

The Washington Student Oral History Project Research Brief
Math Attitudes and Experiences of Disconnected Youth

Background: In 2012-13 *The Washington Student Oral Histories Project (WSOHP)* gathered oral histories from over 50 Western Washington students who had previously dropped out of school. These in-depth interviews focused on the youth's educational experiences and attitudes towards school, starting from early primary to the present. Initial findings from these interviews are presented in a series of reports available on the projects' web site (www.wsohp.org), which capture youth perspectives on the dropping out process.

Current Research: In the project's current phase, we have re-analyzed the full interview data set of 53 youth narratives and will be releasing additional findings in 2014, focusing more narrowly on the role that *math and reading issues* played in the process of disengagement. While math difficulties were seldom the single reason youth became disengaged from school, math-oriented fear, hatred, and failure were prominent elements of the youth narratives we collected. Results of the analysis revealed these themes:

- **Math learning issues were widespread:** Among youth interviewed, 68 percent reported having serious math difficulties at some point prior to leaving school. By comparison, about half of the group reported serious learning issues related to reading and/or writing.
- **With regard to math learning issues, the gender gap between males and females was enormous:** Astonishingly, 90 percent of the girls reported serious problems in math. By comparison, only 55 percent of boys discussed serious math learning issues.
- **Early math mindsets present a somewhat contradictory picture:** The sentiments "I've never liked math" or "I've never been good in math" were pervasive among youth participants. However, in reflecting upon their learning challenges in elementary school, few actually recalled specific problems with math. At this stage, they were more likely to recall learning issues related to reading or spelling.
- **Elementary school learning contexts were overwhelmingly perceived as positive:** Most youth said they had little memory of what they actually learned or tried to learn across their elementary years in math and other subjects. However, they were able to reflect on their elementary school learning contexts *in general*. Most perceived their early learning environments quite favorably: they enjoyed school, liked their teachers, and liked learning. Youth who struggled in math or reading during elementary grades mostly felt supported by their teachers and the general learning environment. But by late middle school, many of these same youth no longer enjoyed learning or felt supported when they faced learning challenges.
- **Middle school math experiences solidified negative mindsets:** Youth who acknowledged having problems in math reported the full emergence of math-related learning issues in middle school. Youth frequently portrayed themselves as unprepared for the academic demands placed on them when they transitioned into middle, or in some case, early high school. Among academic subjects, math distressed youth the most—math issues came up more frequently than all other secondary school subjects combined. Even students who felt they had previously done well in and had enjoyed math now found themselves floundering, falling behind, and failing. These experiences influenced youth to solidify a fixed mindset and low self-efficacy regarding their math abilities:
- **Algebra was particularly problematic:** Youth repeatedly talked about being unprepared for and perplexed by algebra, often seeing it as something strange and unrelated to what they had previously been learning. Algebra appeared to be a major tripwire that led to course failure and undermined students' confidence in their math abilities.
- **Lack of positive connections with teachers contributed to math difficulties:** In middle school, youth experienced a general decline in positive connections to teachers and a concomitant decline in

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their sense of support for learning. The lack of personal connection to the teacher appeared to be particularly problematic for youth struggling in math. If they felt the math teacher did not support them in their struggles, they were less likely to ask the teacher for help when they didn't understand a concept. The failure to seek help, often combined with other non-productive behaviors such as not completing assignments, resulted in the youth falling further and further behind.

- **Instructional practices contributed further to a downward spiral in math:** Some of the practices that youth described as counter-productive included:
 - Relying too heavily on lecture-style instruction and then requiring students work independently: Many youth said they needed teachers to explain differently or provide more support when they didn't understand the direct instruction lesson.
 - Math course content seemed disconnected from students' lives. Youth didn't understand why they were being asked to learn something or why it might be important later.
 - One-size fits all sequence and pace of instruction: Once students fell behind they had difficulty catching up and eventually lost interest in trying.
 - Lack of differentiated instruction and individual supports for struggling students: This was one of the more prominent themes related to instructional practices: students didn't get the help they needed to understand math assignments, be able to do the work and progress.
 - Assigning homework, expecting struggling students to work independently on the homework. Those who could not complete class assignments became even more frustrated with homework they also didn't understand. Rather than helping youth learn the material, homework seemed to help solidify a fixed negative mindset.
- **Math struggles were directly connected with starting to skip school:** Math struggles and anxieties frequently cropped up in discussions of early skipping. The linkage between troubles with math and the inception of truant behavior was quite direct in a number of the narratives. Youth described how their struggles in math led to an avoidance strategy of skipping.

Implications:

Student accounts of their math struggles provided insight into the dynamics of their disengagement process. The major themes to emerge from their stories also suggest ways in which we might more successfully intervene to arrest and reverse this process.

At the Elementary Level:

- Use ongoing formative assessment to carefully track student understanding of foundational concepts and to inform instruction. Many students seemed to have entered middle school unprepared for the math they are expected to do.
- Ensure that every student is sufficiently versed in the basic concepts and skills they will need to progress and be successful in middle school.
- Be aware that ability comparisons start to emerge by late elementary school in ways that can promote a fixed mindset with regard to math, as well as other subjects. Purposefully use language to promote a growth mindset with regard to math learning in order to protect against the "I'm no good in math" syndrome.
- Explicitly prepare older elementary students for the transition to middle school—what they might expect and how to navigate the new environment in which individual help may not always be immediately available during class.

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At the Middle School Level

- Work with elementary feeder schools to identify entering students who are likely to need some extra instructional supports; develop support systems based on the needs of entering students and have them in place before the new students enter.
- Ensure that teachers understand the role that fixed mindsets and low self-efficacy play in undermining effort and performance and are aware of steps they can take promote a growth mindset.
- Explore creative opportunities for engaging low-performing students, especially girls, in math-related activities.
- Promote the use of ongoing classroom-based assessments to pinpoint student misconceptions and knowledge gaps related to foundational concepts (e.g., understanding and working with fractions, decimals and percentages). Use flexible, short-term grouping and regrouping strategies to address common misconceptions.
- Move away from heavy reliance on teacher-centered, direct instructional practices that demonstrate procedures. Best practice research suggests that multiple instructional approaches, including small group work and project-based learning are more effective.
- Encourage students to seek additional assistance when needed and convey a positive interest in their success. Recognize that students in the grip of an “I’m no good in math” mindset may be especially reluctant to engage in math learning tasks at first; poor academic behaviors such as not listening in class or not doing homework may be a protective strategy.
- Track and analyze student course-taking data to learn in which courses the D’s and F’s tend to cluster. Of particular interest are the failure rates in Algebra I and II classes.
- Create greater relevance in the math curriculum to engage more students. Contextualize math instruction by relating concepts and skills being taught to real world problems.
- Positive social connections to teachers contribute to student engagement and learning. Promote teacher practices that contribute to a welcoming, positive atmosphere in the class.

At the High School Level:

- Restructure math curricula to allow students greater flexibility in mastering core concepts and skills at their own pace. Requiring all students within a class to be working on the same material at the same time will automatically penalize students who lag behind.
- Consider alternative grading schema that reward students who have fallen behind when they progress and demonstrate mastery over new material.
- Examine whether homework policies, particularly with regard to grading, may be inadvertently discouraging struggling students.
- Develop homework supports for students, such as call-in centers, study halls or after school tutoring staffed with teachers, tutors or volunteers that have math expertise matched to the students’ needs.
- Investigate ways for career exploration activities to be more tightly integrated with math instructional goals.

The full report on these findings will be available at our website www.wsohp.org in March 2014. For further information, please feel free to contact us through the website or directly:

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