Education: the world, the United States and Indianapolis

Rachel Ogorek[2]

Abstract: *One of the current societal issues plaguing America is the downfall of America's public education system. On national, state, and local levels American students struggle to remain competitive in a global market. Students that come from minority and lower socioeconomic backgrounds are even more at risk of being able to compete in an ever-competitive job market. While there is not a one-size-fits all approach to solving this crisis, one promising solution involves increasing access to Science, Engineering, Mathematics, and Technology (STEM) education; especially for minority and underserved student populations. This paper briefly examines examples of successful STEM programs in other urban areas similar to Indianapolis as well as one successful STEM school in Indianapolis.*

---

[2]Rachel Ogorek is currently pursuing her Masters in Public Administration in Nonprofit Management at the School of Public and Environmental Affairs as well as her Masters in Philanthropy at the Lilly School of Philanthropy at IUPUI.

.

In 2009, students from the United States participated in an international education test given by the Programme for International Student Assessment (PISA), which is a part of the Organisation for Economic Co-operation and Development (OECD). This organization administers tests to 15-year-old students in multiple nations. Fifteen-year-old students have the most similar curriculum internationally of any age and thus provide the most closely related skill sets to be able to test standards in international education across the board (Wilkens, 2011). Student performance is measured in mathematics, science, and reading. The test was first performed in 2000 and repeated every three years. It is given to collect data on student performance so that education policies and outcomes may be improved. "The data has increasingly been used both to assess the impact of education quality on incomes and growth and for understanding what causes differences in achievement across nations" (Hanushek & Woessmann, 2011). In 2009, 470,000 15-year-old students representing 65 nations and territories participated in PISA (OECD, 2012).

Out of the 34 developed countries that took this test, the United States scored fourteenth in reading, twenty-fifth in math, and seventeenth in science (Neil, S., 2011). While these facts are disheartening, they are even more alarming when the amount of education money spent per individual is calculated. According to the United States Department of Education in 2008, the U.S. spent $10,441 per student. In 1971, the U.S spent $4,552 per student (These monetary values account for inflation) (U.S. Department of Education, 2012). The United States spends more per student on elementary and secondary education than all but three other countries: Luxembourg, Switzerland, and Norway (Ripley, 2010).

In spite of the fact that America has more than doubled the amount of money it spends on education, the United States continues to lag behind in academic performance in multiple

categories when compared to other nations (Education Olympics, 2012). Not only does the Unites States score below average or average on the PISA test, results indicate that academic achievements for American students have remained stagnant for many years while student achievements in countries like Latvia, Chile and Brazil have made gains in academics three times faster than American students (Hanushek et al., 2012). Students in Portugal, Hong Kong, Germany, Poland, Liechtenstein, Slovenia, Colombia and Lithuania have improved academically at twice the rate (Hanushek et al., 2012). This is distressing given the amount of money, time, policies and energy that are put into the American educational system.

The Council on Foreign Relations compiled a U.S. Education Reform and National Security Task Force. Led by former New York City schools' Chancellor Joel I. Klein and former U.S. Secretary of State Condoleezza Rice, the task force found **"**The United States' failure to educate its students leaves them unprepared to compete and threatens the country's ability to thrive in a global economy. Educational failure puts the United States' future economic prosperity, global position, and physical safety at risk" …[the country] "will not be able to keep pace—much less lead—globally unless it moves to fix the problems it has allowed to fester for too long" (Klein et. al., 2012). Given these dire warnings, what can the United States do to ensure that it is able to maintain its ability to compete globally in the future?

It is clear that education in the United States needs improvement. One individual working tirelessly to see that the United States maintains its competitive edge is Eric Alan Hanushek. Hanushek is a Paul and Jean Hanna Senior Fellow at the Hoover Institution of Stanford University and an expert on educational policy and the economics of education. He and his colleagues know that as a whole our nation is in trouble; only six percent of students in the United States perform at the advanced-proficiency level in mathematics. American students rank

behind children in 30 other countries ranging from the United Kingdom to Taiwan (Ripley, 2010). Hanushek and his colleagues broke down each state and compared them to the rest of the world's educational rankings in mathematics as if they were their own separate countries. The goal was to see if any American students competed at the top of the rankings (Hanushek et.al, 2012, Is the U.S. catching up). Sadly, no individual state even entered the top ten. The highest performing state, Massachusetts, came in at number17. The highest achieving students in Indiana rank 42 places behind Massachusetts and 12 places behind the United States average (Peterson, 2010).

When education achievements in Indiana are broken down into cities, Indianapolis fares much worse than the top performing students in Indiana. Indianapolis schools have been under scrutiny for some time now and they have tried multiple reforms to reign in their abysmal graduation rates. In 2007, Indianapolis had the second worst performing school district in the Midwest, coming in just ahead of Detroit (Biddle, 2012). Indianapolis Public Schools face a significant number of problems and produce a disproportionately lower number of graduates than the rest of Indiana and the United States at large.

In 2005, Indianapolis Public Schools began implementing Promoting Power initiatives. Promoting Power compares the number of twelfth-grade students in a school to the number of ninth grade students three years earlier. This is designed to estimate the proportion of high school students who make it to their senior year (Promoting Power Faq's, 2013). Between 2005-06 and 2010-11, the five-year graduation rate in Indianapolis Public Schools declined from 41 percent to 38 percent even with the district's Promoting Power initiatives (Biddle, 2012). In 2008 only 48.6 percent of students graduated from Indianapolis Public Schools (Profile for Indianapolis Public Schools (School District), 2012). The percentage of Indianapolis public high school students

taking Advanced Placement courses declined from 2.4 percent in 2006-07 to 1.4 percent in 2009-10, according to the U.S. Department of Education's Civil Rights database (Biddle, 2012). Another measure for high academic achievement is the International Baccalaureate Diploma Program. This program is an intense curriculum for high school juniors and seniors, with an emphasis on intercultural understanding and enrichment (What Is the International Baccalaureate, 2013). Only 10 students in the entire district took International Baccalaureate courses in 2009-10 (Biddle, 2012).

These negative statistics have brought attention to the turmoil in Indianapolis schools. There appeared to be some success in graduation rates as Indianapolis Public Schools reported a graduation rate of 64.6 percent in 2011 (Elliot, 2012). However, this was quickly denounced because of a waiver system. Every year high school seniors are required to take algebra and English standardized tests indicating that they are proficient in these subjects so that they may graduate. Students must receive a score of at least 51 percent to obtain their diploma. A waiver system was implemented to allow students who are not able to pass the state-required algebra and English tests to receive a diploma even though they do not meet basic proficiency requirements.

"Statewide, approximately eight percent of students in 2011 received such diplomas. But in Indianapolis Public Schools, that percentage was a startling 26.7 percent — a percentage that has been increasing over the past few years" (Moxley, 2012). Without waiver diplomas, the graduation rate in Indianapolis Public Schools would be 47.3 percent - slightly below their 2009 overall graduation rate of 48.6 percent. The implications of this are far reaching. This means that in the last five years, in spite of all the time, discussion, and resources dedicated to education reform, nothing has changed. In fact, graduation rates have become worse and students are even

less proficient in basic writing, reading and mathematics skills. Also, minority students are falling further and further behind. Almost one third of black students received a waiver diploma. One in seven Indianapolis students who receive free or reduced-price school lunches (a common measurement of socioeconomic status) received waivers. Hispanic students also received waiver diplomas at a rate of one in seven. In contrast, just one in 20 white students received waivers to graduate from Indianapolis Public Schools (Moxley, 2012).

Different reforms and solutions have been suggested to remedy this education crisis. One of the most touted reforms is to give more money to poor minority schools. While it is true that there are often significant socioeconomic disparities between urban city schools and their suburban counterparts, research has shown that money has very little to do with student performance, teacher engagement, and overall school academic ranking. While Stanford economist Eric Hanushek and his colleagues were conducting one of their education studies comparing individual states in the global educational rankings, they found that the list of countries that spend the most on education has little in common with their educational ranking. This also stays true on state levels. For example, in 2008 New York spent $17,000 per student and still came in behind 15 other states and 30 other countries listed on Hanushek's educational ranking list (Ripley, 2010). While money can play a role in educational outcomes, it is clear that there are other factors that have a larger effect on student success.

On the district website, Indianapolis Public Schools lists its mission as being able to "prepare and empower all students for life." Indianapolis Public Schools' vision is to be "the flagship in innovative urban education, preparing all students to be successful in the global economy" (About Indianapolis Public Schools, 2013). While these are admirable goals, Indianapolis Public Schools have a long way to go to accomplish them. My first suggestion for

moving toward providing students an education with a global perspective is to adopt 21st

century learning skills and initiatives.

In the publication *Digital Transformation: A Literacy Framework for ICT Literacy*

(2007), the Educational Testing Service defines 21st century learning skills as the following:

 * The ability to collect and/or retrieve information,

 * The ability to organize and manage information,

 * The ability to evaluate the quality, relevance, and usefulness of information,

 * The ability to generate accurate information through the use of existing resources.

(Digital Transformation, 2012).

Accomplishing these goals can be challenging but Partnership for 21st Century Skills,

(P21) is "a national organization that advocates for 21st century readiness for every student. P21

is a broad coalition made up of education nonprofits, foundations, and businesses working

together to make 21st century education a reality for all students" (Partnership for 21st Century

Skills, 2012). This organization is available to help administrators, teachers, staff, and students

accomplish these goals so they are able to compete on a global level. Partnership for 21st Century

Skills provides multiple methods and resources available to teachers so that they can integrate

skills into their current classroom assignments. There are practical ways teachers can apply 21st

century concepts within their classroom without significantly impacting current heavy

workloads. Even small classroom changes that add 21st century skills can help students leave

school more prepared for college and the job market.

One of the most efficient ways to implement these skills in the classroom setting is to

teach the "four C's": critical thinking and problem solving, communication, collaboration, and

creativity and innovation (Preparing 21st Century Students for a Global Society, 2012). These

skills not only work in subjects like math, science and English, but they prepare students for the job market. More and more jobs require a higher skillset and an ability to think critically. To keep American workers competitive, students need to excel at the four C's skills. Integrating these skills into the classroom setting is easier if they can be worked into an already established curriculum. Science, technology, engineering, and mathematics curricula, commonly referred to as STEM, provide a natural pathway for integrating the "four C's" into the classroom.

Over the past few decades, educational initiatives involving science, technology, engineering, and mathematics curricula have risen, and policies have been made to implement STEM in the classroom. This change has taken place because experts realize how far the United States has fallen globally. STEM schools have proven their effectiveness around the country, and many cities have seen their students' success rates increase when STEM practices are brought into the classroom.

In Maryland, Baltimore Public Schools are attempting to revolutionize the way urban education is perceived. The city has assembled a number of "choice schools" so every student has the option to attend the school of his or her choice. Sixteen of the schools within the district are STEM-focused schools, and more are slated to open in the coming years. Students at every STEM school are held to high academic standards. The success of STEM-focused schools is dependent upon several factors. Strong partnerships with universities and industries that work in science, technology, engineering, and mathematics are particularly essential to the success of STEM students (STEM-Focused Schools, 2012).

Andrés A. Alonso, CEO of Baltimore City Public Schools, had this to say about the STEM curriculum, **"**Ultimately, the 'real world,' hands-on aspect of STEM-focused schools resonates with many students because it underscores the connection between school work and

their future interests and careers. The increased engagement is evidenced in the schools'

popularity: of the five high schools in most demand, four are STEM-focused" (STEM-Focused

Schools, 2012)

As the United States monitors the success rates of Baltimore Public School's STEM

programs, other STEM programs have already proven their value, especially among minority and

disadvantaged students. The study *Science, Technology, Engineering, and Mathematics (STEM)*

Pathways: High School Science and Math Coursework and Postsecondary Degree Attainment

found that black and Hispanic students who take high level courses in high school are as likely as

their white counterparts to pursue STEM degrees in post-secondary education. The more

opportunities black and Hispanic students have to study STEM-based curriculum in high school,

the more likely they are to pursue STEM-related careers in the future. This increases overall

success rates and economic opportunities for minority students in the future (Borman, K., Et. Al.,

2007).

One city that has seen considerable success in their use of STEM curriculum is Camden,

New Jersey. Dr. Gloria Bonilla-Santiago is the founder of the LEAP University Academy

Charter School in Camden. In spite of the many urban educational challenges they face, 100

percent of their senior students graduate and go on to college. In an article for *U.S. News*, Dr.

Santiago wrote about her experience with STEM programs and why they should be replicated

throughout the United States:

> *Here's a heads up to some of the most dangerous cities in America: Detroit, Memphis,*
>
> *Lubbock, Tallahassee. Despite your problems--too many low-income residents, too much*
>
> *crime--it is possible to help children in your communities break the cycle of poverty. And*
>
> *all it takes is convincing adults to care and believing that poor kids can take an interest*

in STEM (the acronym for Science, Technology, Engineering, and Math education). Let me explain. The LEAP Academy--a charter school I founded in dangerous and impoverished Camden, N.J.--began its own STEM curriculum last year. Why STEM? Because this is where we know the jobs of tomorrow are. And people in inner cities need opportunities... The supply of open jobs is exceeding the number of qualified professionals to fill them. Technology is already influencing every single career out there. A few fields--computer science, engineering, environmental science, and medicine--are already experiencing serious imbalances. Meanwhile, there is the issue of global competitiveness. America needs to keep pace if we hope to remain a leader in the global economy. Add it all together, and you have the formula for opportunity (Bonilla-Santiago, 2011).

Indianapolis Public Schools fall into the demographics Dr. Santiago speaks about. In 2011, 81.1 percent of students in Indianapolis Public Schools received free or reduced lunch (Profile for Indianapolis Public Schools (School District), 2012). In the district, 70.8 percent of students belong to a minority group and 11.8 percent of students are English language learners (Education Budget Project: Indianapolis Public Schools, 2012). STEM curricula have the possibility to help these students reach higher education goals and they have the potential to lift students out of poverty. STEM curricula offer students the chance to be able to compete globally. If Indianapolis could implement STEM curricula on a wide scale basis throughout city schools, they could become a model for the nation in education reform. Indianapolis students would be able to perform in a global economy, and they would alter the legacy of Indianapolis Public Schools.

Undertaking this task is no small feat. Indianapolis Public Schools are in need of a number of reforms. If Indianapolis were to commence implementing STEM education throughout the district they would need help and backing from the community. Universities, businesses and government support would all be required to see any positive change take place within the community. No matter what steps Indianapolis Public Schools take to become competitive, they need community support to implement changes.

One institution beginning to address the educational issues and lack of STEM curriculum in Indianapolis is Shepherd Community Center. In 2000 Shepherd Community Center started a school with 12 three-and four-year-olds because they saw an unmet need within the area of Indianapolis they were serving. There was a significant lack of early childhood educational opportunities. Today, Shepherd's school serves over 150 students in preschool through fourth grade. While their students are not yet in high school, Shepherd recognizes the importance of starting academic initiatives at an early age, especially with students that come from at-risk situations.

The school at Shepherd was formed because the community center staff saw the negative effects of the public schools in their area. At the time, only 33 percent of students who entered high school in the area of Indianapolis where Shepherd is located graduated. Shepherd's students struggle with many of the challenges that come from being in an urban setting. There is a higher rate of poverty among the students they serve - 38.6 percent compared to 20.8 percent in the rest of Marion County. Seventy-seven percent of students in Shepherd's school are minority students. Shepherd is committed to helping their students succeed so they may have a better future (Interview with Shepherd Program Director Eric Weidman, 2013).

Shepherd has chosen to use A Beka curriculum within their school. This curriculum has a strong emphasis on phonics to help ensure that their students learn to read and build a solid foundation for a successful academic career. The idea is that as students build a strong literacy base and as the school continues to expand, more technology can be introduced into the curriculum, and a higher focus will be placed on STEM education. Program Director Eric Weidman had this to say about STEM: "Currently, we are in the process of learning more about the STEM curriculum and how to properly integrate that into our programs. Our grants manager and our director of strategic initiatives have been attending workshops and seminars about how best this is integrated. We understand the demands of our world to keep up with technology, science, and math, and we want to help to better prepare them (students) for success as best we can" (Interview with Shepherd Program Director Eric Weidman, 2013).

Shepherd's educational approaches have proven their success. Over 90 percent of students who attended Shepherd for elementary school go on to graduate from high school and attend college, join the military, or receive professional job training. As Shepherd works hard to change the future for so many of Indianapolis's children, they will continue to seek out ways to provide them with the best opportunities. The school at Shepherd has made it clear that integrating STEM curriculum into their programs will be an integral part of their continued achievements (Interview with Shepherd Program Director Eric Weidman, 2013). Shepherd's model of success should be looked at to help improve Indianapolis Public Schools. Implementing STEM curriculum is a crucial step to creating students who are better prepared for the modern economy and job market. Most importantly, Shepherd's accomplishments can be attributed to the community involvement in their programs. As Indianapolis Public Schools continue to debate the best course of action for improvement, STEM curriculum should be a priority. However, no

reforms should take place without community involvement. This is the only way for any reforms to become successful. Indianapolis has a long way to go to improve public education. Shepherd Community Center can be looked at as a model for student success and an example for how to overcome educational challenges in an urban environment.

References

About Indianapolis public schools. (2013). Retrieved April 21, 2013, from
http://www.Indianapolis Public Schools.k12.in.us/about-Indianapolis Public Schools/

Biddle, R. (2012, July 10). The High Cost of Low Expectations: Indianapolis Waives Its Kids
into Despair. *Dropout Nation*. Retrieved April 16, 2013, from
http://dropoutnation.net/2012/07/10/the-high-cost-of-low-expectations-indianapolis-
waives-its-kids-into-despair/

Bonilla-Santiago, G. (2011, December 19). STEM and Urban Schools: Opportunities to Escape
Poverty's Cycle. *US News*. Retrieved April 21, 2013, from
http://www.usnews.com/news/blogs/stem-education/2011/12/19/stem-and-urban-schools-
opportunities-to-escape-povertys-cycle-

Borman, K., Hanson, M., Lee, R., &Tyson, W., (2007). Science, Technology, Engineering, and
Mathematics (STEM) Pathways: High School Science and Math Coursework and
Postsecondary Degree Attainment. *Journal of Education for Students Placed at Risk
(JESPAR)*, *12 (3)*.

Digital Transformation: A Framework for ICT Literacy. (2012). *A Report of the International
ICT Literacy Panel.* Retrieved April 18, 2013, from
http://www.ets.org/Media/Tests/InformationandCommunicationTechnologyLiteracy/ictre
port.pdf

Education Budget Project: Indianapolis Public Schools. (2012). *New America Foundation*.
Retrieved April 21, 2013, from http://febp.newamerica.net/k12/IN/1804770

Education Olympics: How Does America Rank Compared To Other Countries? . (2012, October
1). . Retrieved April 20, 2013, from
http://www.huffingtonpost.com/2012/07/27/education-olympics-how-don1707968.html

Elliot, S. (2012, July 1). Waivers allow graduation for nearly 27 percent in Indianapolis public
school who failed state tests: Number of graduates who haven't passed required exams in
algebra and English continues to grow. *Indianapolis Star.* Retrieved April 16, 2013, from
http://archive.indystar.com/article/20120630/NEWS04/207010353/Waivers-allow-
graduation-nearly-27-IPS-who-failed-state-tests

Hanushek, E. A., Peterson, P. E., & Woessmann, L. (2012, July 3). Achievement Growth:
International and U.S. State Trends in Student Performance. *Harvard's Program on
Education Policy and Governance & Education Next Taubman Center for State and
Local Government*, *12*.

Hanushek, E. A., Woessmann, L., & Peterson, P. E. (2012, January 1). Is the U.S. catching up?
International and state trends in student achievement. *Education Next*, *12* (4).
http://educationnext.org/is-the-us-catching-up/

Hanushek, E. A., & Woessmann, L. (2011). The economics of international differences in educational achievement. *In Handbook of the Economics of Education.* (89-200). Amsterdam: North Holland.

Interview with Shepherd Community Center Program Director Eric Weidman. April 28, 2013

Klein, J., Rice, C., & Levy, J. (2012, March 1). U.S. Education Reform and National Security: Task Force Report. *Council on Foreign Relations Press*, *68*, 1-120.

Moxley, E. (2012, July 2). Why Waivers May Be Inflating Graduation Rates In Indianapolis Public Schools. *NPR.* Retrieved April 21, 2013, from http://stateimpact.npr.org/indiana/2012/07/02/why-waivers-may-be-inflating-graduation-rates-in-indianapolis-public-schools/

Neil, S. (2011). U.S. Education versus the World. *Think on that.com*. Retrieved on 4/14/2013 from http://www.thinkonthat.com/archives/3754

OECD. (2012). *PISA 2009 Technical Report*, PISA, OECD Publishing. Retrieved on 4/13/2013 from http://www.oecd-ilibrary.org/education/pisa-2009-technical-report_9789264167872-en

Partnership for 21st Century Skills. (2012). *Overview*. Retrieved April 18, 2013, from http://www.p21.org/overview/p21-faq

Peterson, P. (2010, November 10). Percentage of U.S. Students Achieving at Advanced Levels in Math Trails Most Industrialized Nations. . Retrieved April 13, 2013, from http://www.hks.harvard.edu/news-events/news/press-releases/pr-peterson-education-nov10

Preparing 21st Century Students for a Global Society: An Educator's Guide to the "Four Cs". (2012). *National Education Association.* Retrieved April 18, 2013, from http://www.nea.org/assets/docs/A-Guide-to-Four-Cs.pdf

Profile for Indianapolis Public Schools (School District). (2012). *Data Provided by: Indiana Youth Institute.* Retrieved April 16, 2013, from http://datacenter.kidscount.org/data/bystate/stateprofile.aspx?state=IN&loc=2528

Promoting Power Faq's. (2013). *Alliance for Excellent Education*. Retrieved April 16, 2013, from http://www.all4ed.org/PromotingPower_FAQ

Ripley, A. (2010, October 27). Your Child Left Behind. Retrieved April 13, 2013, from http://www.theatlantic.com/magazine/archive/2010/12/your-child-left-behind/308310/

STEM-Focused Schools: Designed to Support Higher Levels of Math and Science Achievement. (2012). *The Opportunity Equation.* http://opportunityequation.org/school-and-system-design/stem-focused-schools-designed-support

U.S. Department of Education, National Center for Education Statistics. (2012). Retrieved April 16, 2013, from http://nces.ed.gov/fastfacts/display.asp?id=66

What Is the International Baccalaureate? (2013). *Collegedata.com.* Retrieved April 16, 2013, from

> http://www.collegedata.com/cs/content/content_getinarticle_tmpl.jhtml?articleId=10027

Wilkens, H. (2011). Textbook approval systems and the Program for International Assessment (PISA) results: A preliminary analysis. *IARTEM e-Journal*, *4*, 63-74. Retrieved on 4/13/2013 from

> http://biriwa.com/iartem/ejournal/volume4.2/papers/Paper4_Wilkens_ApprovalSystemsandPISA_Final_Vol4No2.pdf