

CIRCL Primer: Persistence in Education

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Overview

Perseverance has become part of the everyday language of education. The misconception that intellectual power alone can enable students to succeed in school and life is giving way to a deeper understanding that attaining long-term and higher-order goals can depend so much on how people deal with inevitable obstacles, setbacks, and challenges. This is consistent with extensive correlational research that shows, for example, that conscientiousness (“dependability and will to achieve”) is as closely tied with academic success as intellectual ability (Poropat, 2009); for adults, it is also associated with income, wealth, and life satisfaction (Duckworth et al., 2012).

But what are grit, tenacity, and perseverance, and how can educators create environments and experiences that promote them?¹ While many people think of grit as a personality characteristic that resides within the student with little room to change, the fact is many different factors can contribute to grit—both externally in the environment and internally for the student. There are a variety of programs, approaches, and technologies that leverage different kinds of resources to get students on track with strong goals and support for their perseverance (see Key Lessons). For example, students are more likely to persevere when there is a fair and respectful climate, high expectations, and an emphasis on effort over ability. Technology can also be used to support the perseverance necessary to attain challenging academic goals. One example from the CIRCL community is [the work of Arroyo, Stephens, Woolf, Maloy, Burleson, and Muldner](#), who are exploring new ways that technologies can be responsive to students’ struggles as they learn. There are also important mindsets and skills that students can learn that can enhance their ability to persevere, such as knowing how to deal with specific obstacles when they arise. At the same time, there are some widespread misunderstandings and confusions that can get in the way and even be damaging to students learning to navigate a complex and challenging world (see Issues). For example, overemphasizing grit as a personality characteristic can undermine students’ desire to persevere.

A Working Definition

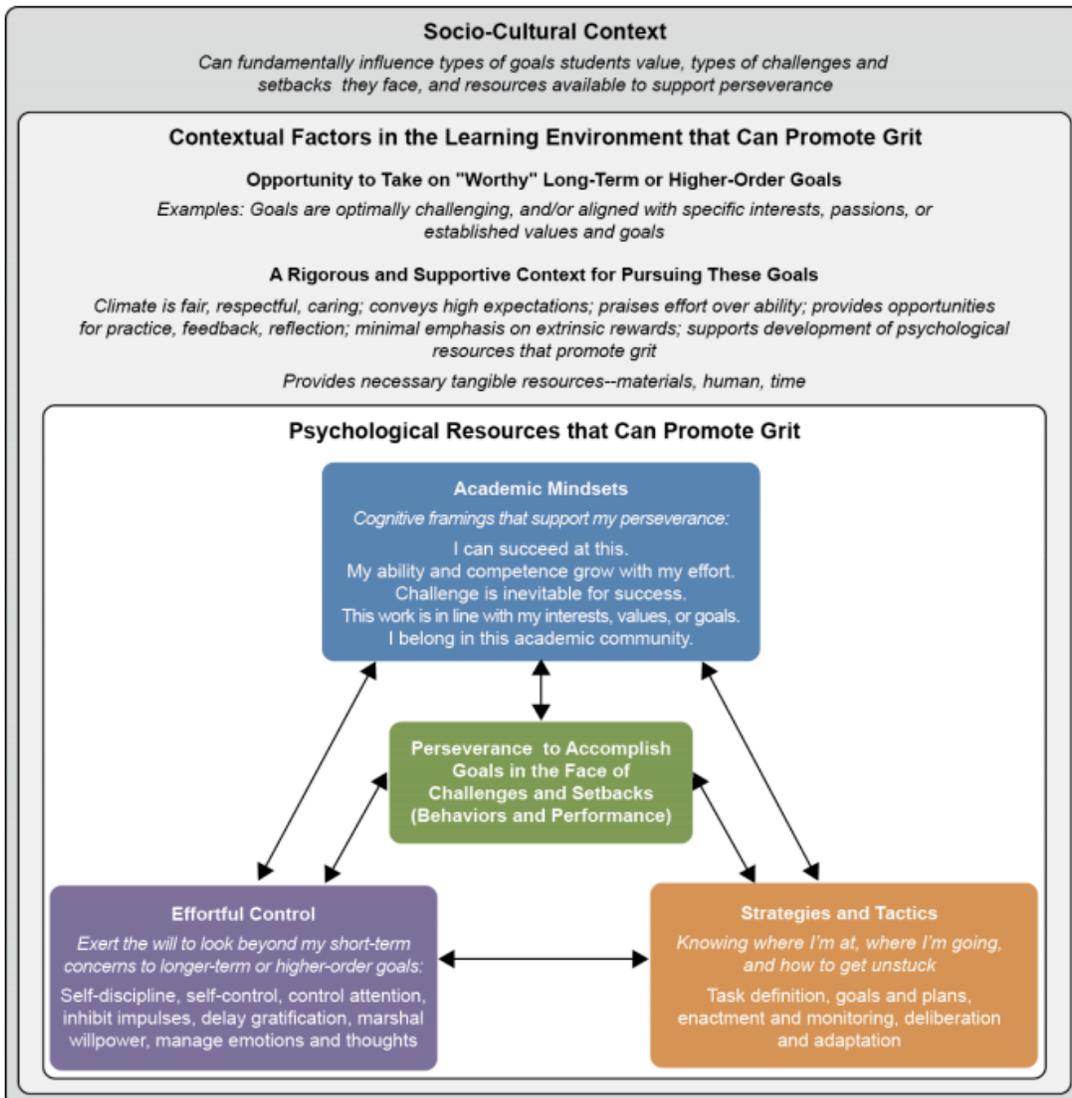
Scholars have put forth a variety of definitions of grit, tenacity, and perseverance, as well as related terms, such as persistence and resilience. From these, for the purposes of our report, we synthesized a definition of “grit”:

¹ This Primer summarizes findings from a report on a broad synthesis of research and practice based on interviews of 27 high-profile thought leaders and reviews of the pertinent research in education and psychology (see Shechtman et al., 2013). To prepare the report, the team also reviewed approximately 50 programs, practices, and technologies intended to promote perseverance in a variety of ways. This was not an exhaustive review, but it revealed key themes in the ways that educators are approaching these issues and suggested ways that digital technologies might be used to expand learning environments to support perseverance.

perseverance to accomplish long-term or higher-order goals in the face of challenges and setbacks, engaging students' psychological resources, such as their academic mindsets, effortful control, and strategies and tactics.

A Hypothesized Model

To support a more coherent understanding, we developed a hypothesized model of factors that can contribute to grit. The factors include qualities of the learning environment, the mindsets and skills that students can learn and draw on, and the broader sociocultural context. The model is intended to provide foundational knowledge to guide practice, research, and policy. We call this a hypothesized model because the research literature does not yet lend itself to a rigorously tested comprehensive theory. The following figure from page 17 of Shechtman, DeBarger, Dornsife, Rosier, & Yarnall (2013) presents the full model.



Key Lessons

The following are some of the key lessons from research and practice.

Learning environments can be designed to promote grit. We identified two core factors (and there may be others). These can be provided by the structure of activities and/or the kinds of practices that educators bring to supporting their students.

- **Opportunities to take on worthwhile goals.** Research provides extensive guidance about what constitutes worthwhile goals; for example, they should be aligned with what students value and be optimally challenging (not too hard, not too easy). Sometimes students may need help understanding why certain goals are worthwhile for them.
- **A rigorous and supportive environment to accomplish their goals.** Research shows, for example, that students are more likely to persevere when there is a fair and respectful climate, high expectations, and an emphasis on effort over ability. Tangible resources are also important—students need appropriate human support, time, and materials to get through challenging tasks.

Students can develop mindsets and skills to help them persevere. Research points to three core types of mindsets and skills, all of which have been shown to be malleable and teachable under certain conditions (see Dweck, Walton, & Cohen, 2011; Farrington et al., 2012).

- **Academic mindsets.** These are how students understand themselves as learners, their learning environment, and their relationships to the learning environment. Mindsets can have a powerful impact on how students behave and perform in the face of challenge. One core mindset that supports perseverance is called the “growth mindset”—knowing that “My ability and competence grow with my effort, strategies, and help from others.” Many studies have shown that students can learn to have a growth mindset, and that this supports perseverance. Other key malleable mindsets that support perseverance are self-efficacy and a sense of belonging.
- **Strategies and tactics.** Students will be more likely to persevere when they are equipped with specific strategies and tactics to deal with the challenges and setbacks they face. They need skills for taking responsibility and being productive under conditions of uncertainty. Students can learn skills such as planning the tasks necessary to accomplish goals, time management, monitoring progress and recognizing problems, knowing how to change their course of action, and dealing with specific obstacles.
- **Effortful control.** Successful students marshal willpower and regulate their attention to stay on track for long-term goals. Research shows that students stronger in these skills are happier and better able to handle stress. Students can learn many different kinds of strategies to regulate their own attention and emotion in ways that help them stay focused, engaged, working well with others, and on track for success.

Sociocultural context can matter. All students encounter difficult challenges throughout their schooling, and contextual factors can support or hinder students’ perseverance in the face of challenge. Factors such as socioeconomic conditions, ethnicity, and gender can all influence the types of goals students want to accomplish, the types of challenges they face, and the resources they have access to.

There are many programs, approaches, and technologies that have been promoting grit in various ways. While there is still a need for evaluation evidence, the following conceptual clusters illustrate some of the many ways leaders are designing learning environments and supporting the development of mindsets and strategies.

- **Preschool and early elementary programs that address executive functions.** Executive functions are key to developing the effortful control necessary to stay on track to accomplish goals. Approaches include training with games, aerobic exercise and sports, martial arts, and mindfulness practices. Many programs have substantial empirical evidence of their success.
- **Interventions that address mindsets and strategies.** Several studies show that brief targeted interventions (e.g., 2 to 10 hours) can help students develop the mindsets and strategies needed to persevere through challenging academic work. For example, mindset interventions may explicitly teach students to have a “growth mindset,” help students understand that struggle is inevitable to success, or provide students with opportunities to affirm their personal values. Strategy interventions may help students clarify their goals, anticipate in advance how to deal with likely specific obstacles, or develop general study skills or metacognitive skills.
- **Alternative school models and school-level reform approaches.** Many schools, charter network organizations, and other kinds of programs are developing new educational models with a deep focus on perseverance. Character education models, project-based learning, design thinking models, and school-level reform programs are key approaches. Such approaches focus on providing good opportunities for students to take on worthwhile goals, resources to build rigorous and supportive environments, and/or explicit ways of teaching critical mindsets and strategies. Anecdotal evidence of these models’ success is extensive, but further research is needed to determine impacts.
- **Informal learning programs.** Many informal learning programs provide the kinds of opportunities that help students develop important long-term goals, provide a support system for getting through school and accomplishing other goals, and opportunities to develop key mindsets and strategies for perseverance. Two important types of programs are those that provide structured social support networks for students who will be first in their families to go to college, and those that provide activities to spark and support interest and persistence in STEM professions. In most cases, there is considerable anecdotal evidence of program success, but further research is needed to determine impacts.
- **Digital technologies and environments.** While technology cannot provide quick fixes for supporting perseverance, there are many ways that it can provide the resources and rigor to help students persevere. For example, the online world provides a wealth of informational resources, organizational tools, and interpersonal networking that can enable learners to persist toward their goals. Also, digital learning environments can provide optimal challenge through adaptivity and scale up ways of promoting productive mindsets and strategies. Some research is beginning to show positive impacts of technologies on supporting both the noncognitive factors associated with perseverance and academic achievement.

Issues

The following major issues have been identified in research and practice. Most of these issues are general across all learning environments with or without technology, as work integrating design elements to promote grit into cyberlearning environments is still just beginning to emerge.

The need to integrate best practices to promote grit within disciplinary learning. This is an important Cyberlearning opportunity. There are a variety of challenges in learning math, science, ELA, and other disciplines. Some of these challenges, such as staying focused and organized through a long project, may require supports, mindsets, or strategies that are domain general. Other challenges, such as those associated with doing complex lab projects or writing papers, may require supports, mindsets, or strategies that are specific to the disciplinary domain. There are many important efforts to integrate practices to promote grit within discipline-specific curriculum and pedagogy.

Potentially damaging misconceptions and misapplications. There is little evidence that grit itself is harmful, but there are some misconceptions and misapplications that can potentially be problematic. For example, overemphasizing grit as a personality characteristic or pushing students to persevere to accomplish goals that are not appropriate for them can undermine their learning, engagement, and well-being. Also, being nice and encouraging to students is important and helpful, but more is needed to promote grit. Practitioners must be mindful of this, yet research offers little guidance. Research in this area will help educators gauge and fine-tune interventions, models, practices, and approaches.

Inconsistency in conceptual terminology as a barrier to collaboration and progress. To advance practice, policy, and research, there is a need to further clarify conceptual ideas and terminology within and across communities. Researchers must be clear about what exactly they mean by grit, tenacity, or perseverance in their own work. More generally, unified frameworks and collaborative activities that bring communities together can help bring clarity that is important to advance research and practice.

More work is needed to understand the transferability of grit across contexts. Are people who persevere in one context more likely to persevere in another? Research is needed to understand how individuals strive to accomplish goals in different contexts, and what mindsets and skills may or may not transfer.

Practitioners and policymakers need actionable research-based advice. While there are many programs and a strong research base, practitioners still need research-based advice about how to use approaches effectively across a variety of settings for a diversity of students. Policymakers need to make informed decisions about how to allocate resources in ways that best support student perseverance. Researchers can help bridge these gaps, for example, by translating technical research findings for general audiences, conducting field-based implementation research that partners with practitioners, and focusing efficacy research on variations across settings.

Moving forward. There are many sources of evidence that suggest that grit, tenacity, and perseverance can be malleable and teachable, and there is great potential to promote grit, tenacity, and perseverance in a deeper way for a wide variety of students. While there are no quick fixes in practice, research, or policy, there are many kinds of small changes that can contribute to incremental progress. There are also some deeper shifts needed in the culture of education that will take coordinated efforts across all communities of educational stakeholders.

Projects

Examples of NSF Cyberlearning projects that overlap with topics discussed in this primer.

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- [EXP: Tenacity: Self-Regulation of Attention and Its Relationship with Learning](#)
- [INT: Collaborative Research: Detecting, Predicting and Remediating Student Affect and Grit Using Computer Vision](#)
- [BCC-SBE/EHR: Developing Community & Capacity to Measure Noncognitive Factors in Digital Learning Environments](#)
- [DIP: Collaborative Research: Impact of Adaptive Interventions on Student Affect, Performance, and Learning](#)

Resources

The following is a selection of programs and organizations associated with each cluster of approaches (see Key Lessons). This list is not meant to be exhaustive, but rather provide a starting place with a variety of approaches.

Preschool and Early Elementary Programs that Address Executive Functions:

- [Tools of the Mind](#)
- [Promoting Alternative Thinking Strategies \(PATHS\)](#)
- [Chicago School Readiness Project \(CSRP\)](#)

Interventions that Address Mindsets and Strategies:

- [Project for Education Research that Scales \(PERTS\)](#)
- [Pathways to Improvement](#)

Alternative School Models and School-Level Reform Approaches:

- [Noel Academy for Strengths-Based Leadership and Education](#)
- [Compassionate Schools Initiative](#)

Informal Learning Programs:

- [College Track](#)
- [OneGoal](#)
- [Girls Inc.](#)

Digital Technologies and Environments:

- [CogMed](#)
- [WOOP](#)
- [Brainology](#)
- [This Is Grit](#)

Readings

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Tough, P. (2012). *How children succeed: Grit, curiosity, and the hidden power of character*. New York, NY: Houghton Mifflin Harcourt.

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