Prerequisites to Learning: Nutrition, Sleep, and Health

Chapter Six

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Introduction

Learning theory is about how students learn. Teachers need to consider how students learn to teach effectively. The principles of learning theory allow us to develop higher-order thinking in our students. They allow us to design lessons that anticipate the developmentally appropriate responses of our students. They allow us to think carefully about how our students think so that we can lead them to academic achievement.

Underlying all of these issues, and all that has been discussed in this text, is the fundamental and simple fact that children have important physiological and psychological needs that are prerequisites to successful learning. How can a first-grader who is hungry really focus on phonemic mastery? How can a student who did not sleep the night before really engage and internalize the concept of the Pythagorean theorem? How can a fifth-grader with a sore throat get the most out of her independent reading time?

As we discuss briefly in the Instructional Planning & Delivery text, Maslow’s hierarchy of needs tells us that intense learning (the kind that translates into closing the achievement gap for our students) first requires the fulfillment of a whole range of basic physiological and psychological needs—needs such as nutrition, sleep, health, and security. While all teachers in all classrooms face challenges related to these student needs at some point or another, in the under-resourced communities and schools where you will be teaching, these basic prerequisites to learning can represent a formidable hurdle for you in your quest for significant academic gains for your students.

As you know, for some of our students, the fulfillment of these needs unfortunately cannot always be taken for granted. You will most certainly encounter students for whom some basic physiological or psychological need is interfering with their learning. One of the many profoundly difficult aspects of being a teacher is deciding when and how to address those basic needs so that your students can access the knowledge and skills that you are teaching.

You see kids with no shoes, without jackets, sick, with glass in their foot, getting beaten up at home. Those kids are not coming through the door thinking about learning, they are coming to school to get basic needs met. Yes, my role is to teach them and lead them to academic gains, but before any of that happens, we have to bring them to a place to be able to learn. The role of the teacher is to meet all of the basic needs of the student as much as possible, because if you can’t, the child can’t learn. If something is outside your locus of control, find the person who has control and do something about it.

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With much gratitude to alumnus Dr. Stephen North, NC ’93 for his help, we have gathered some basic information about some of the physiological and psychological issues that sometimes inhibit children’s learning. We also provide guidance on how to deal with them.

First, we will address some issues that teachers might face with students of any age—malnutrition, sleep deprivation, and illness. As we consider these problems, we will provide specific tips for addressing these problems, both reactively and proactively. Second, we will turn to several health-related issues that are of particular concern for adolescents and their teachers. Again, we will focus on steps that you may take as a teacher to lessen the impact of these problems.

Finally, we will acknowledge the difficult questions this conversation raises about the role of a teacher in the first place by considering the reflections of several teachers who have considered these questions. In some cases, you may decide to help in the prevention of nutrition, poverty, and health-related problems that impact your students learning. In other cases, you may want or need to react to a situation.

This chapter is aimed at providing a better understanding of how and why basic needs can infringe on learning as well as what your role as teacher should be in difficult situations related to such needs. It will also provide a cheat sheet of the numerous potential common problems that your students may face with information on the prevention techniques, warning signs of problems, and steps or resources for handling each situation. Our hope is that in providing this material, we will both make you more comfortable when and if you encounter any of these situations and better prepare you to achieve significant gains in your classroom.

Teachers at all grade levels encounter students whose potential for academic achievement is jeopardized by the students’ poor nutrition, lack of sleep, and/or poor health.

**I. Nutrition**

Researchers have repeatedly found a direct connection between nutrition and academic performance. For example, one study found that morning fasting has a negative effect on cognitive performance, even among healthy, well-nourished children. A test of the speed and accuracy of response on problem-solving tasks given to children who did or did not eat breakfast found that skipping breakfast had an adverse influence on their performance on the tests.\(^{31}\) In a recent New York study, many students experienced malnutrition that was too slight for clinical signs yet still affected their intelligence and academic performance.\(^{32}\) Still another showed that iron deficiency anemia leads to shortened attention

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span, irritability, fatigue, and difficulty with concentration. Consequently, anemic children tend to do poorly on vocabulary, reading, and other tests.

Moreover, similar studies indicate that even moderate under-nutrition (inadequate or sub-optimal nutrient intake) can have lasting effects and compromise cognitive development and school performance. It is well established that children who suffer from poor nutrition during the brain’s formative years score much lower on tests of vocabulary, reading comprehension, arithmetic, and general knowledge.

Incidence of Malnutrition

As new teachers in under-resourced schools quickly discover, the incidence of malnutrition and hunger in this country is astonishingly high. The U.S. Department of Agriculture (USDA) reports that in 2000 10.5 percent of all U.S. households, representing 20 million adults and 13 million children, were “food insecure” because of lack of resources. (“Food insecure households” are those whose members take in enough calories, but have diets of reduced quality that do not meet daily nutritional requirements.) Of the 11 million households that were food insecure, 3.3 million suffered from food insecurity that was so severe that the USDA’s very conservative measure classified them as “hungry.” Over five-and-a-half million adults and over two-and-half million children lived in these hungry households.

Overall, households with children experience food insecurity at more than double the rate of households without children. Geographically, food insecurity is more common in central city households, areas often also affected by a lack of convenient grocery stores. America’s Second Harvest found that their food bank network of emergency food providers served 23 million people in a year (nine percent more than were served in 1997), and more than 9 million of those served were children. You will likely encounter some of these children in your classroom.

Signs of Malnutrition

There are numerous signs that could lead a teacher to suspect that malnutrition may be a concern. According to the Food Research Action Center (FRAC), hungry children suffer from two to four times as many individual health problems, such as unwanted weight loss, fatigue, headaches, irritability, inability to concentrate and frequent colds, as low-income children whose families do not experience food shortages. Hungry children are less likely to interact with other people (including their peers) or explore or learn from their surroundings. The most obvious sign of hunger may be students’ absence, given that hungry children are more likely to be ill and absent from school than their fed peers.

Addressing Malnutrition

While the decision to actually bring food for students is one that many teachers choose not, or cannot afford, to make (see “Teacher’s Role” section below), most schools do have breakfast programs. You may find that you need to take extra steps to ensure that your students are accessing the programs, whether that means talking to parents or bringing that food into your classroom each morning. Research showing that eating breakfast increases composite math and reading scores, improves

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student behavior, reduces morning trips to the nurse, and increases student attendance and test scores only underscores the need for teachers to take positive steps to help ensure their students are well fed.

Proactively—especially in the elementary grades—you may have opportunities to infuse nutrition-related messages into your lessons. Whenever possible, you should share the importance of good nutrition, making connections between nutrition and the academic goals in which you have invested your students. Beyond the numerous resources that your school may already have on nutrition education (ask your administrator), our Toolkit contains a few useful documents and ideas to help guide your nutrition lessons. For a number of nutrition-, health-, and fitness-related internet resources look in the Learning Theory Toolkit (pp. 9-11), which can be found online at the Resource Exchange on TFANet.

While the opportunities may be fewer, nutrition should also be emphasized with secondary students. You may want to integrate nutrition lessons into courses like biology or health. The US Department of Agriculture’s website includes a number of lesson plans that may be useful for secondary students. Students can do research projects on nutrition (or malnutrition) and what it takes to eat well.

II. Physical Fitness

Physical fitness is also a real concern for teachers who want to help their students succeed academically. Recent studies show that providing more opportunity for increased physical activity leads to increased test scores even if that requires reduced class time. Another study indicates that aerobic conditioning may help to improve memory. Exercise may strengthen particular areas of the brain, and oxygen intake during exercise may enhance greater connections between neurons.

Incidence and Signs of Lack of Physical Fitness

One doesn’t have to be a doctor to recognize when a student is not being physically active, and our schools are giving students less opportunity to stay fit. According to the Centers for Disease Control and Prevention, only 29 percent of students attended daily physical education classes in 1999, compared with 42 percent in 1991. Nearly half of young people between the ages of 12 and 21 do not engage in any physical activity on a regular basis.

Among the signs of a lack of physical fitness are obesity, shortness of breath with minimal exertion, frequent fatigue, and lethargy. Lack of physical fitness is also associated with lower levels of self-
esteem and higher levels of anxiety and stress. And, although it has been well documented that being overweight increases the risk for cardiovascular disease and premature death, it has only recently been shown that overweight children achieve lower scores in standardized achievement tests.

**Addressing a Lack of Physical Fitness**

While you can’t make your students go for a three-mile run every day, or watch over what they eat for dinner, you can take some steps to help your students understand the benefits of physical fitness. By teaching nutrition (see "Nutrition" section above), explaining the dangers of obesity, and highlighting the benefits of exercise, you can have a significant impact on your students’ understanding of this health problem. Beyond directly teaching this information, you can avoid the use of junk food as an incentive in your other classroom lessons. In addition, encouraging physical activity through classroom activity, and even making it a reward for success can put exercise in a more positive light for your students. Clifford Berlow, Chicago ‘02, for example, started a sports program at this school that includes boys’ and girls’ basketball.

One objection to recess has been that kids are more disruptive after recess than before. This has resulted in limiting recess time, especially over the lunch hour. Several schools are experimenting with Recess First lunch periods in which the students play outside and then return to the cafeteria to have lunch. This has two effects: lunch becomes a calming transition period, and the pressure to hurry through meals to get the best swing or get on the kickball team is eliminated.

Consider banning junk food from your classroom. Justin May, New Orleans ’00, kept a small supply of healthy snack alternatives in his classroom, and he encouraged his students to “trade up” from junk food to one of his nutritional snacks. By sending strategic messages about nutrition, he found that his students were always interested in trading potato chips for some apple slices.

You should also do what you can to be a good model for your students. Many new teachers serve as coaches at their schools and encourage their students to join teams. You can also talk matter-of-factly with your students about your attempts to maintain a healthy lifestyle. By showing an interest in physical activity (whether as a coach or watching school games), you are modeling the virtues of exercise.

**III. Sleep**

The National Heart, Lung, and Blood Institute (NHLBI) state that children need at least nine hours of sleep per night. For a whole host of reasons, some of your students may not get the sleep they need to stay alert in your classroom. Younger children may sleep in a room with siblings that keep them up, may not have much parental supervision, or may simply not have a comfortable place to sleep. Older students

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*The Problem of Obesity*

One potential manifestation of a lack of physical fitness is obesity, a condition also associated with nutritional problems. While malnutrition often results from a lack of food, it can also arise from overeating the wrong types of food. Malnourishment and lack of physical exercise may therefore manifest itself in obesity. The American Obesity Association recently found that about 15.5 percent of adolescents (ages 12 to 19) and 15.3 percent of children (ages 6 to 11) are obese. The increase in obesity among American youth over the past two decades is at least two-fold. Elementary school students who are obese have a 50% chance of being obese as adults. High school students have a 75% chance of being obese as adults.

The complications of obesity and a lack of physical fitness are even more serious than poor body-image, exhaustion, social stigmatization and discrimination in academics and employment. They can include serious health issues like high blood pressure, heart disease, type II diabetes even for children and adolescents, high cholesterol, and orthopedic problems. Most people, especially students who are constantly bombarded with junk food advertising, do not realize the gravity of obesity and inactivity in terms of these stark health ramifications.
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might be in any of those situations, or might have evening and nighttime jobs that interfere with sleep. Schoolwork itself might be keeping students awake at night, especially when it is put on top of a full load of extra-curricular activities. In other cases, single parents or both parents may be working nights, giving older children some nighttime parenting duties.

Moreover, as we all know, a lack of sleep—especially for young children—can lead to irritability, decreased focus, easy frustration, and difficulty controlling impulses and emotions. School performance usually suffers and behavior is likely to worsen. Sleep, nutrition, and exercise are part of the foundation of a healthy childhood and for academic success.

Adolescents experience similar problems from a lack of sleep, and are probably more likely to carry sleep deficits. Adolescence is a time of important physical, cognitive, emotional and social change when behaviors in one developmental stage are constantly challenged by new abilities, insights, and expectations of the next stage. Sleep is a crucial aspect of adolescent development and is particularly essential during these years. Despite the fact that the need for sleep increases during adolescence, the typical adolescent drastically reduces the time spent in bed at night. By age 16, students are sleeping fewer than 7.5-8 hours per night. Studies have shown that more total sleep, earlier bedtimes, and later weekday rise times are associated with less daytime fatigue, an increased ability to concentrate, less tendency to doze off in class, a less depressed mood, and better grades in school. [The website “Inside the Teenage Brain” provides a good overview of brain development in adolescents.]

Having experienced most of them ourselves, most of the signs of sleep deprivation are relatively obvious—most obvious of all being the fact that a student is really sleepy all the time. Other indicators include increased irritability, weariness, poor attention span, decreased initiative, and decreased motivation - especially for mechanical, inactive tasks and those that require sustained concentration. Memory lapses may also occur. Some students lose their judgment and decision-making abilities. Others may get frequent headaches.

You can affect a student’s sleep patterns. First, as a role model, you should emphasize the importance of sleep and encourage students to sleep more, especially before tests to enhance performance. If you notice signs of sleep deprivation in your students, ask them about their sleep habits and help them understand why sleep matters for their health, mood, and academic success. You may want to send a general flyer about sleep and nutrition home to parents. Also, while visiting your students’ homes, you may want to see where your students sleep to make it easier to discuss their sleep habits with them and why sleeping well and enough is essential to their health and academic success. Encourage parents to keep televisions out of children’s rooms. As with nutrition, physical fitness, and general health, you can have a significant influence on your students simply by consistently emphasizing the importance of sleep to your class’s academic goals.

IV. Health

Students’ health can be a daunting and overwhelming issue for teachers in the classroom. Especially with younger children, runny noses, upset stomachs, lice, ringworm, pink-eye, and chicken pox are relatively common occurrences. Even with older students, teachers have to become adept at navigating the many minor health issues that spring up and at spotting indicators of serious problems.

Of course, you should certainly consult with a health professional if you have any suspicion that serious health problems are arising. Most often, however, you will be witness to a whole range of “minor” health issues—any one of which can dramatically inhibit students’ academic progress.

Dr. Stephen North, NC ‘93, a doctor in Rochester, New York who focuses on school-based health care, assisted us to gather some basic information on the causes, signs, and impact of many of those health issues. To read the tips for teachers who are confronted with those health issues, see the Learning Theory Toolkit (pp. 12-16: “Common Student Health Issues: Causes, Signs, Impact”). Also provided in the Toolkit is a “Viral Prescription” (pp. 17-18) that gives basic information about colds and the flu.

**Addressing Health Concerns**

Children often express feelings of frustration, family strife, or emotional distress as physical illness. Symptoms can vary, but for the most part, they are expressed as stomachaches and headaches. If you have any doubt, however, that a condition may be serious, always err on the side of caution and seek a professional’s diagnosis through the school nurse. Keep in mind that you see your students as much as their parents and infinitely more than their physicians, and you therefore may be one of the most likely adults to observe rapid or gradual changes in physical appearance, mood, and attitude that might be signs of health problems.

Your school nurse will also be an excellent resource for gaining understanding about what conditions and diseases are prevalent in your school, and as you learn more about your students and their families you will begin to develop a better understanding of what influences their health. For example, teachers learn that children with significant stressors in their families have a 40% greater chance of developing illnesses like strep throat.

While determining why a student is sick may not be your role, by being aware of the environments in which your students live you will get a better understanding of the risk factors they face. Asthma is one of the leading causes of school absences and children’s visits to the hospital, and according to Dr. Jean Hanley-Lopez of Los Angeles County + University of Southern California (USC) Medical Center, the illness is disproportionately prevalent among children in high-poverty urban environments, with cockroaches, mice and leaky roofs as potential triggers. University of Maryland Medicine reports that up to 20 percent of Baltimore City children are asthmatic, as opposed to the national average of seven percent. To combat this problem, Los Angeles, Baltimore and several other major cities now boast fleets of “Breathmobiles,” customized motor homes that visit schools and provide diagnosis, treatment and medication for children and families at no charge. Staff members aboard the Breathmobiles aim to educate the public about the causes of asthma and show children how to control the illness and take

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43 [http://www.4children.org/news/7-97asth.htm](http://www.4children.org/news/7-97asth.htm)

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medication regularly. The professionals also explain the value of bedding encasings, which can significantly reduce the number of dust mites living in the fibers of quilts and mattresses.

Another one of the greatest risks to students’ health and long term learning potential is lead poisoning. Typically this is found in older housing stock in urban and rural areas. Lead-based paint used on areas with high friction [e.g., window jambs] flakes off and releases lead into the environment, which ends up being ingested. Recent research demonstrates that even low lead levels can result in a decrease in IQ over a long period of exposure.

More proactively, all teachers can address health concerns by emphasizing nutrition and physical fitness with their students. Teachers can reinforce the importance of and diminish the fear of going to the doctor. Elementary teachers in particular should model and teach good hygiene. Children should be taught and reminded to wash their hands, use tissue paper for runny noses, etc. Some teachers, for example, have toothbrushes labeled and ready for students after lunch.

Teachers may also be the first adult to recognize signs of mental health issues in a student. Depression and anxiety are the two most common mental health issues faced by children in the United States. Two to five percent of grade school students and as many as 8.3% of adolescents suffer from depression.

Recognizing depression in children and adolescents is difficult because it does not always present with the same signs and symptoms as adult depression. Instead of being withdrawn and sad, adolescents with depression are often irritable, anxious, and or angry. They also have an increased rate of other serious problems such as anxiety, substance abuse and disruptive behavior. Other common signs of depression include drastic changes in peer groups, increases in incomplete assignments, and changes in eating habits.

V. Health Issues for Adolescents

Of course, all of the concerns discussed thus far—malnutrition, lack of physical fitness, sleep deprivation, mental and physical health—apply to elementary and secondary students alike. Adolescents’ academic success is equally compromised by hunger, headaches, and sleepiness. Complicating matters, adolescents often do not like to seek attention for their medical problems for a variety of reasons. They may view a doctor’s office as something for little kids, they may be experiencing embarrassment about the physical changes of puberty, or they may have encountered physicians who simply did not relate well to them.

Reporting Child Abuse

As a teacher, you are required by law to report all suspected child abuse and neglect cases (as are police officers, physicians and registered nurses). Physical indicators of child abuse may include unexplained bruises or welts that suggest the use of an instrument, unexplained burns, torn or bloody clothing, and difficulty sitting or walking. You must report not only your suspicions, but also any statements from a parent, guardian, custodian or other person legally responsible for the child that, if correct, would indicate that he or she had been abused.

If you suspect child abuse and you don’t report it, you may be subject to disciplinary action by your school district; civil liability for all damages inflicted upon or suffered by the child and caused by your failure to report; and criminal charges punishable by jail time and or a fine.

For more information, explore some of the following websites:

http://child-abuse.com/
http://www.ndacan.cornell.edu/
http://www.childhelpusa.org/
At the same time, adolescents are uniquely susceptible to a number of health related concerns, all of which can raise obstacles to your teaching and their learning. Unfortunately, drugs, teen violence, smoking, unplanned pregnancies, and eating disorders are just a few of the real risks that young adults face. If you are teaching these students, you will no doubt share their concern about these risks. As their teacher and leader, you are in a unique position to influence their decisions and should take full advantage of that opportunity. You might consider journal or other writing assignments to explore with your students the long-term risks of drug use. You might use historical lessons about inspiring individuals to push students to think beyond the immediate time-horizon about their own lives and futures. You might use a unit on persuasive language to deconstruct the subtle and not-so-subtle messages that advertising sends us and how those message might affect people’s body image. Two excellent resources for information about adolescent health are the National Institute of Health’s Teen web site45 and TeensHealth.46

VI. Homelessness

Nearly one million children in America are currently homeless.47 The causes are deep and varied, but national organizations frequently cite declining wages, the lack of affordable housing and the decrease in public assistance as major contributing factors. In every state, metropolitan area, county and town in the U.S., more than the minimum wage is required to afford a one- or two-bedroom apartment at fair market rent, according to the National Low Income Housing Coalition.48

School-age children who are homeless face many barriers to attending school, such as missing necessary paperwork or immunization records, failing to meet residency requirements, and lacking transportation, adequate clothing and supplies. Homelessness often breaks up families; shelter policies sometimes deny access to older boys or fathers, or parents may place their child into the care of a friend or relative. Students may feel abandoned or despondent. According to the Massachusetts Department of Education, it may take four to six months for a child who is homeless to get acclimated to a new school. Researchers James Stronge and Karen Hudson offer a child’s point of view:

Try to imagine the trauma of being homeless. You may be sleeping in a car or living in one temporary shelter after the next. Perhaps you simply do not know where you are going to sleep. If you are homeless, it would likely mean moving to strange cities or neighborhoods, not knowing your neighbors, and losing track of friends and family. It would mean becoming rootless, and if you were school age, explaining to classmates why they can’t come over to your house to play.49

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Of course, there is no one “homeless child.” The federal definition of homelessness not only includes children sleeping in a shelter, a car, or a park, but also those awaiting foster care placement, temporarily living with friends of the family due to loss of housing or economic hardship, staying in a motel, and other transient arrangements. The public – and, potentially, school personnel – often are unaware of the diversity of circumstances among the homeless, an ignorance that can curb access to the care that children need.

The McKinley-Vento Act, reauthorized in January 2002, requires school districts to keep children who are homeless in their school of origin [to the extent feasible] unless a parent or guardian authorizes otherwise. This means that students who become homeless and move outside the district’s limits may still be eligible to attend their original school, and the Act further mandates for transportation to be provided. If you have a student in your class who is homeless, you can help him or her fill out appropriate forms by making yourself aware of McKinley-Vento, as well as the policies mandated by your State Coordinator for the Education of Homeless Children and Youth. For websites that help you identify resources for children who are homeless in your community, see the Learning Theory Toolkit (p. 22), which can be found online at the Resource Exchange on TFANet. Every school district is required to have a liaison for students who are homeless.

In addition, McKinley-Vento requires school districts to enroll students who are homeless and new to the area, even if these children do not have required documents, such as medical records or proof of residency. You can reassure students or parents who are forced to move far away because of homelessness that they are legally entitled to immediate access to education in their new district.

Beyond being familiar with your students’ rights and with community resources, educators recommend in-classroom strategies to help students who are homeless overcome the obstacles to their success:

- **Think through the supplies you require students to use.** Students may not be able to obtain the materials necessary to make that volcano for earth science class, or have the space in which to store it. Secure supplies and give plenty of lead-time on complicated assignments so students have time to work on the project in your classroom after school, if necessary. Arrange assignments so students don’t have to keep things at home, and when planning projects that involve the television or a computer, have alternative options or a way for all children to access that technology at school.

- **Tend to emotional needs.** Children who are homeless are in particular need of affirmation, belonging and an outlet for sharing their feelings. Get students involved in the running of the classroom as soon as possible by assigning responsibilities, such as serving as an attendance monitor or another type of assistant. Build social networks among students by creating cooperative groups, where appropriate, and provide safe opportunities for students to express their emotions and to solve problems.

- **Create peer awareness.** Curtail potential misconceptions and stigmas by educating your class about homelessness through social studies lessons or the use of literature. Eve Bunting’s *Fly Away Home* (grades 1-3), Jerry Spinelli’s *Maniac Magee* (grades 4-7) and Gary Paulsen’s *The Crossing* (grades 8-12) are recommended reading.

- **Be persistent and build persistence.** In the research about building resilience in children, successful teachers involve students in decision-making, use students’ strengths and dreams as starting points to build motivation and emphasize to students that adversity is not permanent. They also find ways to
keep students in school. Keep track of attendance, and let returning students know that you missed them in their absence. Collaboratively brainstorm ways that can enable them to get to school regularly. Resilient children often credit their success to an adult that took a special interest in them. The National Coalition for the Homeless notes that education is the key to ending the cycle of homelessness. Caring, committed teachers can play a vital role in this process.

Conclusion and Key Concepts

Although a teacher is not necessarily responsible for his or her students’ health, a teacher is responsible for student learning. Sometimes, you will find factors in your students’ lives which impact their ability to learn and you—as a teacher concerned with your students’ achievement—must help find solutions to those problems that are in the way of your students’ success. To paraphrase Justin May, a 2000 New Orleans corps member who led his students to significant academic gains—

If a student needs a jacket, it is within your control to go to lost and found and find him one. If your student oversleeps, it is within your control to call him to wake him up. If a student has bad breath, don’t complain to other teachers about it—get a toothbrush and put the student’s name on it and help him use it at school. If a student can’t see well, help his parents find a clinic to get an eye exam. There’s a lot that’s within your locus of control.