



Towards a Culture of Grants at Two-Year Colleges

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Abstract: To achieve their important mission of preparing a skilled and competitive workforce, two-year colleges need resources and strategic partnerships. In STEM, the National Science Foundation's (NSF) Advanced Technology Education (ATE) program provides substantial support to colleges looking to keep pace with the continued evolution of technology. The Mentor-Connect (M-C) program, a regenerative mentoring system for leadership development and knowledge transfer, has helped two-year colleges without ATE experience develop high-quality grant proposals for the past 14 years. The vision of M-C extends beyond colleges being successful in receiving their first ATE grant. It aims to inspire and support two-year colleges to establish a culture of grants at their institutions, with synergistic benefits for the institutions and their communities. This article describes the M-C program, its evolution, and its impact on two-year colleges' involvement in the NSF ATE program. It also presents the experience of three two-year college participants in the M-C program who have successfully shaped a culture of grants at their institutions.

Keywords: NSF ATE, two-year colleges, Mentor-Connect, leadership development, ATE grant impact, culture of grants

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Introduction

Two-year colleges play a vital role in their communities. With a primary mission to prepare students for immediate careers or to continue their education, they also serve as regional economic engines and providers of community enrichment services. They support local businesses of all sizes by rapidly responding to employer workforce needs and frequently serve as conveners of organizations across regional economic development ecosystems to advance shared objectives [1].

As the pace of technological change accelerates, this role has become increasingly important. Ensuring that two-year colleges can continue to prepare a skilled workforce while adapting to rapidly changing industry demands is essential to regional and national economic competitiveness. Yet fulfilling this mission has become increasingly difficult as technological innovation accelerates, requiring continual investments in new equipment, curriculum, faculty expertise, and industry partnerships - all while many colleges operate with constrained resources. In this environment, building a strong culture of grant-seeking and external funding is essential to expanding institutional capacity and enabling colleges to respond quickly to emerging workforce needs.

For two-year colleges, one of the most significant challenges is securing the funding needed to continuously update academic programs, expand faculty expertise, and modernize technical infrastructure to keep pace with the rapid emergence and evolution of advanced technologies. Artificial intelligence is leading in terms of growth and investment, as well as in expectations of transformative impact on the economy and society at large. Semiconductors, energy, automation and robotics, biotechnology, cryptography, and cybersecurity are evolving and growing [2], with emerging technologies such as synthetic biology, quantum technologies, and space technologies following closely [3].



In addition, two-year colleges have had to contend with the effects of the COVID-19 pandemic, reduced state financial support, and increased public skepticism about the value of a college degree. The so-called 'demographic cliff,' consisting of a sharp decline in the number of high school graduates, is also looming, with the first drop expected in 2026 [4]. With the drop in birth rates that began during the 2007-2008 recession, it is expected that the number of high school graduates in the U.S. will decrease by about 13% between 2025, when it was at a peak, and 2041.

To overcome challenges and keep pace with the rapid technological advances and structural changes in the labor market, where entry-level jobs require more advanced skills, two-year colleges need financial resources and an orientation towards strategic partnerships. The National Science Foundation's (NSF) Advanced Technology Education (ATE) program [5], now in existence for more than 30 years, helps two-year colleges address these challenges.

The NSF ATE program supports curriculum development, laboratory equipment, faculty professional development, and more, with the overarching goal of "support the education of technicians for the high-technology fields that drive our nation's economy." Since the ATE program started in 1993, about half the nation's 1,000+ two-year colleges have benefited from an ATE grant, with some colleges receiving multiple grants and moving from project grants to center grants.

The benefits to colleges from receiving an NSF ATE award and completing the grant project are many. The first is the financial support provided for developing or improving technical education programs in partnership with industry and other institutions. This support can be substantial, depending on the type of grant, which may fund small- or large-scale projects, consortia, or centers. Students benefit from the advanced technology programs introduced, along with associated work-based learning experiences and career opportunities. Faculty can access professional development opportunities and participate in research related to technician education.

Additional benefits include enhanced reputation and credibility in the business community, the potential to attract additional funding from industry and other federal sources, and the ability to provide an educated STEM workforce with the potential to advance the regional and national economy.

Proposals to the NSF ATE program have specific requirements making them different from proposals to other federal granting organizations and even from proposals to other NSF programs. Developing an ATE proposal has also evolved throughout the years. Until 2012, applicants to the ATE program had the option to submit a preliminary proposal and receive suggestions for improvement from program officers and selected reviewers before submitting the final proposal. Once this option was no longer available, the ATE program saw a need for the creation of a mentorship program to help the many colleges without any experience with the program to prepare and submit a good-quality proposal.

Methods

The Mentor-Connect Program

Enter the Mentor-Connect (M-C) program, a special NSF ATE project that started in 2012 with the ATE-funded project titled "Mentor-Connect: Leadership Development and Outreach for ATE" (NSF DUE #1204463). The program was conceived as a regenerative mentoring system for leadership development and knowledge transfer to broaden the impact of the ATE program [6]. Its goals were and continue to be to build capacity in two-year colleges and develop leadership skills among their STEM faculty to develop competitive ATE grant proposals.

The success of the first project grant has led to the M-C program continuing to be supported through several special ATE projects (NSF DUE #1501183, #1840856, and #2227301), reaching its 14th year of serving two-year colleges across the United States in 2026. The program achieves its goals through instruction,



technical assistance, online resources, and in-person support. The Mentor-Connect program is fully integrated into the ATE community, working collaboratively with ATE Centers and Consortia [7,8], and the EvaluATE [9], ATE Central [10], and MentorLinks [11] special ATE projects.

As the program matured over the years, it continuously added new components [12] and expanded its reach in order to increase its impact. Some of these components are described below. A detailed description of the evolution of the M-C program can be found in [13].

A Mentor Fellows Internship program started in 2017 in order to grow the number and the preparation of the mentors working with college teams submitting proposals. Mentor Fellows are selected through a formal application process and shadow an experienced mentor for one year before being invited to serve as full-fledged mentors with the next cohort. Since inception, the M-C program has worked with 64 mentors. Notably, in 2026, all but two mentors have been Mentor Fellows previously; the two exceptions are mentors from before the introduction of the Mentor Fellows program. Also of note, the current Principal Investigator of M-C is a product of the M-C model, having been informally mentored through three grants before becoming a Mentor Fellow, mentor, co-PI of M-C, and ultimately the project's PI. Mentors continue to stay abreast of new developments in the ATE program by attending six webinars organized by M-C throughout the year. This ensures mentors remain current and provide accurate information and guidance to the teams they are mentoring.

The group of current and former M-C mentors are an important constituency of the M-C program. Over the years, it became apparent that many mentors were once members of mentee teams who want to give back to the program that helped them succeed in their pursuit of ATE grants. This validates the regenerative aspect of the program and shows the perfect fit of the M-C community within the larger community of dedicated, and collaborative ATE practitioners.

Starting with Cohort 7 in 2019, two additional mentoring programs were implemented in M-C, known as Second-Chance mentoring and Moving-Up mentoring. Second-Chance mentoring supports college teams whose proposals were declined the previous year to improve their proposal and submit it in the new cycle. Moving-Up mentoring provides guidance to teams who are nearing completion of their first award and want to write a subsequent proposal that, as required by the NSF ATE program, has to have a new focus. While teams in the main cohort participate in two face-to-face workshops throughout the year, the teams that are part of Second-Chance and Moving-Up mentoring only meet with their mentors virtually.

In 2023, the M-C program was funded for an initiative called PI101, which provides support to first-time PIs as they begin their journey of managing and working through their awarded ATE project. The PI 101 program [14], was proposed and funded based on feedback from new PIs who were continuing to connect with their M-C mentors even after the start of their project and asking them for guidance on how best to manage the many pieces of the project. PI101 has also expanded since its first offering, responding to a real need for guidance that extends past the proposal submission. In 2024, PI101 received the Innovative Program of the Year award from the High Impact Technology Exchange Conference (HI-TEC).

Results and Discussion

The success of the M-C program can be quickly grasped by looking at the data collected over the years. Between 2013 and 2024, M-C worked with 258 colleges, which were either new to ATE or had PIs new to ATE, composing the program's Cohorts 1-12. These colleges come from 43 states and two territories, Puerto Rico and American Samoa, as seen in the map put together by the program [15].

Out of the 258 colleges, 212 submitted a proposal following the Cohort mentoring. Of the proposals submitted, 152 were awarded, resulting in a 72% success rate. In addition to these 152 colleges that were



funded for their first ATE submission, 30 colleges were awarded as a result of Second-Chance mentoring. The 182 colleges collectively received approximately \$55 million in funding from the ATE program. The 258 colleges represent about a fifth of the approximately 1,200 two-year colleges in the United States. By 2024, an estimated 505 two-year colleges have received ATE grants, meaning that M-C has mentored about one-third of all ATE recipients [16].

However, the M-C program is aiming for and achieving more than what is captured by the data above. From the very beginning, one important goal of the program has been to inspire and support colleges to establish a culture of grants at their institutions to continue pursuing ATE and other NSF grants. That is because the M-C program has recognized that rather than going for "one and done," colleges are much better served when they apply for and obtain further grants that multiply the impact on the institution.

The Second Chance, Moving Up, and PI 101 components of M-C are all supporting the goal of integrating the college and culture of grants into the overall ATE experience. Although this is not part of a formal program, mentors who remain in contact with their mentored teams over the years continue to provide informal support. Data collected through 2024 shows that 83 colleges out of the 152 colleges that successfully worked with M-C have had subsequent funding from the ATE and other NSF programs. More impressively, the total NSF funding amount for these 83 colleges is over \$135.5 million. This is in addition to the \$55 million initially funded through original cohort mentoring.

When examining the success of colleges that pursued more than one NSF ATE grant, two important questions emerge: what motivates these colleges to continue seeking funding, and how do they sustain that success? Valuable answers to these questions have emerged from recent conversations with three very successful colleges whose starting point in a sequence of ATE grants was as M-C new to ATE mentees.

The path each of these colleges took after receiving their first ATE grant to securing subsequent awards has been distinct. For the first college, the second grant expanded the original effort through a collaboration with another college. Building on that partnership, the PI later brought together multiple institutions to form a consortium while maintaining a focus on the same area of advanced technology. At the second college, the same PI continued to build on the initial project, using successive grants to deepen and expand the original focus. In contrast, at the third college, subsequent proposals were led by different faculty PIs from a variety of disciplines. This approach broadened the college's ATE impact by extending into a wider range of advanced technology fields.

The journeys of these colleges and their thoughts on these are described in the following section. By highlighting colleges that pursued different approaches to securing subsequent ATE grants, the shared experiences offer valuable insights for colleges considering next steps in their involvement with the ATE program.

Central Oregon Community College

Developing a culture of grants can sometimes be attributed to one person's dream. In this case, it was Ken Mays. Central Oregon Community College (COCC), located in Bend, OR, was part of M-C Cohort 2 in 2014 when Mr. Mays saw a need to transform the college's automotive program to include hybrid and electric vehicles.

The proposal submitted by PI Mays and Co-PI Bruce Emerson focused on educating technicians for these advanced automotive technologies. This successful proposal was the first in a series of ATE grants awarded to COCC where Mr. Mays was PI. The second proposal expanded the work from the first project in collaboration with Rio Hondo College in Whittier, CA. In the third project, COCC formed a consortium of 15 two-year colleges throughout the United States. This project, funded in 2023, promoted a national, industry-recognized Electric Vehicle certification.



COCC is now firmly entrenched in the ATE Community. Mr. Mays submitted a fourth ATE proposal in fall 2025. If awarded, the project will create a new consortium to expand the electric vehicle technician standards to the rapidly expanding e-marine and e-aviation arenas.

As a result of the ATE grants, COCC experienced increased enrollment in its automotive technology program as students sought to be at the forefront of new technologies. The program has built a strong reputation, and Central Oregon Community College has gained national recognition in the field. Mr. Mays' impact on the automotive technician workforce was recognized when he was awarded the Educator of the Year Award by NSF's High Impact Technology Exchange Conference (HI-TEC) in 2023 [17]. The award recognizes faculty who have demonstrated broader impact on technology education on both local and national levels.

In developing their subsequent proposals, the team from Central Oregon Community College used what they learned in their M-C experience. PI Mays says that M-C helped him develop a culture of grants at the college, which includes: thinking about and planning for the next proposal even while working on an existing one; building connections with other colleges; and forming and sustaining professional relationships, which he has since put to good use.

While writing their initial proposal, PI Ken Mays and Co-PI Bruce Emerson had support from the college's grant professional and an administrator. However, at the outset of their ATE work, COCC had no established grants infrastructure, only a part-time grant writer at 25% capacity, and limited institutional experience with external funding. In this context, the PI and Co-PI took the initiative to present to the college's Board of Directors to demonstrate the value of ATE grants. Over time, as additional grants were secured, institutional support grew stronger and more sustained, even through four presidential transitions. What began as a single effort has since evolved into a robust grants culture, and the college now maintains a dedicated grants office with two full-time grant professionals supporting a range of funding opportunities.

COCC's grant activity has expanded into other areas, including an S-STEM award to PI Patrick Kennelly (Preparing Central Oregon Community College Students for Careers in Information Systems, NSF DUE #2220953).

Monroe Community College

Monroe Community College (MCC) in Rochester, NY, applied and was accepted into M-C Cohort 2 in 2014. Their proposal was in the area of geospatial technology. Two more successful proposals in the same area, with Jonathon Little as PI, followed in 2019 and 2024. For these expanded proposals, the team received guidance from the Moving Up program of M-C.

MCC had a well-established culture of grants, as evidenced by their 18 NSF grants under the Directorate for STEM Education. However, when he became part of the M-C Cohort, the ATE community was new to PI Little. According to the PI, the Mentor-Connect program was critical to the project's success.

Becoming part of M-C makes someone part of a community that provides support long after the initial collaboration. Mr. Little is still in touch with and receives advice from his first M-C mentor. At the same time, Mr. Little is confident he developed the skills necessary to develop a proposal only with support from MCC's grants professional going forward.

As PI Little indicated, at MCC the college administration is supportive of faculty submitting and working on grant projects. Faculty with grants are recognized in college publications and are congratulated by the president.

Being a faculty PI on an ATE grant is challenging. It requires dedicating many hours of work, some above the regular workday, even with the release time faculty gets throughout the project. PI Little is motivated to continue working on grants by his passion for the field and the impact the grants have had on him as a professional, for his students, and for the college.



Through the ATE award, students benefit from opportunities such as paid internships, travel to other schools to work with professors who are experts in the field, and not least the career opportunities they have after graduating from the program. The impact on the college is multifaceted - as with other colleges with ATE grants, student enrollment in the program has grown, and the college is now hiring additional adjunct faculty to teach in the program. PI Little describes each new grant as a “pulse of energy” running through the department and the college.

The advice from PI Little regarding getting involved with grants is to go for it with help from the M-C program. Even though it is a time-consuming endeavor, it is a worthwhile one, and having the help and support of Mentor-Connect greatly increases the chance of success. Moreover, you become a 'lifetime member' of Mentor-Connect and the ATE family.

Johnston Community College

Johnston Community College (JCC) in Smithfield, North Carolina, came to M-C after having an NSF ATE grant transferred to the college with a PI. The college wanted to explore pursuing further NSF ATE grants. Newly hired Director of Institutional Grants, Daphne Lewis, had worked at another community college with two failed NSF ATE applications. Upon learning about M-C, she applied to the program, and the team was accepted as part of Cohort 6 in 2018. Working through the process, the JCC team submitted a New to ATE proposal in the area of biotechnology which was awarded, thus launching a sequence of successful ATE proposals continuing to today.

In 2021, the college applied to the M-C Moving Up program and submitted a second proposal expanding on the biotechnology program. This proposal was also awarded. JCC followed with two additional successful ATE proposals submitted in 2023 and 2024, again working with M-C through the traditional cohort mentoring in 2023 and the Moving Up mentoring in 2024. These cybersecurity proposals were developed by teams that included faculty with no prior experience with ATE grants.

In 2025, a JCC team again received mentoring for faculty in the automotive technologies department. At the time this article was written, the college was waiting to hear about a fifth potential NSF ATE award since starting their mentoring relationship with the M-C program. To sustain this momentum, the college is now developing a sixth ATE proposal focused on automation.

In interviews, it became clear that JCC has developed a "Culture of Grants," so the article attempted to discover what could be adapted by other colleges. First, there is a core of passionate people who believe in and promote a culture of grants at the institution. In addition to Ms. Lewis, Brian Worley, who began as faculty and is now Associate Vice President of Business, Industry, Logistics, and Transportation, is a key member of the team. Together with faculty, they ensure that the original impetus for pursuing an NSF ATE grant continues to grow through a "snowball effect" as proposals are awarded and ATE projects are completed. In addition, the work of the various teams has taken place in an environment consistently supported by college leadership, even through changes in administration and different presidents.

Matching the requirements of the ATE solicitation, Mr. Worley has strategically researched growing industry areas in the region to determine where the college can meet the needs of a skilled technician workforce so that proposals can be submitted in those areas. The result is a wide range of disciplines covered by the proposals, spanning biotechnology and cybersecurity as well as diesel and heavy equipment and automation fields.

After noting that developing a culture of grants requires a core of passionate people to take the lead, a follow-up question was what motivates the faculty to take on the challenges associated with being a PI/Co-PI on an NSF grant. At most two-year colleges, including JCC, the proposed PI and Co-PIs (usually faculty) do not receive course release time while developing proposals; however, once a grant is awarded, they receive course release time or stipends to support project implementation.



To encourage participation, faculty have support from the Director of Institutional Grants and the Associate VP during proposal development as well as after the award is made. The project team (usually PI, Co-PI, grants professional, and administrator) continues to work together throughout the project. Ms. Lewis calls her regular participation in biweekly meetings with the grant management team her secret sauce for keeping the enthusiasm for grants going.

A third item that helped develop a culture of grants is the impact that these ATE grants have had on the college. According to Mr. Worley, the funding received from the two cybersecurity grants exceeds the previous funding for the cybersecurity program over its entire existence. Grant funding helped the college acquire lab equipment that matches industry expectations. Awareness of JCC's cybersecurity range has grown, attracting students who want to graduate with the latest knowledge and skills in the field. The resulting increase in enrollment has led to the hiring of additional full-time cybersecurity faculty.

As a result of a core group of champions, strong faculty support, and demonstrated success, a culture of grants has taken root at JCC. This is evident in the 16 proposals submitted in the 2025-2026 academic year alone to multiple federal and state agencies. Since 2018, JCC has received more than 150 grant awards (including HEERF), with total funding exceeding \$43 million.

Ms. Lewis gives credit to the M-C program. In an article published in JCC News about their second ATE cybersecurity award [18], she stated: "Mentor Connect has been instrumental in guiding our team, and we are grateful for their mentorship." Mr. Worley has also found great value in being an M-C mentee. He has found that the knowledge and skills provided through M-C participation can be adapted to other grant opportunities. Mr. Worley advised colleges without ATE proposal experience to start by applying to be part of the M-C mentoring program.

Conclusion

The Mentor-Connect program, now in its 14th year of existence, has worked with more than 20% of the 2-year colleges in the country, providing them with resources to develop competitive ATE proposals.

Although each college interviewed entered the grant world differently, receiving an initial ATE award often sparked a sustained commitment to grant activity that has continued over time. While it was not possible to interview all 83 colleges that received subsequent grants, the experiences of those interviewed were consistent. Whether M-C support occurred for a first grant, as in the case of COCC, or provided ongoing support, as seen with JCC, colleges consistently reported a strong institutional commitment to building a culture of grants. While the primary motivation for these proposals remained the development of a more skilled technician workforce, an important added outcome has been the emergence and strengthening of a sustained culture of grants. Mentor-Connect has supported these colleges through mentoring, including initial Cohort Mentoring, Moving Up, and PI101. In addition, the interviewees consistently praised the informal advice and guidance they received from mentors years later.

Importantly, these colleges share key features needed to create a culture of grants, including strong support from college administration and grant offices, faculty buy-in driven by a commitment to their disciplines and student success, and the presence of individuals willing to take the lead. This article shared the stories of three colleges that have been highly successful in continuing to apply for and receive ATE grant awards. A key goal is to provide guidance for institutions, regardless of their prior grant experience, in using their ATE funding not as a one-time achievement, but as a foundation for building a true and sustained culture of grants on their campuses.

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Supplemental Materials. Link to be provided on publication

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