18 months is needed to understand the impacts or values of these programs.

These CBOs each had the opportunity to run an afterschool program during the spring of 2008, a summer program during the summer of 2008, and a full year program during the 2008–09 school year. While it might be logical to think that the spring start up would have provided ample opportunity for the CBO and their school partners to sort out the details of running an afterschool program, it did not turn out that way. In almost every case, the spring program had little connection to the start of the full year program, either because staff changed or school expectations changed. The recommendation is to start these programs with the expectation that they will run them with sufficient support and funding for three years. Staff members can be more stable and program designs can include longer range expectations and goals including maintaining cohort enrollment over the full three years of a student's middle school experience.

Beyond the immediate participation in the program, there may be longitudinal impacts that are worth understanding and will require longer time periods to follow the partnerships and the students involved in the programs. It is critical that future work explore in greater depth comparisons across schools, student and teacher demographics, and across different program designs. For each of these programs there was definitely an initial planning phase that needed to be solidified. Having a funding scale with less start up dollars and more fiscal support later could be advantageous to monitoring and supporting costs. For future funding, consider research design requirements for randomized experiments, educational effects, and cost benefit analysis as a part of the program design. The program can be designed to produce the kind of statistical data that can be used to learn more about the educational effects of these partnerships.

5. Increase rigor of formative and summative data.

Afterschool programs need to start with measureable outcomes and measurement tools explicitly identified from the start. Robust assessment plans with clear goals, objectives, and outcomes are necessary or there will be little to no way of understanding if these programs make a difference for students. Currently, the most robust data is the attendance data. This is easy to collect. CBOs are not in the business of measuring student learning outcomes. The instruction in the afterschool program was either added onto the school day program as homework help or provided a completely different instructional experience which program staff was not able to measure in reliable or valid ways. It is a complicated process to measure student learning outcomes. If the purpose of this funding is to support students learning math, these programs can be expected to collect and use outcome data to determine if they are in fact supporting students in the learning of math. Schools are in the best position to require and recommend the use of assessment instruments, and, by having a regular feedback schedule, this could enhance communications.

6. It is recommended that community-based organizations and their partner schools explore opportunities to use afterschool math programs as teacher professional development to improve instruction for the school day program.

Turning CBO afterschool math programs (and summer school) into a rich professional learning opportunity for teachers to develop new competencies, practice new instructional strategies, try out new instructional materials, build one-on-one authentic relationships with students, and work through their understandings of some of the challenging content has proven to be highly effective in school districts that have merged afterschool (and summer) programs and professional development.

The new Standard 5, for pre-service teacher education programs, requires pre-service teacher candidates to participate in community-based organizations. These noncompulsory teaching and learning environments offer unique and important opportunities to explore student interests, student thinking, and what it really means to teach someone something, outside of the structures or rapid period changes and a student load of 125 students.

Partnerships with CBOs could be required to hire certified teachers with a math endorsement or working toward a math endorsement for the math program. This would create an additional safe space for teachers to try new practices outside of the contract day. For example, teachers interested in learning to work with small groups could invite a small group of students to participate in the afterschool program. Once one small group is working successfully, the teacher could add another small group of students to the class. This would allow the teacher to learn how to pace effective group instruction. Eventually, the teacher could add even add a third group. Throughout, the teacher is learning how to structure small groups within a large group, like a traditional classroom. These flexible student configurations are almost impossible to achieve during the regular school day. If the program is run through a community-based organization, teachers are free from school day contract expectations and may find it easier to try out new instructional strategies without concerns of summative evaluations.

Framing the opportunity to teach afterschool as a chance to earn a math endorsement or clock hours and improve their practice while they make extra money, may provide the right combination of incentives to improve math instruction throughout the system. Currently, school districts struggle to create sufficient circumstances for teacher professional development. By improving instructional skills in mathematics and increasing student learning, an optimal situation arises. State and school district interests are being met; while at the same time, the community desire for students to have multiple opportunities to be engaged and succeed in math are being addressed.

7. It is recommended that the community-based organizations that receive funding for afterschool programs demonstrate a stable and functional relationship with partner schools. Additionally, these organizations should be expected to demonstrate stable relationships with students and their families in order to secure student and parent commitments to participate in their programs.

Securing participation in afterschool academic programs involves a concerted and continuous recruitment effort. Families and their students need to trust that the time spent in the afterschool program will be of benefit to the student. Many of the middle school students who are eligible for afterschool academic support are students who are already “disadvantaged by the school” and winning their trust is essential to the success of the program.

8. It is recommended that the state create the conditions for sustaining extended day learning as a statewide norm.

Middle school students participate in a wide variety of activities after school. Some of these activities are pro-social and some are anti-social. Educators, parents, and community-based organizations share the common interest in creating pro-social afterschool activities. Research has shown that student success in math, particularly excellent and accelerated learning that produces the successful completion of algebra by the end of eighth grade, is a protective factor for students graduating from high school.

Supporting the transformation of low expectations for student math achievement to high expectations for math achievement is a high academic goal; most teachers and students need extra time in the school day to achieve this goal. In many school communities, the educators also need cultural resources- including language, family connections, and a nonpunitive and noncompulsory environment- in order to fully engage students in high levels of academic achievement.

The myth that middle school students are too distracted by their social lives to do rigorous academic work has been proven wrong in many schools that are serious about their academic expectations and supports for students meeting those expectations. For schools that have been unable to produce rigorous learning outcomes across their whole student population, extended day programs may be the transformative tool those schools need. The afterschool partnership with a CBO that expects a rigorous program and allows the teachers the freedom to try out a variety of instructional strategies, in order to find ways to produce high academic achievement, may be the perfect sandbox for improvements during the school day.

V. Conclusion

Having the community-based organizations provide the math instruction without additional training and support was a struggle for these grantees. Adding the math instruction alone also made it difficult to attract the students to attend this program. Afterschool programs that allow for a variety of activities (such as the 21st Century Community Learning Centers) with math as a major component, appear to show a better success rate than an afterschool program for math only.

It is recommended that the community-based organizations that receive funding for extended day partnerships demonstrate a stable and functional relationship with their partner schools. Additionally, these organizations should be expected to demonstrate stable relationships with students and their families in order to secure student and parent commitments to participate in their programs. If these qualities are not continuously demonstrated and discerned in the interactions between the community-based organization, the school staff, the students, and their families, trust is diminished as is the stability of the partnership. For example, if students come to participate in a program that they have been told will support them and they do not feel supported, they will not discern integrity or respect and they will not continue to attend, diminishing the stability of the partnership.

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