



Building the STEM Talent Pipeline in West Virginia

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The First2 Network is a partnership of undergraduate STEM students, higher education faculty, K-12 teachers, state policy experts, and industry leaders working to realize the goals published in the recently released West Virginia Science and Technology Report; **to build a next generation WV economy** by improving student success and workforce development in Science, Technology, Engineering and Math career pathways.

Although STEM jobs are good jobs, and WV high school students are interested in STEM careers, *we will lose up to 70% of our first-generation and other under-represented STEM students during their first two years of college (At WVU alone, first-generation students make up 30% of the STEM student body).*

First2 Network knows why.

Higher education math and science courses are obstacles for first-year STEM students.

What is the problem?

The higher level that you start in math in college, the more likely you are to graduate, and graduate in STEM.

- 70% of students who place into Calculus 1 graduate with a STEM degrees versus 30% who begin in Algebra.
- ONLY 26% of **first-gen** students place into Calculus 1 as their first course.

Why is this happening?

- Lack of access to quality STEM courses in rural and poor high schools.
 - High school teachers are unaware of the different math entry requirements and required courses and how important it is to STEM student success to be calculus-ready as an incoming freshman.
 - Rural and poor school districts with many uncertified math teachers and/or empty math positions need extra and urgent attention.
- Weed-out culture in entry-level STEM classes is particularly hard on vulnerable students who have the potential to succeed.
- College students are advised out of attempting STEM or into dropping a STEM major due to math placement.
- College is harder than students expect it will be, and first-gen, low income, and minority students are often uncomfortable asking for help and navigating systems.



Analysis of opportunities. Yellow = Rural and depressed AP credit and High School GPA which depresses college GPA. College GPA influences persistence. (First2 Network)

What First2 is doing:

- Gathering evidence from our own research.
- Improving higher ed faculty and staff engagement with students.
- Preparing students to engage decision makers in their STEM schools and departments.
- Funding students to help one another.
- Having our college students visit high schools to share their experiences.
- Supporting math "bootcamps" and co-requisite courses.



First2 student at Chemours

College is expensive.

What is the problem?

Fit, Finances, and Academics are the top three reasons for dropping out, according to WVU First-Gen Office findings. Many of our students drop out of college because of financial hardship. They may struggle with homelessness, food insecurity, transportation issues, and high levels of ongoing financial stress.

Why is this happening?

- First-generation and other under-represented students often need to work to pay for school, leaving less time to learn how to college, to get to know their professors, to seek help when encountering difficulties.
- It takes longer to finish college if you are under-prepared for STEM courses; for example, if you have to take extra math classes you are behind in your course of study. It takes longer to graduate and is more expensive.
- Scholarship problems:
 - Promise is based on test scores; low income and first-generation students do worse on tests.
 - You can't opt into scholarships like Promise easily once in college, even if your work proves you should qualify.
 - It's easy to lose scholarships if you struggle with grades your first year, and often there is no re-entry path to qualify for scholarships once you "learn to college" and improve your grades.



First2 students at Marshall



In 2021-2022, First2 will give \$465,000 directly to 70 First2 students across 9 institutions to support success and to help us identify and address these problems. This approach is working.

What First2 is doing:

- Engaging students in **paid** work that enhances their skills as STEM majors, such as research internships, leadership opportunities.
- Engaging students in outreach to high school students.
- Supporting efforts to make a STEM terminal degree attainable and affordable, such as Americorps Scholarship for Service bill SB228.

No STEM workforce pipeline to connect graduates with opportunities.

1,792,147

Population

Growth Rate 2014-19	State Growth Rank
-0.6%	50



"STEM occupations are projected to grow twice as fast as occupations overall during the next 10 years"
S&T report

What is the problem?

WV exports its STEM talent according to the WV Science and Technology Plan. At WVU alone, more than 60% of graduating WV natives leave the state upon graduation each year (Ascend WV).

Why is this happening?

- Young people believe there are no opportunities for them in WV.
- First2 Industry Advisors report challenges in building applicant pools with qualified WV applicants.

What First2 is doing:

- Creating stronger relationships between higher education and industry to better understand the traits STEM industry seek in employees.
- Partnering to build the new WV Jobs Network to connect graduates with STEM employers in WV (key partners including Generation WV, High Rocks, Coalfield Development, Bristol Connect, Appalachian Regional Commission, Benedum Foundation).
- First2 Alumni Working Group mentors undergraduate students.

Needs First2 has identified:

1. Pay attention to equity in access for all high school students, especially rural, especially in math.
2. Recognition that advising toward finishing a degree and finishing a STEM degree are distinct.
3. Ask higher ed to share best practices for streamlining a path towards a STEM degree.
4. Financial aid including work opportunities and scholarships for first-gen and under-represented STEM students should match the realities of majoring in STEM.
5. Build critical workforce pathway connections and opportunities for internships and job recruiting and placement in STEM in WV.
6. Keep working to identify and solve problems in partnership with students.



First2 Students at Green Bank.

Taking Action: How do we ensure that more in WV know these things? What can you do to share this information with your legislative peers and stakeholders statewide?



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