



Inactive Brains: An Interrupted Case Study



by

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Part I— A Concerned Community

Mark Glanston, MD, and Chris Kent fidgeted in their chairs, fighting a burning desire to leave the building. In a few minutes they would present to an audience of troubled parents, students, and the mayor. They were both seasoned speakers but something about this talk made them uncomfortable.

They had been invited to tonight's town hall meeting to help resolve and vote on an issue that had plagued the local county school district for some time. Last year the school district received a government grant worth \$5,000,000 as part of the "The Improved School Programming Initiative" (ISPI). Through this initiative government funds are used to support educational programming, resources and curriculum in inner-city elementary schools and high schools. The grant stipulated that the money was to be distributed among five schools in the district and could only be used for one distinct program. The district was located just outside the city limits of a major metropolitan area. The average annual salary in the county was \$20,000–\$50,000 among predominantly single-parent families, a majority of which did not have access to health benefits.

School administrators and local school officials felt that the most cost-effective use of the money would be to install new science laboratories and state-of-the-art science-related equipment to initiate a competitive science curriculum. City council and school officials argued that in order to raise the level of academic performance and aptitude of the students in the district there was a great need for improved science programming and resources. Their argument was further supported by recent data demonstrating that students who possess a high-quality foundation in science were more likely to go on to secondary education.

Contrary to this viewpoint parents maintained that childhood obesity was prevalent in the school district, a condition that mirrored the state of the nation. The parents argued that the study of science would not suffer if there were competent and resourceful teachers in place. The parents wanted the school board to have the Centers for Disease Control (CDC) help with a School Health Index (SHI), a CDC assessment tool that examines a district's level of involvement and support in each of the eight components of a coordinated school health program. A coordinated school health program includes: health education, physical education, healthy school environment, school health services, nutrition services, guidance, counseling and psychological services, health promotion for staff, and family and community involvement.

"One does not necessarily need the most sophisticated equipment to foster a good foundation in science," said Gloria Wathrop, a concerned parent and the head of the local parent-teacher association. "What we have now is fine," another parent said. Gloria continued, "We are here today because we are troubled by the fact that our children have no physical outlet. Therefore, the parents want the money to be used to improve the physical education programs and other programs that would promote health and wellness. Currently there is no organized physical education program and recently several of the children within the district have been treated for Type II diabetes and high blood pressure. One of those treated is my child!"

After more heated discussion, order was restored to the room. Mark stepped up to the podium first and gazed out over the anxious faces.

Questions

1. Why might this case have been entitled "Inactive Brains"?
2. What might be the purpose of Mark's presentation?

Part II—Mark’s Presentation

Mark cleared his throat and began.

“Obesity is an epidemic that needs to be addressed. It poses a challenge to the prevention of non-communicable diseases throughout the world.^[1] Over 15% of the nation’s children are obese.^[2] This is not something that we can shy away from. A staggering 80% of obese children grow into obese adults,^[3,4] so what you do as parents has a significant impact on how your children behave inside and outside of your home. Specifically, your children are at an age where their nutritional and social behaviors are formed and solidified by daily influences and peer associations they develop. It is at this time that the prevalence of other diseases related to childhood obesity such as heart disease and diabetes becomes evident.

“Let me tell you a personal story. As you look at me today, a 6 foot 190 pound man, you would never think that at one time I was an obese child. When I was 12 years old I weighed 235 pounds and I only stood 5 foot 6 inches. This was a difficult challenge for me. My peers ostracized me and I was excluded from many social and athletic events because of my size. My cholesterol was in the moderate risk range (>220 mg/dl) and I would often become short of breath upon light exertion. Now I am 50 years old and if I had not drastically changed my behavior as an adolescent I might not be standing before you today.

“In my research as a physician I see a large number of obese children diagnosed with Type II diabetes, a disease often found in adults 40–50 years of age. We also know that diabetes is highly correlated with disease of the coronary arteries, which is the leading cause of death in North America. Although it is true that the data support a genetic link to childhood obesity, it is becoming clearer that there are several controllable factors to help prevent it from occurring in children and adolescents.

“Just a few facts for you: did you know that 26% of American children watch at least 4 hours of television each night?^[5] That means that most of their evening is spent sitting in front of a non-interactive box. BMI or body mass index, a measure of the relationship of height and weight, is lower in children who watch less than 2 hours of television per day.^[5] But the blame does not lie squarely with the commercialism of our society. Rather some of the blame is right here in this room. Out of 4,500 children ages 9–13 and parents that were surveyed in communities just like this one, 61.5% did not participate in any type of organized physical activity.^[6] Additionally, only 8% of elementary schools, 6.4% of middle schools, and 5.8% of high schools provide daily physical education for all grades for the entire year. Further, 40% of states in the nation allow exemption from PE.^[7] There are no similar exemptions from any other class—not even homeroom! These are the facts. What are we going to do about them?

“The message here is that childhood obesity is serious, more serious than we ever thought. It is ruining our children and destroying our future, not to mention the drain it is placing on our healthcare system. Something needs to be done—and quickly. We need to focus on prevention as opposed to treatment. We need to ask ourselves as a community: What do we need to do to combat this significant issue?”

Mark left the lectern to the applause of parents and students. However, the city council and school officials were not too pleased with what he had said.

Questions

1. Why is obesity an epidemic among American children?
2. How are some of the health conditions presented by Mark related to childhood obesity?
3. To what extent should the responsibility for childhood obesity be assigned to the individual or to society?
4. What are some of the strategies that can be implemented to combat the obesity issue in the local community?

Part III—Chris' Presentation

Chris now approached the lectern, adjusted the microphone, and began.

“Thank you, Mark, for that heart-felt presentation. I know how important this issue is to you, and to all of us. But I would like to look at a different way of approaching such problems; a more indirect way perhaps. I want to talk about how science education (including science and mathematics and technology) can produce students who are better citizens and who will therefore create a better world—including, of course, a more healthy and fit world.

“Science education develops understanding and habits of mind that enable citizens to keep open minds and to face problems head on.^[8] We have spent so much energy trying to create students with strong self-esteem, in spite of their lack of hard knowledge. Have we done enough to arm them to face the problems of today, which are global in nature and deal with scientific reality? We cannot solve problems like global warming or terrorism by basking in self-esteem. We cannot discuss issues like abortion or cloning and stem cell research any better for having great physical prowess like the ancient Romans. We need the discipline of the scientific method, the caution of critical thinking, the realism of the experimental method. It is time to get better at reality testing so we can deal effectively with problems that are all too real.

“So, how have we been doing with science education? Bill Gates recently complained that US high school students placed 24th out of the 29 industrialized nations taking an international mathematics test.^[9] We cannot compete with other nations on practical knowledge. Our scientists have been under direct attack by political interests, something that would be unimaginable if the populace understood the tools and benefits of the scientific approach. Junk science and quack medicine fill our late-night television commercials.

“The message here is that our lack of scientific literacy is more serious than ever. Junk science and superstition are poisoning and holding back our students from developing their minds, which will master their bodies. We need to tackle this problem quickly, to become competitive on a global scale and to become wiser and more effective citizens.”

Chris left the lectern to the applause of the city council and the school officials. However, this time it was the parents and the students who were not too pleased with what had been said.

Questions

1. Why is the scientific method so poorly understood in today's America?
2. How are some of our social problems related to an impoverished appreciation for science and the scientific method?
3. To what extent should the responsibility for this naivety and credulousness be assigned to the individual or to society?
4. What are some of the strategies that can be implemented to combat the issue of scientific literacy in the school district? Is expensive and constantly updated equipment necessary?

Part IV— The Final Decision

As Mark and Chris waited for the town hall meeting to continue, they had a moment to reflect.

Mark's thoughts:

Mark had simply presented the facts without any manipulation. As a physician/researcher, Mark appreciated more than most the need for intervention to challenge the underlying problem of childhood obesity in the community. Furthermore, he was empathetic, having gone through it himself.

But Mark was a scientist and he understood the need for scientific foundation in education. When he was a 235-pound adolescent he loved science and he would have given anything for state-of-the-art resources. To miss the opportunity to build a wonderful, resource-rich science program would be a shame. His foundation in science eventually led him to medical school. Without that nurturing he would never have become such a successful physician/researcher.

But without the grant money, the schools would never have a physical education program of any substance. How could he stand up there and pontificate about the childhood obesity issue and how it was ruining this country while being torn by the fact that the opportunity to improve scientific education in the district might slowly be slipping through his fingers?

Chris' thoughts:

Chris had presented the other argument clearly. He too had avoided manipulation and the ideas he presented were generally accepted. However, Chris was also ambivalent. As a former athlete, he appreciated more than most the lessons of teamwork, responsibility and self-discipline that could be learned through physical education.

Chris would have loved to have had a more affluent program in gymnastics as a high school student. There had never been a moment of regret for the athletic scholarship he had received, sending him to a top school and leading to a successful career in fitness research.

But without the grant money, the schools would never have a serious science program. One could get in shape with a simple jump rope if necessary, but there was no way to “get by” with basic equipment in the rapidly evolving field of technology.

Upon the sound of a gavel, both awoke from their inner discussions. A vote needed to be made to move a proposal forward. Neither alternative would come without a price. Mark and Chris were well aware of the price, but were they willing to accept it?

Questions

1. As a member of the school district, how would you vote?
2. What are some of the possible consequences of that decision?
3. Now that you have finished reading the case, reconsider why the authors might have chosen the title “Inactive Brains.”

End Notes

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Note: Although the situation presented in this case study is intended to be realistic and the data in Parts II and III are accurately reported, the characters, program (ISPI), and school district are fictional.

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