

STEM Issues Project Planning Sheet

Internship or Work Setting

- Catonsville High School, Catonsville, MD
- Classes- (Standard & Inclusion) Algebra 1 & Honors Algebra 2

Selected Topic

- **Background-** Education is a constant issue especially with changes in political power since federal bills must pass through the house of representatives and the senate. Public education is always working through the system of federal funding because that is the only way public schools can remain open and provide free education to their students. These federally funded bills can make or break the future education for young adults. Teachers are working their hardest to help educate students for a future filled with more mathematics and technology than ever before. This goal, however, without policies and funding to support their hard work will make teachers unable to provide the high quality education their students need to be successful in the future. The workforce of STEM-related careers is suffering due to poor education in these subjects and has created a deficit of workers to fill these high-paying positions (Peterman et al, 2016). There is hope though as many workers in STEM-related careers cite that their most influential person in their careers were high school teachers and college professors (Huelskamp, 2015).

- **Issue:** Policy and Funding of STEM Education, specifically the amount of money being invested in STEM programs as well as the policies that support more diversity in the STEM workforce from minorities as well as promoting STEM-related fields to students when they are younger and have not shaped negative opinions on Science and mathematics yet (Peterman et al, 2016).
- **What are the national, state, local trends?** National trends currently show that there is STEM educational reform occurring (Bell, 2016). The National Council of Teachers of Mathematics has been giving out grants to teachers and school in support of STEM education research and programs (National Council of Teachers of Mathematics Grants, 2017). In the state of Maryland, education has always been a larger priority and the use of programs like Project Lead the Way, STEM education is improving. Additionally, there is a large push for more highly-qualified STEM educators to meet the need for more highly-qualified STEM workforce employees (Bell, 2016). On the local level, I am noticing a lack of funds and support at my school for the science and math departments, but engineering and technology programs are growing at our school. This lack of local funds is mostly likely due to stakeholders (parents and administrators) not noticing the need for better resources for their children and students (Johnson, 2012).

Selected Project

- **Describe how this issue manifests a need for your class or school.** This issue is a need for my classes and at my school because I teach mathematics classes

and many of my students are taking Project Lead The Way: Engineering(PLTW) and a loss in funding would take away great programs like PLTW which inspire and draw curiosity from young minds. A loss in funding would also mean less mathematics teachers as well, which means young teachers with the energy to find new engaging and exciting ways to teach curriculums could be pushed out due to lack of experience.

- **Identify any prior solutions.** Attempts have been made over the past decade, but no positive results have been recorded yet, due to an absence of infrastructure and involvement of stakeholders (Johnson, 2012). Most of the success in supporting STEM education has come from summer programs and classes that encourage student learning through fun activities and real world applications of math and science. One example is Building To Teach, a program that trains teachers to teach mathematics as a hands-on activity for students where they are building things and using mathematics in order to construct things the way they need to be for accuracy and success.
- **Provide an overview of your solution.** My solution would include refunding and programs in areas where STEM education is not being given enough funding. This could be accomplished by creating a matrix that lists grants and funds that can be allocated towards STEM education in the community in order to create programs that support students who are struggling in mathematics before they reach high school. An example of the planned matrix can be seen below that could be filled in on a community, county, or even state level that would easily organize grants that

support STEM education that way interested individuals like myself can easily see where they can find support to start or fund programs that promote STEM education.

Name of Grant	Amount of Grant	Frequency of grant	Accept or request matching funds?	Due date for application
Equity in Mathematics Grant NCTM	Up to \$8,000	yearly	No.	November 3rd, 2017

- **Who are the stakeholders for this project? Why are they stakeholders? How will you get “buy-in” from all?** The stakeholders for this project are school administrators, teachers, students, parents, and any company that employs STEM workers. They are stakeholders because a stronger STEM education will directly affect their future. I will get “buy-in” from these stakeholders by showing them the importance of a strong STEM education program and how the future of jobs and the economy is dependent on STEM career fields being filled with bright, young minds.
- **What is your timeline for implementation?** My timeline for the implementation of this project would likely be 2-4 years. This would provide me enough time to find the appropriate grants and funds and discuss this plan with fellow educators and stakeholders to get a STEM education program in place for students to be successful.

Assessing Impact and Sharing Results

- How might you assess the impact of your project? I would assess the impact of my project by looking at the number of new STEM education programs that use grants and scholarships to fund them as well as the number of visits to the matrix that I created.
- What kind of instrument might be used for assessment? I would assess the project by starting a website or a blog that shows the matrix idea for STEM education grants and look to see how others implement the idea into their own programs and ask for their feedback and comments on ways to improve the matrix by making in more detailed and adding more grants whenever they become available.
- How might you analyze the data and share the results? I would analyze the data by using passing rates for students in 9th grade Algebra 1 and see if there is an upward trend in these courses as well as an increase in students passing rate in standard level classes for Geometry and Algebra 2. I would also look at the class averages for these classes because they are courses that all students need to pass and I would look to see if more students are passing these classes with higher averages and better understanding as well as pursuing more STEM-related career fields.

Bibliography

- Bell, D. b. (2016). The reality of STEM education, design and technology teachers' perceptions: a phenomenographic study. *International Journal Of Technology & Design Education*, 26(1), 61-79. doi:10.1007/s10798-015-9300-9
- Huelskamp, D. (2015). A Sampling of STEM Professionals and Who They Name as Most Influential in their Career Choice. *National Teacher Education Journal*, 8(1), 41.
- Johnson, C. C. (2012). Implementation of STEM Education Policy: Challenges, Progress, and Lessons Learned. *School Science & Mathematics*, 112(1), 45-55.
- National Council of Teachers of Mathematics Grants. (2017). Retrieved March 05, 2017, from <http://www.nctm.org/Grants/>
- Peterman, K., Kermish-Allen, R., Knezek, G., Christensen, R., & Tyler-Wood, T. (2016). Measuring Student Career Interest within the Context of Technology-Enhanced STEM Projects: A Cross-Project Comparison Study Based on the Career Interest Questionnaire. *Journal Of Science Education & Technology*, 25(6), 833. doi:10.1007/s10956-016-9617-5