

STEM Teacher Leaders Will Save the Day

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Throughout US history, leaders in education have overcome numerous challenges for the betterment of *all* children. In fact, educators, community leaders, and activists continue to fight tirelessly for children from all backgrounds and abilities to gain access to a holistic education, one that cultivates their interests in life, strengthens their positions as members of society, and perhaps unlocks their socioeconomic mobility. In the last 150 years, educators have persevered through countless reform efforts, political and economic pressures, and intensifying standardized testing. However, it seems that in the past five years, education has become increasingly controversial, with decreasing public and political faith in educators as leaders. Teachers have been told what books their students can read in school, and professors have had research declared ‘taboo’ or unfundable because of connections to ‘hot-button’ political topics related to inclusive teaching. It is a downright disheartening time to be in education. We firmly believe that all teachers (and professors) went into the field of education to make a difference in the world, to support the development of young minds, and to promote a more equitable future that is better for all. Today, this mission is under attack. There are restrictions on what educators can teach, some fearing losing their jobs over once highly regarded subject matter. And budget cuts, so many budget cuts! For instance, the current Presidential Administration has gutted federal science research funding and signed an executive order to begin the process of dismantling the Department of Education. So, what next? How can responsible educators find a way forward? How can teacher educators support our teachers and students?

Enter Teacher Leadership

Teacher leadership is not new. Teachers have been leading from the classroom for a long time, sometimes through programs that empower them with training and funds, and sometimes just because they are natural-born leaders eager to enact change. As described by Lave and Wegner (1991), personal identity development happens over time through interactions with others, a place, and through communities of practice. To become a teacher leader, teachers need to feel part of a community of leaders and a member of a support system. For example, a teacher who first learns through a professional development setting may later identify as a leader in that specific area as they present professional development themselves. Working towards understanding how teacher leadership is developed to support STEM instruction is an important piece of improving STEM education (Berg et al., 2014; Joswick-O’Connor, 2020).

Teacher leadership, as one element of a broader distributed leadership model, can be fostered as teachers gain self-efficacy in teaching *and* leading and begin to identify and develop the assets they bring to a school. STEM teacher leader identity development grows from initial self-recognition as a leader and then again as others view them as STEM leaders (Chen & Mensah, 2018; Hazari et al., 2015; Holincheck & Galanti, 2023; Napolitano et al., 2023). With the help of administrators, mentors, and colleagues, teachers can be positioned as leaders by being appointed to a curriculum committee, brought in as a subject matter expert for school or districtwide decision-making, or highlighted for successes with their students or innovative teaching practices. Furthermore, teachers can be recognized as leaders when they are encouraged and supported to both participate in and lead professional learning opportunities or engage in larger action projects. Administrators can demonstrate their support of teacher leadership through funding, coverage, resources, or other institutional assets.

Our programs at Mercy University's Center for STEM Education (<https://www.mercy.edu/academics/center-stem-education>) develop teacher leaders that lead from the classroom, influencing other teachers to include more integrated STEM teaching. We have found that these teacher leaders can make big changes in their districts, when empowered by administration.

For example, one large school district we work with has nearly 10,000 students who are 78% Black, Hispanic/Latino, and Asian, and 60% from economically disadvantaged backgrounds. Through varied teacher professional development programs, some funded through grants, the teachers we have worked with have transformed the three elementary schools into amazing incubators of STEM-tastic learning. These teachers have leveraged grant-funded fellowships, professional development, and local initiatives to establish robust community gardens with associated curricula and in-house professional learning opportunities for teachers. In addition, they have set up coding and robotics clubs after school and have delivered Family Learning and Outreach for Research in Education of STEM (FLORES, <https://www.mercy.edu/academics/center-stem-education/flores>), which is a program for families of young students, and held STEM co-curricular events and initiatives connected to environmental issues like recycling, for example. Even after completing our programs, teachers pursue more grant money on their own, seeking funding and additional projects to bring in more STEM programming and experiences for students. All this work is being done by teachers in the same high-need school district. These teachers persist in the district because their jobs are rewarding, and they have relative autonomy in their teaching and co-curricular pursuits. How is this all possible? Not only do these teachers have drive and intelligence, but they have supportive administrators. And they have us, their local institution of higher education (IHE).

Supportive Administrators

First, let us talk about the supportive administrators. What does that look like? Yes, sometimes money is involved. Principals may ‘find’ a few dollars for pet projects or include these teachers in specific grant proposals. But largely, much of the support is intangible. We have witnessed the great effect the gift of time can have on teachers: Providing professional development time for the programs they are leading, arranging the teaching schedule to have common planning time, providing a substitute or coverage so the teacher can attend a conference or a special meeting. Time allocation is a wonderful way to support teacher leaders. Another way administrators have supported budding teacher leaders is by positioning them as local experts. In the example above, when the district was assembling a ‘Green Team’ aimed at increasing district sustainability efforts, the teachers who worked on the community gardens were tapped to participate instead of finding out what the committee was doing after the fact. When the district was looking into acquiring robotics or a new science curriculum, administrators knew just who to call.

Conversely, we have witnessed other districts missing opportunities. For instance, teachers who have taken on specific training or specializations, or spearheaded initiatives were completely left out of conversations and decisions related to their relevant experiences and areas of expertise. The teachers in the supportive district are treated as the professional experts they deserve to be regarded as, which seems to echo through the halls – lending credence to their projects and alerting their colleagues to their leadership status. These types of intangible support showed the rest of the school that this teacher leadership and these STEM projects were valued. The value placed on them drew more teachers to participate and get on board with STEM-focused instruction and transformed whole buildings. In a world where money for public K-12 education may be running short, truly supporting teachers as leaders is a way forward.

Supportive IHEs

Connected to the schools, in an ideal world, is the support of a local IHE. We are fortunate to have founded our own Center for STEM Education at Mercy University, which helps foster relationships with local schools and connect them with our School of Education. Any IHE can support partnerships with local districts, and many do. Leveraging connections with districts can help IHEs by providing a partner for grant proposals, fieldwork for teacher candidates, and opportunities for undergraduate service in the community. For prospective teacher leaders, this partnership can be even more meaningful. When an IHE develops a program for teacher professional learning, which might be grant-funded, it provides an opportunity for participating teachers to set themselves apart as experts or as having specialized instructional knowledge. The IHE-teacher relationship can serve the school simply through the teachers’ classrooms or, if supported and highlighted, serve the whole school and district. Having connections to the local IHE provides resources and capital for teachers (Marrero et al., 2023; Napolitano et al., 2022). But school change can happen when the administration values it and provides opportunities for teachers to leverage it. In this way, teacher

leadership can be developed within a school without additional resources. We have seen that simply regarding these teachers as accomplished professionals with specialized knowledge encourages their efforts, helps them improve their self-efficacy, and encourages them to share what they have learned with their colleagues near and far.

Our team has become experts in teacher professional learning and leadership programs. We have developed and led several grant-funded programs (NSF awards 1758317, 1339951, & 2050406; Eisenkraft, 2025; Levy, 2025; Napolitano et al., 2025) which focus on developing teachers as leaders and supporting them in learning how to take on these roles in their schools. We have developed these programs based on research on best practices for teacher professional development (Darling-Hammond & Richardson, 2009; Hillman et al., 2016; Gunning et al., 2021; Gunning et al., 2020; Gunning et al., 2016) and modes of developing self-efficacy (Bandura, 1997). These approaches have been successful in developing teacher leaders, and in making meaningful change in districts where administration is supportive (Gunning et al., 2025). We have been fortunate to garner funding that showed us a way forward to accomplish this work. By leveraging and adapting this model, we secured more funding and more teachers. At the same time, we placed teacher candidates with our teacher leaders, showing them a model to aspire to.

For an IHE, even one without significant funding, there are ways to support teacher leadership. First, becoming a local provider of professional development is a way to provide guidance and opportunities for the school and teachers. The broad adoption of NGSS-focused standards, or any new standards, is an opening to provide partnership and training to local schools. This professional development can be contracted by the district, paid for by external funding, or provided as goodwill outreach to local school communities. The best engagement is long-term, of course, where the teachers and school get to know the university professors over time and through varied activities. It is possible to organize a professional development opportunity for teachers to share and collaborate. A half-day or after-school meeting can be arranged with an opening PD talk given by a faculty member followed by a sharing session among teachers. Having snacks and coffee is a nice touch if you have funding to cover it. This is a low-stakes way to bring local teachers to campus and develop the community. Also, many schools of education have a dean's advisory group, as recommended by accreditation bodies. These groups are a way to get the administration on board to bring teachers to campus or initiate professional development partnerships. The IHE benefits by understanding the current contexts and issues facing schools today while providing partnerships with trusted teachers for field placements and partners for grant proposals (Levy et. al., 2024).

Faculty can also leverage these partnerships for opportunities to do research with teachers or students and support teacher leaders in writing practitioner articles and proposals for professional conferences or grants. They can also share teachers' work on social media channels connected to the IHE. Teachers often do not have the time to find these professional opportunities on their own or realize they are even available. When a faculty

member recommends them or offers to partner, the teacher can develop self-efficacy for these activities through verbal persuasion (Bandura, 1997). The successful realization of these pursuits provides additional clout for the teachers, further positioning themselves as local experts in the district with that expertise recognized by the field at large.

So far, we have described ways to support current teachers to become leaders, what about laying this foundation before they enter the classroom? Setting the goal in pre-service teachers' minds to be a leader later would be the best way to bulwark schools for the future (Sheppard, 2021). It can also promote teacher satisfaction and retention (Holland et al., 2014; Martin & Benedetti, 2025; Napolitano et al., 2023). How can pre-service programs support the vision of teacher leadership? The first step is, of course, to connect with and support active teacher leaders as mentors for pre-service teachers. This could be as simple as completing fieldwork in the teacher leader's classroom or inviting the teacher leader to deliver a talk or PD for pre-service teachers. If an IHE does hold a meeting for in-service teachers, inviting teacher candidates is a great way to foster the habit of professional development and the importance of collaboration with both other teachers and the IHE. IHEs can also intentionally place student teachers with these teacher leaders, which is both a mentoring and leadership opportunity for the cooperating teacher and a supportive, forward-thinking classroom where leadership skills can begin to percolate for the novice teacher.

While it can feel daunting to take on the charge of developing teacher leaders, we feel this approach is a grass-roots way to support education for long-term success. The primary expense is truly time and energy. As long as teachers and faculty are willing and the administration is supportive, partnerships and programs can flourish. As opportunities arise, this work can be supported and expanded. In addition, as partnerships are strengthened, more administrators and teachers are willing to participate. The most important thing to do is to begin. Seek out your local district, or even start with just a few willing teachers. The news of the work will spread, and over time, more educators will be interested. As teachers develop interest and instructional practices improve, even reluctant administrators will want to be involved and learn how they can support their own teacher leaders.

The authors of this editorial are willing to speak with faculty who want to learn more about supporting teacher leadership and have specific questions.

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