Integrating Social and Emotional Learning and the Common Core State Standards for Mathematics | Making the case

Overview:

The CCSS for Mathematics raise the bar for students and educators

After their 2010 release, the Common Core State Standards were widely adopted, raising the bar for both students and schools. These standards represent a turning point in American education, as for the first time in history, a critical mass of education leaders are calling for greater equity and access for all students by committing to implement common standards. These standards provide greater rigor, coherence, and focus than ever before; they constitute a true roadmap for preparing all students for college, career, and citizenship.

The Common Core State Standards specify the most important content students must understand in Mathematics and in English Language Arts and Literacy; the standards also describe important ways in which students should engage with the content.

Taken together, the rollout of the CCSS and this shift in the expectations for educator performance reflect an understanding in the field that schools must think holistically about students' learning experience.

In the *Common Core State Standards for Mathematics*, the Standards for Mathematical Practice (also known as SMPs) in particular reflect the view that learning is a social process, implicitly calling for teaching practices that leverage the power of group work and collaborative learning. The Standards for Mathematical Practice require that students solve real-world and mathematical problems by working effectively with peers; formulating, communicating and critiquing arguments; and persevering through difficulty. In short, the SMP support students' full engagement in mathematical learning.

The CCSS initiative emerged during a national push for high-stakes testing and accountability with expectations for clear measures of teacher effectiveness. At the same time there was a widespread shift in teacher evaluation plans across the country to emphasize instructional planning, preparation, and the promotion of a collaborative and collegial environment.

Taken together, the rollout of the CCSS and this shift in the expectations for educator performance reflect an understanding in the field that schools must think holistically about students' learning experience. Teachers can practice a more comprehensive approach through a number of creative strategies that leverage students' diverse strengths.

In particular, to support effective collaborative learning, teachers can model for their students positive behaviors that promote crucial social and emotional skills. Schools and districts can support this work by adopting policies that acknowledge the importance of positive learning environments. They can also provide teachers with tools to identify and promote the skills that students need for continued learning and for applying their growing knowledge flexibly to solve real-world problems.

I. The Common Core State Standards for Mathematical Practice and the social and emotional learning competencies are inextricably linked

An emphasis on the social and emotional aspects of learning is a common thread in the American education system's move toward common standards to support student learning. The phrase *social and emotional learning*, or SEL, is widely used to refer to the process of developing skills and attitudes that students need for success in school, work, and life.

Social & Emotional Learning Core Competencies

The Collaborative for Academic, Social, and Emotional Learning (CASEL) describes SEL in terms of five domains of competence: *self-awareness*, *self-management*, *social awareness*, *relationship skills*, and *responsible decision-making*.

These competencies are sometimes discussed under other names, such as noncognitive skills (Dweck, Walton, & Cohen, 2014; Duckworth & Yeager, 2015), life skills (Botvin & Griffin, 2004), or 21st-century skills (National Research Council, 2012; Silva, 2009), but central among them is an emphasis on both interpersonal skills and intrapersonal skills.

Five SEL Core Competencies as Identified by CASEL[1]

- **Self-awareness:** The ability to accurately recognize one's emotions and thoughts and their influence on behavior. This includes accurately assessing one's strengths and limitations and possessing a well-grounded sense of confidence and optimism.

- **Self-management:** The ability to regulate one's emotions, thoughts, and behaviors effectively in different situations. This includes managing stress, controlling impulses, motivating oneself, and setting and working toward achieving personal and academic goals.

- **Social awareness:** The ability to take the perspective of and empathize with others from diverse backgrounds and cultures, to understand social and ethical norms for behavior, and to recognize family, school, and community resources and supports.

- **Relationship skills:** The ability to establish and maintain healthy and rewarding relationships with diverse individuals and groups. This includes communicating clearly, listening actively, cooperating, resisting inappropriate social pressure, negotiating conflict constructively, and seeking and offering help when needed.

- **Responsible decision-making:** The ability to make constructive and respectful choices about personal behavior and social interactions based on consideration of ethical standards, safety concerns, social norms, the realistic evaluation of consequences of various actions, and the well-being of self and others.

The importance of the five competencies identified by CASEL is reflected in the language used in the CCSS for Mathematics and in these standards' call for students to be able to apply knowledge to solve real-world problems. In fact, examining the Common Core State Standards for Mathematical Practice text makes it hard to imagine how students could fully achieve the competencies described in these standards without demonstrating strength in CASEL's SEL

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[1] Quoted from CASEL: Collaborative for Academic, Social, and Emotional Learning. Social and Emotional Learning Core Competencies. http://www.casel.org/social-and-emotional-learning/core-competencies

competencies (see Appendix B for a table laying out some of the connections between the Standards for Mathematical Practice and the SEL competencies).

As an example, SMP 1 requires that students "Make sense of problems and persevere in solving them." Mathematically proficient students "...understand the approaches of others to solving complex problems and identify correspondences between different approaches." To effectively engage in this practice, students must be able to stay calm when facing a challenging problem (*self-management*), recognize when they lack the knowledge to solve a problem (*self-awareness*), effectively solicit help from others (*relationship skills*), and learn from others how they solve problems (*social awareness*).

II. Benefits of integrating social and emotional learning into education practice

Beyond the clear connections to the Standards for Mathematical Practice, social and emotional learning is also a key ingredient for cultivating a rich and supportive learning environment (Ryan & Deci, 2000; Patrick, Ryan, & Kaplan, 2007; Ryan, Gheen, & Midgley, 1998), which is crucial to successful implementation of the CCSS and of modern measures of teacher effectiveness (such as those in Charlotte Danielson's *The Framework for Teaching*). Integrating explicit attention to SEL at the classroom, school, and district levels promotes an academic climate conducive to learning. And often, integrating SEL strategies only requires modifying or expanding high-quality interactions that are already happening.

For example, many teachers already routinely implement practices, such as perspective-taking and help-seeking, that promote their students' social and emotional learning. In such situations, a modest amount of additional attention to highlighting teaching practices that promote SEL can maximize a school or district's ability to support the learning of both its students and its staff. Highlighting effective strategies already in use encourages broader use of these and similar strategies.

The intrinsic connection between SEL and education trends that focus on creating positive learning environments and facilitating deeper learning is supported by research evidence (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; National Research Council, 2012). Cultivating students' social and emotional development offers immediate and long-term benefits (Durlak et al., 2011).

In fact, Durlak et al.'s 2011 meta-analysis of 213 rigorous studies of SEL in schools indicated that on average, students receiving quality SEL instruction demonstrated academic achievement 11 percentile points higher than that of their counterparts who did not receive SEL instruction.

The bottom line . . .

For every $1 spent implementing SEL programs, $11 is saved in resources that are not expended managing behavior problems and additional interventions for "at-risk" youth...

—Belfield et al., 2015

In regard to specific gains in mathematics, a recent statewide study in West Virginia using project-based learning, an instructional approach that deeply integrates SEL, found that classrooms with math teachers who implemented project-based learning had students who could create their own original products, generate their own problem solving ideas, create a product in collaboration, and use a variety of media to convey ideas (Ravitz, 2013).

Additionally, a study comparing the performance of students being taught using the Dana Center–Agile Mind online course program *Intensified Algebra*, which includes explicit SEL supports, to a comparable group of ninth-grade students taking a typical algebra course showed that when implemented with fidelity, the Intensified Algebra program significantly increased student achievement (Tidd, Stoelinga, Bush-Richards, De Sena, & Dwyer, 2015).

Research also shows that developing SEL skills cultivates students who demonstrate significantly greater motivation to learn, deeper commitment to school, increased time devoted to schoolwork, better classroom behavior, fewer negative behaviors (e.g., disruptiveness, noncompliance, and aggression), fewer disciplinary referrals, and reduced emotional distress (e.g., fewer reports of student depression, anxiety, stress, and social withdrawal). The value of SEL also extends beyond the classroom, with studies showing SE competencies predicting success in work settings (National Research Council, 2012).

In fact, emotional intelligence research points to social and emotional skills as providing a strong foundation of practical abilities that facilitates success throughout life (Goleman, 2013; Goleman, 2003), which is also a goal of the CCSS for Mathematics. Moreover, recent research has highlighted the fiscal benefits of promoting students' social and emotional skills. A 2015 study conducted by the Center for Benefit-Cost Studies in Education at Columbia University's Teachers College indicated that six of the most commonly used SEL programs showed an impressive average benefit to cost ratio of 11 to 1 (Belfield et al., 2015). In other words, for every $1 that was spent implementing these programs (beyond what would normally be spent on instruction), $11 was saved in resources that were not expended dealing with behavior problems and additional interventions for "at-risk" youth (Espelage, Low, Polanin, & Brown, 2013).

III. A focus on SEL is gaining momentum in education policy

As research makes the benefits of integrating SEL into academics increasingly clear, while also showing that these skills are teachable throughout life, education policies across the nation are reflecting an emphasis on the continual growth of students' SEL as an ingredient key to their academic success.

Although for many years, SEL has been valued in early childhood education across the country (Bierman, Nix, Domitrovich, Welsh, & Gest, 2015; Dusenbury, Weissberg, Goren, & Domitrovich, 2014; Rimm-Kaufman & Hulleman, 2015), in 2004, Illinois became the first state to adopt comprehensive K–12 SEL standards. More recently, Kansas and Pennsylvania joined Illinois by adopting their own set of free-standing K–12 SEL standards. As of 2015, CASEL's ongoing scan of state policies and standards related to SEL indicates that at least eight additional states have SEL policies developing in their legislature.

Educators and lawmakers in these pioneering states know that social and emotional development does not stop in preschool, but must be cultivated in students through the high school years (Dusenbury, Weissberg, Goren, & Domitrovich, 2014; Dusenbury et al., 2015). Though work to embed SEL into education policy continues at both the state and the federal level, some school districts are forging forward on their own. This trend is an encouraging sign that momentum is building behind SEL and that an increasing number of educators and education leaders understand how important SEL is to success in rigorous academics, including the academic practices and content described in the CCSS for Mathematics.

IV. Collaborating Districts Initiative members put in place systemic SEL supports

CASEL believes that SEL is best leveraged to support students when it is integrated at multiple levels, including the classroom, school, and district (Mart, Weissberg, & Kendziora, 2015).

Innovative educators across the nation are making integration of SEL into their schools a priority and are forging a roadmap of success for their colleagues to follow. Eight of the nation's largest school districts, all part of CASEL's Collaborating Districts Initiative, are integrating SEL into their instructional practices, learning environment, learning standards (e.g., the CCSS), and nearly every aspect of daily operations.

These districts demonstrate that aligning SEL with academics, while also integrating SEL systemically, can lead to positive and powerful impacts on student outcomes.

Collaborating Districts Initiative

Anchorage, Alaska
Austin, Texas
Chicago, Illinois
Cleveland, Ohio
Nashville, Tennessee
Oakland, California
Sacramento, California
Washoe County, Nevada

In **Chicago Public Schools**, crosswalks that highlight the intersections between SEL and the CCSS for Mathematics support teachers in drafting unit and lesson plans as part of the Common Core professional development process. These crosswalk tools facilitate collaboration across central office departments, which occur during the district's Integration Summits. These summits provide opportunities for departments to share how their work supports success with the Common Core.

In the **Washoe County School District**, the Core Task Project[2] embeds SEL throughout the district by assembling central office SEL leads and school grade-level teams to emphasize the intersections between SEL skill development and current definitions of high-quality instruction. This project uses planning time to draft lessons that include SEL and to identify opportunities to integrate SEL into existing practices. Washoe district leaders believe that their focus on high-quality instruction creates a sense of shared mission and ensures neither SEL nor CCSS will feel like disjointed initiatives.

Several other Collaborating Districts Initiative members have integrated SEL into curriculum, lessons, and student benchmarks. For example, the **Cleveland Metropolitan School District** has aligned SEL standards with the CCSS by developing a scope and sequence that addresses SEL competencies, with model lesson plans aligned with the CCSS.

The **Anchorage School District**[3] has created an infusion and integration action group that works to integrate SEL into lessons at the elementary and secondary level. An example of this group's work is the rewriting of the second-grade curriculum in social studies to integrate SEL within the subject lessons.

Similarly, the **Austin Independent School District** has created a Curriculum Writer's Cadre,[4] an annual workshop that brings together over 200 teachers and SEL department staff to collaboratively write new curriculum that integrates SEL across various academic content areas.

Sacramento City Unified School District's[5] SEL Standards and Assessment workgroup has embedded SEL standards into the district's Graduate Profile, which identifies the key competencies and benchmarks that address academic, technical, and SEL knowledge and skills, while also serving as a barometer of student preparedness for life after graduation.

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[2] http://coretaskproject.com/tag/washoe
[3] http://www.asdk12.org/pld/sel/aboutsocialemotionallearning/team
[4] http://www.austinisd.org/academics/curriculum/cwc, https://www.austinisd.org/academics/sel
[5] http://www.scusd.edu/social-emotional-learning-sel-1, https://sites.google.com/site/scusdselwiki

Within the **Oakland Unified School District**,[6] the CCSS are viewed as an opportunity to renew focus on educating the whole child. Oakland's approach is to highlight and leverage the connections that already exist between the CCSS and the SEL competencies. In fact, during the summer of 2013, Oakland used SEL as the organizing framework for their Common Core Institute.

The **Metropolitan Nashville Public Schools**[7] district has used various approaches to integrate SEL into its curriculum, including district-wide adoption of three evidence-based programs (Responsive Classroom, the Olweus Bullying Prevention Program, and project-based learning) and the alignment of various SEL-relevant initiatives within the district; and inclusion of SEL strategies into their classroom management approach.

The Collaborating Districts Initiative: Anchorage School District, Austin Independent School District, Chicago Public Schools, Cleveland Metropolitan School District, Metropolitan Nashville Public Schools, Oakland Unified School District, Sacramento City Unified School District, and Washoe County School District

These district examples reflect only a small snapshot of the powerful work being done in schools and districts across the country. A 2015 report by the American Institutes for Research (AIR), external evaluator for the Collaborating Districts Initiative, noted that the member districts' focus on deeply integrating SEL is beginning to pay dividends.

AIR's report indicated that CDI districts have seen improvements in academic achievement and student behavioral outcomes since the CDI began. Further, AIR's analysis showed that schools that made greater progress with SEL-focused implementation plans experienced greater gains in student outcomes than did schools that made less progress with implementation, suggesting that integrating SEL into their school and district practices was a key mechanism behind the districts' improvements (American Institutes for Research, 2015).

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[6] http://publicportal.ousd.k12.ca.us/Domain/143
[7] http://www.mnps.org/pages/mnps/Academics/Social_and_Emotional_Learning/Social___Emotional_Learning

V. Educators can access a variety of SEL and SEL-integrated resources

In addition to the scaffolding offered by SEL-integrated district policies, professional development, and lesson integration, educators implementing SEL can also find support in SEL and SEL-integrated programs or curricula. These programs or curricula provide various kinds of support, including the following:

- Explicitly teaching SEL skills to students (e.g., Lion's Quest, PATHS, and Academic Youth Development)[8]
- Training teachers in ways of promoting social and emotional skills in their students (e.g., My Teaching Partner, Developmental Designs, and Expeditionary Learning)[9]
- Systematically integrating SEL into the instruction of academic content (e.g., Intensified Algebra and Facing History and Ourselves).[10]

Two mathematics programs that integrate social and emotional learning

> Given this paper's focus on social and emotional learning and mathematics, here we take a deeper look at two programs that integrate mathematics content and social and emotional learning competencies.

Intensified Algebra I

The Charles A. Dana Center at the University of Texas at Austin, in collaboration with the Learning Sciences Research Institute at the University of Illinois at Chicago and Agile Mind,[11] developed a program that integrates SEL with rigorous Algebra instruction.

Intensified Algebra I is a comprehensive program for double-block Algebra I class designed to help students one or more years behind grade level succeed in algebra within one academic year. Intensified Algebra combines core algebra content and application of mathematical reasoning with explicit SEL supports focused on key attitudes and behaviors essential to student success.

In a study comparing student achievement in classes with low-fidelity or high fidelity implementations of double-block Intensified Algebra with the performance of a comparable group of students taking a typical algebra course in ninth grade, the results show that when implemented with fidelity, participation in the Intensified Algebra program significantly increased the achievement of participating students.

The passing rates for the end-of-course assessment for the high-fidelity group were more than two-and-a-half times those of the comparison group (Tidd, Stoelinga, Bush-Richards, De Sena, & Dwyer, 2015).

Academic Youth Development

The Dana Center has also collaborated with Agile Mind to create the Academic Youth Development family of research-based programs to prepare students for academic success with problem solving approaches that are embedded in a youth development curriculum.

AYD helps students to reshape their academic identities and enhance their engagement in learning.

To date, AYD has been implemented in over 500 schools across several states. Across multiple years of data, students reported changes on both mindsets and academic behaviors, such as malleability of intelligence, self-efficacy, and persistence on academic achievement.

For example, evaluators at Boston Public Schools gathered data to measure AYD and non-AYD student achievement in Algebra I after the AYD summer experience. During the first marking period of the school year, twice as many AYD students as non-AYD students earned an A in Algebra, and the failing rate among AYD students was one fifth that of non-AYD students (Charles A. Dana Center & Agile Mind, 2014).

In one district in Texas, AYD students earned higher average grades during the following academic year in Algebra than did their non-AYD peers and performed better on standardized mathematics assessments.

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[8] http://www.lions-quest.org; http://www.pathstraining.com/main; http://www.agilemind.com/programs/academic-youth-development
[9] http://curry.virginia.edu/research/centers/castl/mtp; https://www.originsonline.org/developmental-designs; http://elschools.org
[10] http://www.agilemind.com/programs/mathematics/intensified-algebra-i; https://www.facinghistory.org
[11] http://www.utdanacenter.org; http://www.lsri.uic.edu; http://www.agilemind.com

In addition to programming and curricula, various types of tools are becoming available to support teachers, schools, and districts in their efforts to promote students' SEL skills and thus, their academic and overall success. The project from which this white paper emerged, "Connecting Mathematics Content and Social and Emotional Learning to Instruction," is aimed at providing such tools and support for integrating SEL to ultimately achieve the goals of the Common Core State Standards for Mathematics, and particularly the Standards for Mathematical Practice.

At the school and classroom level, this project produced an illustrative picture of an **ideal classroom** in which SEL supports algebra instruction.

To directly support teachers in classrooms, this project developed and piloted a set of **instructional guides**, each built around an engaging formative assessment task from the Mathematics Assessment Resource Service (MARS).[12] These instructional guides demonstrate how teachers can help students achieve the competencies described in the Common Core State Standards for Mathematical Practice by promoting students' social and emotional skills.

These tools highlight opportunities to evaluate students' social and emotional skills, while also recommending strategies to promote them.

VI. Social and emotional learning for all

As initiatives such as the CCSS, accountability systems, and teacher evaluation frameworks dominate today's education landscape, a focus on the underlying skills and practices that support academic achievement can serve as a constant that anchors district reform efforts. The five social and emotional learning competencies as identified by CASEL provide a coherent framework for delivering instruction that incorporates these supportive skills and practices.

There are clear connections between SEL competencies and the skills called for by the Common Core State Standards for Mathematical Practice (see Appendix B). The deep and generalizable learning required by the SMP requires that students use social and emotional learning skills to manage their emotions, set goals and develop plans, persevere through adversity, collaborate with peers, and construct and communicate arguments effectively.

CASEL's CDI districts have shown that supportive leadership, high-level collaboration, and professional learning opportunities are factors that create a focus on integrating SEL into core content instruction and promote an environment that supports social and emotional learning systemically. Collaborating Districts Initiative members report that SEL has played a particularly vital role in professional learning. The inclusion of SEL in Common Core professional learning activities simultaneously builds and distributes SEL capacity throughout districts while advancing the overall quality of teaching and learning.

Additionally, cross-district learning communities can leverage the experience of districts to model effective SEL practices on a macro level. School and district administrators across the country can propel their own and other districts toward success by forming and participating in such communities to build capacity nationwide.

Educators can also look to SEL and SEL-integrated programming for help promoting their students' social and emotional skills. Evaluations of effectiveness for some of these programs are ongoing, but some resources exist to identify high quality programs and should be referenced when selecting a program to implement. CASEL has published two guides for schools to use in identifying

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[12] http://www.insidemathematics.org/performance-assessment-tasks or http://mathshell.org/ba_mars.htm

high quality and effective programs with a strong evidence base: one for programs at the preschool and elementary school level, and another for programs that serve middle and high school.[13]

By weaving SEL into content instruction and bridging organizational silos to shine a light on the alignment between SEL and academics, districts across the nation are viewing social and emotional learning less as an add-on or special program for a subset of students, and more as an essential component of the academic program. In adopting SEL as a key component of their instructional program, education leaders rise to the challenge presented by the Common Core State Standards—and other demanding academic standards—and provide their students opportunities to build the personal and social skills needed for success in school and in life.

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[13] 2013 CASEL Guide: Effective Social and Emotional Learning Programs—Preschool and Elementary School Edition and 2015 CASEL Guide: Effective Social and Emotional Learning Programs—Middle and High School Edition, both available via http://www.casel.org/guide

a project of   The University of Texas at Austin
Charles A. Dana Center   &   CASEL

Works cited

For links and descriptions of related Dana Center, CASEL, and *Common Core State Standards for Mathematics* resources, please see Appendix A, "Annotated list of resources."

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Appendix A: Annotated list of resources from the Dana Center and CASEL

The Charles A. Dana Center at the University of Texas at Austin[14]

The Dana Center and education publisher Agile Mind have developed comprehensive course programs embedded with social and emotional learning supports:

Academic Youth Development[15] is a research-based family of programs for educators and their students designed to strengthen students' academic identities, enhance their engagement in learning, and transform their achievement. Targeting the specific needs of different audiences, the programs in the AYD family share common foundations in the latest research on student motivation, engagement, and learning.

> Summer-Start AYD[16] serves students entering Algebra I who are at or near grade level in mathematics and begins with an intensive summer experience.

> School-Year AYD[17] serves students in 8th, 9th, or 10th grade during the academic year.

> An Educator's Course in AYD[18] is designed for cohorts of educators interested in learning about the emerging research on student learning and motivation and exploring strategies to put this research into practice in their schools and districts.

> *Academic Youth Development: Promising Findings and District Snapshots*[19]

Intensified Algebra I,[20] a comprehensive program used in an extended-time algebra class, helps students who are one to two years behind in mathematics become successful in algebra. Central to the program is the idea that struggling students need a powerful combination of a challenging curriculum; cohesive, targeted supports; and additional well-structured classroom time. Intensified Algebra I seeks to address the need for a robust Algebra I curriculum with embedded, efficient review and repair of foundational mathematical skills and concepts. It aims to address multiple dimensions of learning mathematics, including social, affective, linguistic, and cognitive.

> Key design features of Intensified Algebra I[21]

> A description of how Intensified Algebra I integrates those topics that are most critical for success in a first algebra course and in future mathematics courses.

> What teachers think about Intensified Algebra I[22]
> A brief of an evaluation conducted by Inverness Research that documented the experiences and opinions of teachers who piloted Intensified Algebra I materials in their classroom.

> Intensified Algebra I: Program and research update[23]

> An overview of the Intensified Algebra program and its impact on student success. Includes summaries of case studies of success in schools and districts.

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[14] http://www.utdanacenter.org

[15] http://www.agilemind.com/programs/academic-youth-development

[16] http://www.utdanacenter.org/pre-kindergarten-12-education/tools-for-teaching-and-learning/comprehensive-course-programs/academic-youth-development/summer-start-ayd

[17] http://www.utdanacenter.org/pre-kindergarten-12-education/tools-for-teaching-and-learning/comprehensive-course-programs/academic-youth-development/school-year-ayd

[18] http://www.utdanacenter.org/pre-kindergarten-12-education/tools-for-teaching-and-learning/comprehensive-course-programs/academic-youth-development/an-educators-course-in-ayd

[19] http://www.utdanacenter.org/wp-content/uploads/RB_AYD_0514_WEB.pdf

[20] http://www.utdanacenter.org/pre-kindergarten-12-education/tools-for-teaching-and-learning/intensified-algebra

[21] http://www.utdanacenter.org/pre-kindergarten-12-education/tools-for-teaching-and-learning/intensified-algebra/key-design-features-of-intensified-algebra

[22] http://www.utdanacenter.org/wp-content/uploads/IA_inverness_evaluation_brief_june2012.pdf

[23] http://www.utdanacenter.org/wp-content/uploads/IA_I_program_and_research_update_01102013.pdf

Additional resources

Learning and the Adolescent Mind[24]

> This site shares with parents and educators the most compelling knowledge about student learning and success, through the ideas and the research of the most respected leaders and emerging thinkers in the fields of psychology and adolescent education.

Dana Center resources available through its online catalog[25]

Common Core State Standards for Mathematics chart: Grades K–8

> A full-color, poster-size wall chart that displays the Common Core State Standards for Mathematics for Kindergarten through grade 8, organized by grade level and domain.

Common Core State Standards for Mathematics chart: Grades 6–High School

> A full-color, poster-size wall chart that displays the Common Core State Standards for Mathematics for grades 6 through high school. The chart displays the middle school standards organized by grade level and by domain. The high school standards are organized by conceptual categories and aligned with the middle school domains to accentuate the natural connections to the middle school content.

Algebra Formative Assessments Through the Common Core series

> A standards-aligned assessment series for mathematics teachers and leaders consisting of 121 tasks aligned to the *Common Core State Standards for Mathematics* grouped into four thematically related books.

Collaborative for Academic, Social, and Emotional Learning (CASEL)[26]

What Is Social and Emotional Learning?[27]

> An overview of SEL and its five core competencies

CASEL Guide: Effective Social and Emotional Learning Programs

Preschool and Elementary School Edition (2013)[28]

Middle and High School Edition (2015)[29]

> The CASEL Guide provides a systematic framework for evaluating the quality of social and emotional programs and applies this framework to identify and rate well-designed, evidence-based SEL programs with potential for broad dissemination to schools across the United States. The Guide also shares best-practice guidelines for district and school teams on how to select and implement SEL programs. Finally, it offers recommendations for future priorities to advance SEL research and practice.

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[24] http://learningandtheadolescentmind.org/index_flash.html
[25] http://www.utdanacenter.org/catalog
[26] http://www.casel.org
[27] http://www.casel.org/social-and-emotional-learning
[28] http://www.casel.org/s/2013-casel-guide.pdf
[29] http://www.casel.org/middle-and-high-school-edition-casel-guide

Benefits of SEL

Social and Emotional Learning in Schools: From Programs to Strategies[30]

> This report provides an overview of social and emotional learning (SEL) in schools. It argues for going beyond programmatic approaches to a strategy that integrates SEL into all aspects of educational practice, including academic instruction and school climate.

The Impact of Enhancing Students' Social and Emotional Learning: A Meta-Analysis of School-Based Universal Interventions[31]

> This review of 213 studies of school-based social and emotional learning programs was published in the January 2011 issue of Child Development and has become one of the most important and frequently cited documents in the SEL field.

The Missing Piece: A National Teacher Survey on How Social and Emotional Learning Can Empower Children and Transform Schools[32]

> The central message of this report is that teachers across America understand that social and emotional learning (SEL) is critical to student success in school, work, and life.

Integrating SEL and Academic Learning

Academic Learning + Social and Emotional Learning = National Priority[33]

> An article by CASEL's Roger Weissberg and Jason Cascarino that explains why educators, researchers, and policy makers need to make social and emotional learning a priority in education at every level: classroom, school, district, state, and nation.

Teaching The Whole Child: Instructional Practices That Support Social–Emotional Learning In Three Teacher Evaluation Frameworks[34]

> This report provides an overview of social and emotional learning (SEL) and how it is relevant to a variety of student academic outcomes. It provides a detailed description of teaching practices that promote student competencies and links these practices to current professional teaching frameworks.

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[30] http://www.srcd.org/sites/default/files/documents/spr_264_final_2.pdf

[31] Durlak J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011 January-February). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development, 82*(1), 405-432. Retrieved August 29, 2015, from http://dx.doi.org/ 10.1111/j.1467-8624.2010.01564.x

[32] Civic Enterprises, Bridgeland, J., Bruce, M., & Hariharan, A. (2013). *The missing piece: A national teacher survey on how social and emotional learning can empower children and transform schools*. Chicago, IL: Collaborative for Academic, Social, and Emotional Learning. Retrieved August 29, 2015, from http://www.casel.org/library/the-missing-piece

[33] Weissberg, R. P., & Cascarino, J. (2013 October). Academic learning + social-emotional learning = national priority. *Phi Delta Kappan, 95*(2): 8–13. Retrieved August 31, 2015, from http://www.casel.org/s/weissberg-cascarino-phi-delta-kappan.pdf or http://dx.doi.org/10.1177/003172171309500203

[34] Yoder, N. (2014 January). *Teaching the Whole Child: Instructional Practices That Support Social-Emotional Learning in Three Teacher Evaluation Frameworks*. Research-to-Practice Brief, Revised Edition. Washington, DC: Center on Great Teachers and Leaders at American Institutes for Research. Retrieved August 31, 2015, from http://www.gtlcenter.org/sites/default/files/TeachingtheWholeChild.pdf

Aligning Preschool through High School Social and Emotional Learning Standards: A Critical and Doable Next Step[35]

This brief calls for an alignment of birth to preschool and K–12 state standards for social and emotional learning. It presents overviews of SEL competencies and state standards and includes examples of aligned SEL standards in two states (Illinois and Pennsylvania) that have been leaders for the field. The brief concludes with recommendations for aligning SEL and academic standards and guidelines for the development of state standards for SEL generally.

Books

Building Academic Success on Social and Emotional Learning: What Does the Research Say?[36]

In this book, nationally recognized leaders in education and psychology examine the relationships between social-emotional education and school success—specifically focusing on interventions that enhance student learning. Offering scientific evidence and practical examples, this volume points out the many benefits of social-emotional learning programs.

Promoting Social and Emotional Learning: Guidelines for Educators[37]

This book addresses a crucial need among educators for a straightforward, practical guide to establishing high-quality social and emotional education programs. True academic success and lasting social effectiveness, the authors believe, require strong social and emotional skills.

Common Core State Standards

The official website of the Common Core State Standards[38]

Common Core State Standards for Mathematics[39]

A description of the Common Core State Standards for Mathematics along with links to PDF and HTML versions of the standards.

Standards for Mathematical Practice[40]

Webpage containing the Standards for Mathematical Practice, a subset of the *Common Core State Standards for Mathematics* that describe the processes and proficiencies that students should develop and engage in to be successful learners in mathematics.

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[35] Zinsser, K. M., Weissberg, R. P., & Dusenbury, L. (2013). Aligning preschool through high school social and emotional learning standards: A critical and doable next step. Chicago, IL: Collaborative for Academic, Social, and Emotional Learning. Retrieved August 31, 2015, from http://www.casel.org/library/2013/12/5/aligning-preschool-through-high-school-social-and-emoonal-learning-standards

[36] J. E. Zins, R. P. Weissberg, M. C. Wang, & H. J. Walberg, Eds. (2004). *Building Academic Success on Social and Emotional Learning: What Does the Research Say?* The series on social emotional learning, 5. NY, NY: Teachers College, Columbia University.

[37] Elias, M. J., Zins, J. E., Weissberg, R. P., Frey, K. S., Greenberg, M. T., Haynes, N. M., Kessler, R., Schwab-Stone, M. E., & Shriver, T. P. (1997). *Promoting Social and Emotional Learning: Guidelines for Educators.* Alexandria, Virginia: Association for Supervision and Curriculum Development.

[38] http://www.corestandards.org

[39] http://www.corestandards.org/Math

[40] http://www.corestandards.org/Math/Practice

Appendix B: Connecting the Standards for Mathematical Practice and Social and Emotional Learning Competencies

The purpose of this appendix is to illustrate the connections between the Common Core State Standards for Mathematical Practice (CCSS-SMP) and social and emotional learning (SEL) competencies.

Table 1. Connections between the CCSS-SMP and SEL competencies

	Common Core State Standards for Mathematical Practice	Social and Emotional Learning Competencies
SMP 1 — Make sense of problems and persevere in solving them.	Mathematically proficient students ***start by explaining to themselves the meaning of a problem and looking for entry points to its solution***. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than *simply jumping into a solution attempt*. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They ***monitor and evaluate their progress and change course if necessary***. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can ***understand the approaches of others*** to solving complex problems and identify correspondences between different approaches.	***Be aware of their strengths and what they know*** Self-awareness ***Resist impulses and regulate their thoughts and behaviors*** Self-management ***Manage their time and energy toward a goal while appraising their work*** Self-management ***Take on others' perspectives*** Social awareness
SMP 2 — Reason abstractly and quantitatively.	Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to ***pause as needed during the manipulation process in order to probe into the referents for the symbols involved***. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.	***Self-regulate and think metacognitively*** Self-management

Common Core State Standards for Mathematical Practice	**Social and Emotional Learning Competencies**
SMP 3 — Construct viable arguments and critique the reasoning of others. Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They *justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose*. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can *listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments*.	*To anticipate how students' own arguments may be interpreted and received, take on the perspectives of others* Social awareness *Think meta-cognitively and organize their own thoughts with given information* Self-management *Understand others' perspectives to effectively interpret their arguments* Social awareness *Listen actively to further explore the arguments of others* Relationship skills

Common Core State Standards for Mathematical Practice		Social and Emotional Learning Competencies
SMP 4 — Model with mathematics.	Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are ***comfortable making assumptions and approximations*** to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They ***routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose***.	***Be aware of their own strengths and limitations*** Self-awareness ***Self-reflect and self-motivate by recognizing the need to improve and work toward goals*** Self-management
SMP 5 — Use appropriate tools strategically.	Mathematically proficient students ***consider the available tools*** when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to ***use technological tools to explore and deepen their understanding of concepts.***	***Think meta-cognitively to identify when to use what tool; motivate themselves to deepen their current understanding*** Self-management ***Motivate themselves to deepen their current understanding*** Self-management

	Common Core State Standards for Mathematical Practice	Social and Emotional Learning Competencies
SMP 6 — Attend to precision.	Mathematically proficient students try to ***communicate precisely to others***. They try to ***use clear definitions in discussion with others*** and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign *consistently* and *appropriately*. They are *careful* about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students ***give carefully formulated explanations to each other***. By the time they reach high school they have learned to examine claims and make explicit use of definitions.	***Take on the perspective of others and be aware of others' thoughts and feelings in order to strengthen the effectiveness of communication*** Social awareness Relationship skills ***Self-regulate thoughts and behaviors*** Self-management
SMP 7 — Look for and make use of structure.	Mathematically proficient students ***look closely to discern a pattern or structure***. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7×8 equals the well remembered $7 \times 5 + 7 \times 3$, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2×7 and the 9 as $2 + 7$. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can ***step back for an overview and shift perspective***. They can ***see complicated things***, such as some algebraic expressions, ***as single objects or as being composed of several objects***. For example, they can see $5 - 3(x - y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.	***Understand their strengths and possess confidence or optimism about their ability to look for and make use of structure*** Self-awareness ***Motivate themselves, persist, and regulate against impulses to give up when a pattern or structure is not immediately apparent*** Self-management ***Manage their own progress*** Self-management

Common Core State Standards for Mathematical Practice	Social and Emotional Learning Competencies
SMP 8 – Look for and express regularity in repeated reasoning. Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)(x^3 + x2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students *maintain oversight of the process, while attending to the details*. They *continually evaluate the reasonableness of their intermediate results*.	*Regulate their thoughts to know when organizational strategies are needed (e.g., writing key facts or organizing information on paper)* Self-management **Have a well-grounded and accurate appraisal of their own abilities and work** Self-awareness

About these resources

This document is one of five interrelated resources that articulate correlations and mutually reinforcing commonalities between the social and emotional learning competencies (as described by CASEL) and the Standards for Mathematical Practice (as described in the *Common Core State Standards for Mathematics*).

These resources consist of a whitepaper focused on **making the case** for integrating social and emotional learning with the Standards for Mathematical Practice; a vision **describing an ideal classroom** exemplifying such an integration; and three **instructional guides** for using selected MARS tasks, with special attention to the CCSS Standards for Mathematical Practice and the social and emotional learning competencies. (These MARS tasks can be found on the Inside Mathematics website at http://www.insidemathematics.org/performance-assessment-tasks.)

The resources are:

- Integrating Social and Emotional Learning and the Common Core State Standards for Mathematics: **Making the case**

- Integrating Social and Emotional Learning and the Common Core State Standards for Mathematics: **Describing an ideal classroom**

- Using Social and Emotional Learning to Develop Mathematically Proficient Students: An **instructional guide** for use with **MARS Task: "Conference Tables"**

- Using Social and Emotional Learning to Develop Mathematically Proficient Students: An **instructional guide** for use with **MARS Task: "Printing Tickets"**

- Using Social and Emotional Learning to Develop Mathematically Proficient Students: An **instructional guide** for use with **MARS Task: "Swimming Pool"**

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About the Dana Center

The Dana Center develops and scales math and science education innovations to support educators, administrators, and policy makers in creating seamless transitions throughout the K–14 system for all students, especially those who have historically been underserved.

We focus in particular on strategies for improving student engagement, motivation, persistence, and achievement.

The Center was founded in 1991 at The University of Texas at Austin. Our staff members have expertise in leadership, literacy, research, program evaluation, mathematics and science education, policy and systemic reform, and services to high-need populations.

For more information, see our website at **www.utdanacenter.org**.

About CASEL

Collaborative for Academic, Social, and Emotional Learning (CASEL) is the nation's leading organization advancing social and emotional learning (SEL). Our mission is to make social and emotional learning an integral part of education from preschool through high school. Through research, practice, and policy, CASEL collaborates to ensure all students become knowledgeable, responsible, caring, and contributing members of society. Learn more about our work at **www.casel.org**.

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