

Attack Path Research

Our Problem Statement:

~~In 2020-23, ____% of students ages 8-10 living in the Midwest have a lack of access to STEAM learning opportunities.~~

According to a 2019 study by ACT, only 20% of graduates in the United States showed readiness for STEAM work even though jobs in the STEAM fields are expected to grow by 1.1 million by 2032.

For each resource, provide the name and a link to the resource, a summary of the resource, and an analysis of why that resource is relevant to our work.

- Resource: *Give as much information as possible. A full citation would be best.*
- Summary: *Summarize in your own words. Highlight the key pieces, including features and benefits.*
- Analysis: *How does the artifact provide validity, conflict, or the need for further research? What unique aspect does the artifact add to your overall research? How does the artifact support the problem statement?*

Attack Path 1: Societal - How does this problem impact our society?

Resource:

<https://www.miracle-recreation.com/blog/how-schools-can-encourage-steam-education/>

Summary: The latest American College Testing (ACT) reports showed that 43% of students that tested were actually interested in STEM fields, but actually only 20% of the graduates displayed the readiness for the work. There were 10 steps on how school can promote STEM learning and I'm going to mention the 4th step project based learning, consider a small class garden where the learn to be self-sufficient, a short film used to raise the awareness of a topic of or a house that's made of popsicle sticks.

Analysis: This cycles back to the fact that this is a problem for society, proving that 43% of students that took interest in STEM fields only 20% of the graduates were ready for the work.

Also it's said on the page to start a STEM based class and do a project and that is one of the things that is lacking in the midwest.

Resource:

[:https://www.nms.org/Resources/Newsroom/Blog/2023/August/Unlocking-Benefits-of-STEM-Education-for-Students.aspx#:~:text=Disparities%20and%20Barriers%20to%20STEM%20Education%20%26%20Workforce&text=These%20barriers%20create%20a%20STEM,gap%20will%20negatively%20impact%20growth.](https://www.nms.org/Resources/Newsroom/Blog/2023/August/Unlocking-Benefits-of-STEM-Education-for-Students.aspx#:~:text=Disparities%20and%20Barriers%20to%20STEM%20Education%20%26%20Workforce&text=These%20barriers%20create%20a%20STEM,gap%20will%20negatively%20impact%20growth.)

Summary: many students, especially kids from underrepresented groups, lack high quality access to stem education, due to limited resources, these barriers create a gap for kids that takes away opportunities for future high paying jobs and creates an imbalance in the labor market, a way to increase stem access is to do more hands on projects,

Analysis: this supports our statement of it being a problem in society because students that live in rural or low income areas might not or don't have access to STEM due to minimal resources, theres also an imbalance in STEM jobs since not all kids have access to STEM there's not enough people learning about it so not as many jobs are being filled in those positions

Resource:

<https://www.bls.gov/emp/tables/stem-employment.htm>

Summary: There is a growing need for jobs in STEAM. We can see this from the numbers on the website which project total STEAM occupations to increase by 1.1 mil from 2022 to 2032. This is a 10% increase as a whole which is a major number for employment. The pay rate for someone who works in STEAM is over double rather than someone in a non-STEAM occupation. (\$97,980 compared to \$44,670)

Analysis: As these jobs increase in employment and demand we will need to fill in these important positions to ensure a future of improvement, especially for young STEAM enthusiasts.

Attack Path 2: Economic - How does this problem impact the economy?

Resource: [STEM Education Budget](#)

Summary: Most STEAM education programs across federal agencies received steady funding or moderate increases from Congress for the year 2022, and this year the government seeks to diversify the STEAM workforce. And increase its funding for future projects. Some government agencies like the department of education spend collectively over 6.2 billion dollars. This particular article includes other examples of funding from agencies like NASA, the department of defence and the national science foundation but the department of education by far supports the most financial backing for STEAM increasing the opportunities for jobs in this particular field of STEAM design increasing the economic opportunity for jobs designing the kits, advertising the kits, and selling the kits online or in stores and if STEAM was not funded a myriad of high-paying job opportunities would be lost and our future generations may not the opportunity to explore further options that STEAM can offer limiting their prospects for their future careers.

Analysis: after studying the article you tend to notice that even with the copious funding from a multitude of government agencies the impact of STEAM learning programs seem lacking and the impact of the programs to children an upper kindergarten level of education seem to have little exposure to the steam learning opportunities.

Resource:

https://www.jec.senate.gov/public/_cache/files/2061de0c-be23-4cf1-ad0b-270d3f6c661e/steam-top-10-12.4-final-1-pager.pdf

Summary:

The article lists reasons as to why steam jobs have become important for the economy

From 1980, steam jobs have been progressively more relevant.

On average, a person working a stem field will earn 14,000\$ more than non-stem fields on all levels of education, along with having less wage diversity based on gender and race with women earning

STEAM jobs are also becoming more essential to supporting the economy.

There is estimated to be around 2.5 million more steam workers in 2026 when compared to 2018

Analysis:

The article shows how steam jobs enhance the economy and will enhance the economy in the future. Between the pay and that steam jobs have been on the rise since 1980 it shows how the economy is becoming reliant on STEAM jobs as time goes on. If we don't nurture the steam fields our economy will hurt as a result.

Resource:

<https://www.reuters.com/world/us/us-job-openings-july-post-third-straight-monthly-drop-2023-08-29/>

Summary: the job market for steam based jobs are declining from 338,000 to 8.887 million people in july of 2023. And the quits drop form 253,000 to 3.549 million people. The job openings for steam jobs have declined from 62,000 to 27,000

Analysis:

Resource:

<https://cepr.org/voxeu/columns/impact-mechanisation-wages-and-employment-evidence-diffusion-steam-power#:~:text=Rather%20than%20cutting%20jobs%20and,to%205%25%20higher%20on%20average.>

Summary: STEAM based employers hire up to 94% more employees. And also pay jobs that are 5% higher then average.

Analysis: STEAM jobs have a significantly higher employment rate along with a better pay rate. This information supports our problem because our problem is that kids do not have as much opportunity for STEAM classes. The kids missing out on the 5% higher then pay salary along with the signifigantly higher employment rate.

Resource:

<https://www.horizoneducational.com/the-problem-with-steam-education/t1465?currency=usd>

Summary: Lack of access to steam kits hinders kids ability to have economic growth.

Analysis:

The lack of access to STEAM kits affects a lot of kids in potential economic mobility and allows kids to not reach their full potential. The ability to be able to reach your full potential relies on the

opportunity you're presented with. I feel like this is supported by our problem statement because kids don't have good access to STEAM kits.

Attack Path 3: Environmental - How does this problem impact the environment?

Resource:

<https://www.neefusa.org/story/environmental-education/celebrate-national-stemsteam-day-environmental-education>

Summary: How the environment affects STEAM and making it better. It also shows how college is affected by this.

Analysis: This article helps us figure out everything about STEAM and how it affects the environment. It helps us know what the education environment is like and what goes on around it. This makes everyone want to do STEAM because it has a good environment and it has different types of STEAM. This supports our problem statement by affecting the children and also affecting our environment to not make more inventors.

Resource:

<https://www.teachercast.net/stem-education-can-transform-environment-tomorrow/>

Summary: not only does STEAM education raise awareness to environmental issues, but it also shows them multiple ways to deal with such problems. This is possible because it teaches you how to conserve, protect, and ultimately restore the areas we live in. STEAM has the ability to help solve some of the world's biggest problems, like climate change, acid rain, global warming, etc. Regularly integrating STEAM education into lesson plans, and community events would allow people to get together and help fix such problems.

Analysis: the article shows how much of an impact STEAM has on our environment, especially the knowledge it can give kids to further the improvement to our environment. This shows us that if the kids were getting the STEAM education it would have huge impacts on the youth.

Resource:

<https://www.scmp.com/yp/discover/lifestyle/features/article/3056520/how-steam-education-can-inspire-students-act-climate?onboard=true&firstTimeRegister=true>

Summary= Different subjects in school related to STEAM learning can influence people to think differently in the ways they can contribute to helping the environment. Thinking in terms of narrative can help provide perspective in the way to think about the environment. This perspective can assist in creating new solutions to solve problems that we face with the environment.

Analysis: This article shows how thinking differently about a problem can help solve

Attack Path 4: Future Opportunities - How does this problem impact the future opportunities of students?

Students: Jacob, Keagan, Rilee, Adam Clinton,

Resource: Jacob

<https://smartstems.org/2023/01/23/looking-ahead-what-the-future-holds-for-stem-careers-in/>

Summary: Going through STEM can get you many future career opportunities. From engineering to computer science. STEM can give people great careers and they will be able to provide for themselves and their family. In 2023 jobs through STEM will be the most sought after profession.

Analysis: If children do not get access to STEM when they are younger they might not ever get invested in STEM and the fields of jobs that are available with STEM. If our problem statement is solved then kids will be able to get opportunities through STEM.

Resource: [resource](#)

Summary: Only a certain percentage of fourth, eighth, and twelfth grade students were “proficient” in science and mathematics. Fourth & Eighth: 41%; Twelfth: 21% proficiency in math, Fourth: 38%, Eighth: 34%, Twelfth: 22% proficiency in science. This proficiency relates to how successful they will be in future jobs relating to these subjects. With this lower proficiency comes less interest in STEAM-related jobs and opportunities, which the world couldn’t use

enough of right now. With less STEAM-related jobs, comes less advancement opportunities, which pushes us lower on the leaderboard with other countries.

Analysis: Since proficiency is significantly low, so are the opportunities for STEM jobs. Without STEM jobs and the advancement they bring towards technology, medicine, science, etc, we get pushed behind other countries in advancements, which in turn makes the U.S. have to compete more. B

Resource:

<https://steambuilders.eu> › steam-careers-why-is-engaging...

Summary= Helps students get invested in STEAM and help them learn more about engineering while still being young and in middle school.

Analysis: Bringing STEAM and engineering opportunities to kids younger leads to them having more education about engineering and how it will help them develop how they wanna go about it in highschool.

Resource: page 2 of

<https://news.microsoft.com/download/archived/presskits/citizenship/docs/STEMPerceptionsReport.pdf>

Summary: In the United States most parents of K–12 students 93% of those parents believe that STEAM education should be a major priority in the U.S. only 50% of parents agree that it actually is a top priority for this country. Parents who feel that STEAM should be a priority feel this way because they want to ensure the U.S. remains on top in the global marketplace and 53% of students produce the next generation of innovators 51% fewer say it's to enable students to have well paying 36% or fulfilling jobs and 30% Even though many parents 90% would like to see their children pursue a STEAM career, only 64% are extremely willing to spend extra money helping their children be successful in their math and science classes.

Analysis: In a lot of schools across the United States STEAM is not present and STEAM is shown to be helpful for 90% of students