

Your Address Shouldn't Limit Your Opportunities: STEM for All

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Project Budget:

\$25,000

Abstract:

Low-economic status is the number-one barrier to STEM careers with a significant factor being the limited access to out-of-school opportunities that spark interest and foster identity development in STEM. In January 2021, the STEM Center partnered with Boys & Girls Club of Harrisonburg and Rockingham County (BGCHR) to identify an impactful and sustainable approach to removing this barrier in our community. By developing an innovative STEM curriculum and working with talented and dedicated JMU students, we launched an afterschool program that provides BGCHR children with weekly, year-long, and high-impact STEM experiences. After piloting this program with three of the seven BGCHR clubs over a two-year period, the JMU STEM Center is now poised and energized to expand this enriching opportunity to all seven clubs reaching 325 children each year.

Project:

A recent study showed that low economic status is the number one barrier to the successful pursuit of post-secondary studies in a STEM field and, therefore, to career in STEM. In addition to the financial barriers of college, limited access to informal (out-of-school) STEM programs is also a key factor. While school STEM classes tend to focus on grades and test scores, informal programs increase involvement in, decrease anxiety with, and energize motivation for STEM. Access to these programs is critical because piquing early interest and instilling students' confidence in STEM subjects and activities are the first steps to their pursuing post-secondary STEM education and, ultimately, careers.

The JMU Center for STEM Education and Outreach is poised to make a difference for local children by developing programming and connecting JMU students to both support and bolster their own skills. We seek funding to expand a pilot partnership between the STEM Center and Boys & Girls Club of Harrisonburg City and Rockingham County (BGCHR). With expansion, this partnership will provide 325 children in our community with frequent, long-term, and impactful STEM enrichment, over 100 JMU students with the opportunity to develop their own STEM communication skills while serving the community and up to 15 students each year with transformative leadership experiences.

Boys & Girls Club is a national nonprofit organization with over 4,300 clubs across the US that provide social and academic programming before and after school and is accessible to all children regardless of the family's ability to pay. As a reflection of this mission, over 85% of BGCHR members qualify for free or reduced lunch, an indicator of lower economic status. Therefore, the demographics and informal learning platform of the BGCHR present a unique opportunity for JMU students to help increase and diversify the population of local students who are motivated towards and will be successful in STEM.

Studies examining the relative impact of informal STEM programs on long-term interest in and potential for success in STEM among children from low-income families have identified four components to a high-impact program.

1. Frequent and multiple interactions (e.g., weekly for one month or longer)
2. A learning environment that provides time and space for learners to build trusting relationships with facilitators who are also appropriate role models.
3. An evidence-based curriculum that a) incorporates concepts and practices that cut across the disciplines of STEM, b) incorporates connections to school science and math lesson, c) connects to home and family, d) provides opportunities for children to understand and practice how disciplines are integrated in real-world STEM, and e) promotes confidence in STEM subjects.

The JMU STEM Center is in a unique position to develop a program that meets all of these criteria. The Center is dedicated to K-12 STEM outreach and has years of experience with engaging JMU students in K-12 STEM education. Our pilot partnership with BGCHR started in January of 2021. This was intended to be a temporary pivot in our programming during school closures; however, the positive outcomes reported by our students and the BGCHR director suggest we can develop this effort into a nationally recognized partnership.

In the last two years, we have made substantial progress towards this goal. Our current program incorporates all three high-impact components. We have a consistent group of trained, caring, and enthusiastic JMU students who visit one of the BGCHR clubs every Friday for 22 consecutive weeks between September and April. By working with the same children each week, they are building relationships and serving as positive role models. These students are using an innovative STEM curriculum written by the STEM Center director that incorporates each of the evidence-based practices described above in number 3. Our current resources, however, allow us to provide this enriching opportunity to only one of the seven BGCHR clubs, reaching only 15% of the children who otherwise have limited or no access to informal STEM opportunities.

With donor support we will grow the program to serve 150 children across the three Harrisonburg city clubs in year 1. We can vet the full curriculum with three different groups of children, which is ideal for evaluating and strengthening it before further expansion. In year 2, we will add the 5 Rockingham County clubs, reaching 325 children. Funding is needed to support the additional STEM Leadership Interns (SLIs). To maintain the quality of programming through expansion, it is critical that we hire three SLIs per club. We will also partner with the BGCHR director to secure external funding to sustain this effort, an area in which she has a

strong track record. This will position us to make the curriculum available for adoption by other universities throughout the country for their K-12 STEM partnerships.

Project Budget Amount: \$25,000

Personnel: \$25,000

Additional information to explain or expand on budgetary needs:

\$25,00: 21 STEM Leadership Interns (JMU students). They recruit, train, and mentor other student volunteers and lead the lesson each week to receive a \$1,200 stipend/yr.