

Practices Worthy of Attention

Academic Youth Development Initiative

Summary of the Practice. The Academic Youth Development Initiative is a 14-day summer bridge program with academic-year follow-up support. The program builds academic confidence and mathematical skills for freshmen going into Algebra I by creating student allies who can help generate positive classroom cultures for teaching and learning.

Need. More than ever, the skills needed for college admission and a growing number of careers require achievement in higher levels of mathematics. Algebra I often serves as a gatekeeper, determining whether students will be able to access high levels of mathematics and numerous career tracks.

Goal. The goal of the Academic Youth Development Initiative is to improve student performance in high school mathematics courses, particularly among students who typically do not succeed in these courses.

Description of the Practice¹

The Academic Youth Development (AYD) Initiative² is an Algebra readiness program with the goal of supporting the successful transition of students from middle school to high school mathematics. AYD is not a remedial summer program; its focus is on helping students better understand content through multiple perspectives and with real-life applications. AYD also concentrates on teaching students persistence and giving them the power to be in charge of their own learning. For instance, students who view intelligence as a factor that can be improved with learning and habits of mind are more likely to persist through initial failure (Dweck, 2002). AYD gives students information about the changing nature of intelligence and encourages them not to see failure as a sign that they cannot learn, but to see it as a signal to change strategy.

The developers of AYD based the program on research findings about mathematics education, and on research showing that social psychological interventions can have remarkably strong effects on student engagement, test scores, and GPAs (Aronson, Fried, & Good, 2002; Good, Aronson, & Inzlicht, 2003). Attention to the social norms of students is key to improving the low performance of certain groups (Aronson, 2002; Bransford, Brown, & Cocking, 1999). Various studies find that as many as 60% of high school students are chronically disengaged, and that only 5% discuss school subject matter with their friends outside of school (Marks, 2000; Sedlak, Wheeler, Pullin, & Cusick, 1986; Steinberg, Brown, & Dornbusch, 1996). This

¹ This section was taken from the joint proposal entitled "Academic Youth Development Phase II Planning Grant Application: Creating a School Culture of Academic Engagement," submitted to The Carnegie Corporation of New York by Joshua Aronson, New York University, Dr. Stacey Rosenkrantz Aronson, & Uri Treisman, the Charles A. Dana Center at The University of Texas at Austin, June 2006.

² AYD was created through a partnership between the Minority Student Achievement Network, Agile Mind, Inc., and the Charles A. Dana Center. The Dana Center developed the *Practices Worthy of Attention* profiles.

disengagement occurs not because students fail to recognize the value of education, but rather because in the culture of the typical high school, valuing education has less motivational power for students than the more immediate and pressing social concerns arising in their day-to-day lives. Simply put, there seems to be some validity to the claim that adolescents in American school care about belonging—fitting in socially with their peers—more than they care about anything else (e.g., Arroyo & Zigler, 1995; Coleman, 1961).

Research suggests that minority students are particularly prone to put peers before their studies, and black and Hispanic males pay the highest social penalties for engaging academically (e.g., Fryer & Torelli, 2005; Graham, Taylor, & Hudley, 1998; Steinberg, Brown, & Dornbusch, 1996). Thus, there appears to be a trade-off for students between social or academic success that varies in intensity depending on race and gender. Schools can change their culture significantly by making small changes in the way they work. For example, pilot work is starting to confirm that it is possible to make an environment more conducive to academic engagement, for example, by enlisting socially influential teens into positions of academic leadership (Vaughn, 2006).

At the heart of AYD is a three-week transitional summer school and yearlong follow-up program. Rather than focus on the behavior of all students, the initiative focuses on the beliefs, attitudes, and behavior of a cadre of student allies upon whom the algebra teachers can rely to model respectful engagement and academic success and thus help shape the classroom culture during the regular school year.

The summer program has components for both mathematics and youth development. The mathematics component focuses on problem solving that connects prior learning to what the summer program students will experience in freshman algebra. The mathematics content is designed to help students gain expertise in a few key topics—ratio and proportionality—while learning to recognize what mastery of a topic feels like.

The youth development component provides the students with an explicit and rehearsed set of strategies for respectfully asking classmates to clarify their remarks, for entering a discussion, and for engaging in other acts critical to a successful classroom. This part of the curriculum helps students develop an appreciation for learning that will influence their attitudes about their own intelligence and help them create a culture of respect, engagement, accountability, and effective effort. Once students have created and experienced this culture in the summer, they explore the benefits of helping create a similar culture of respectful engagement in the coming school year.

There is a built-in transition between the summer school and the academic year. For instance, on the last day of the summer school, students write letters to their future Algebra I teachers, telling them what they learned over the summer and what their goals and hopes are for their freshman year. As part of the yearlong follow-up, during the school year, AYD students meet with their summer school teachers to remind each other what they learned over the summer and to reinforce how effective effort pays off.

Results

The Academic Youth Development (AYD) Initiative shows promise for improving teachers' understanding of student learning and improving students' confidence. Teachers involved in AYD in summer 2006 were part of the development team that constructed the materials for the program during the 2005–2006 academic year. Teachers worked with the content developers to determine what mathematical content and interpersonal and metacognitive skills students needed help with. Over the course of the year, AYD content developers and teachers co-developed the youth development components and structured the mathematics content. After all materials were finalized, teachers and content developers met to discuss the materials and talk about the scope and goals of the upcoming summer school, which developers called a pre-pilot.

For the pre-pilot in summer 2006, teachers nominated students who were at risk for failure in a future Algebra I course but who had good attendance and potential leadership skills. According to student self-reports, the majority of students who attended the program were racial/ethnic minorities (82%): 44% Hispanic, 27% black, 11% Asian American, 16% white, and 20% "other." (Students could select more than one ethnic category.)

During the pre-pilot, teachers completed a daily feedback form on the topics of mathematics pacing, mathematics content, mathematics student engagement, youth development pacing, youth development content, and youth development student engagement. Developers used these feedback forms to do a substantive revision of curricular materials and to inform the training that teachers would receive for the pilot in summer 2007.

In the first two days of the summer school, students completed an online survey about their attitudes and beliefs on theories of intelligence, sense of belonging in mathematics class, and awareness about and use of learning and study strategies. They also answered five mathematics content items involving the use of ratios and proportional reasoning. On the last day of the summer school, students completed the same survey.

Survey results show gains in student confidence in their mathematics ability and gains in understanding how to work hard to be successful. In the area of theories of intelligence, there were statistically significant differences ($p < 0.001$) in what students reported before and after the summer program. By the end of the summer program, students appeared to believe that they could be agents of change and in charge of their own learning.

Students' feelings, attitudes, and opinions about learning strategies also changed. Students' anxiety ("I worry that I will fail my math classes") decreased significantly ($p < 0.05$). Motivation ("When work is difficult, I either give up or only study the easy parts") went up significantly ($p < 0.03$). Students began to self-regulate their understanding more often ("I check to see if I understand what my teacher is saying during a class period"), at a statistically significant higher amount ($p < 0.02$). However, there were no statistically significant differences in information processing ("I try to find connections between what I am learning and what I already know").

Mathematics identification, enjoyment, and persistence (“Even when math problems are difficult, I enjoy working on them”) increased significantly ($p < 0.001$). Unfortunately, changes in achievement stigma (“It’s not ‘cool’ to do well in a math class”) did not change significantly, but there were still gains in students’ confidence about being “good” in math.

There were statistically significant gains for students’ sense of belonging, which indicates that the cultural shift of the classroom was successful, and students found their classrooms to be safe places in which to learn and question. Feelings of membership (“I feel that I belong to the math community”) increased significantly ($p < 0.05$), as did feelings of acceptance (“When I am in a math setting, I feel accepted”) ($p < 0.007$).

Conclusions

The Academic Youth Development Initiative aims to reshape the way teachers think about students, and the way students engage with their learning. Since the pre-pilot goal was to learn about implementation issues and improve the curriculum, the developers were pleasantly surprised to find out how much change there was in students’ attitudes about their ability to do mathematics. Future versions of AYD will include more teacher-targeted professional development, which can allow for evaluations of possible changes in teachers’ attitudes or pedagogical strategies. By partnering with schools, AYD hopes to track the student allies over time, looking at grades, what mathematics courses they take, and possibly standardized test scores, to see what long-term differences AYD may have.

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About *Practices Worthy of Attention: Local Innovations in Strengthening Secondary Mathematics*

Practices Worthy of Attention is a joint initiative of Achieve, Inc. (www.achieve.org), and the Charles A. Dana Center at The University of Texas at Austin (www.utdanacenter.org). The initiative is led by Pamela L. Paek, a research associate at the Dana Center, who, in 2006, examined 22 program, school, and district practices that showed promise—based on early evidence and observation—of strengthening secondary mathematics teaching and learning.

Our goal was to document practitioners' descriptions of *what is really happening* in the field to strengthen secondary mathematics education around the country. Thus, while the practice highlighted may be common, the specific structures and strategies used to implement the practice are worthy of attention. These initial investigations set out to mark these practices for future rigorous scientific inquiry by Dana Center and other researchers.

Ultimately, we hope to create a community of inquiry made up of university researchers working with administrators and teachers from featured schools and districts to more rigorously research how effectively these practices improve secondary mathematics learning for all students.

Reports and practice profiles. An executive summary details the methods for this initiative and analyzes themes. Two cross-case analyses discuss specific strategies for raising student achievement and building teacher capacity. Brief profiles describe each practice. All of these publications are available on our website at www.utdanacenter.org.

Data. In all cases, data about the practice were provided by the program, school, or district studied as part of a description of their practice. We did not independently analyze data gathered through a consistent assessment tool, and we did not evaluate their uses of data for measuring effectiveness. Thus, the data in the practice profiles are intended not to prove the practice's effectiveness from a research perspective, but to paint a detailed picture of the practice and what data were used by the program, school, or district to gauge how well it was working.

Theoretical frameworks. In some cases, district staff mentioned specific literature on theory or practice that they used when they developed the practice we highlight. In those cases, we cite that literature in our discussion of the practice.

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