

Three Models to Address the Global Teacher Shortage: What School Leaders Must Do to Create Sustainable Pathways That Grow Well-Prepared and Diverse Teachers

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Abstract

A global teacher shortage has presented schools and school leaders with an unexpected barrier to success in their efforts to recover learning loss and generate meaningful academic gains after the COVID-19 pandemic. The high number of teacher vacancies requires an innovative and coordinated response from school leaders and teacher preparation programs to ensure a qualified and diverse teacher workforce now and in the future. This paper explores three models initiated by Marywood University in collaboration with its school partners to expand the teacher pipeline, recruit and retain highly qualified teachers, and address a growing need for diversity in the teaching profession. Those models include a grow-your-own (GYO) program for high school students, alternative routes to certification for aspiring paraprofessional educators, and an accelerated pathway for adult learners seeking initial or secondary teaching certifications. Together, the University and its partners have responded to the needs of the workforce and created sustainable practices to diversify and stabilize the local labor market. In combination with emerging literature on teacher preparation, these models provide a foundation for best practices that can be used to produce similar results in a variety of settings, including international contexts.

Beyond recounting successes and comparative analysis, this paper calls on school leaders to embrace their role in developing innovative, sustainable, and ethical teacher preparation programs that are capable of filling teacher vacancies in the modern era.

Keywords: *Teacher Shortage, Grow-Your-Own (GYO), Alternative Route, Accelerated Pathways, School Leadership, Teacher Preparation*

1. Introduction

Teacher quality matters. More than any other tool or resource that can affect student success, the single most important factor that influences student learning is the quality of the teacher who designs, delivers, and assesses their progress (Darling-Hammond, L., & Young, P., 2002). Ministries of education, state departments, and school leaders have focused on this vital element in the classroom for years in an effort to improve student outcomes and increase accountability (Danielson, C. 2016; The New Teacher Project, 2009), but before the quality of teaching can be assessed in a classroom, there must first be a highly qualified teacher assigned to it.

Teacher shortages have garnered attention in the five years that elapsed since the global pandemic (Miller et al., 2019; Rice et al., 2024; Pitt, 2025; Sparks, 2025). But a diminished supply of qualified teachers affected schools long before COVID-19 (McKibben, 2025; Partelow, L., 2019; Schmitt, J., & deCourcy, K., 2022). This is especially true in specific content areas such as math, science, and special education (Day, J., & Nagro, S., 2025; Rice et al., 2024). Poor working conditions and overall compensation are generally recognized barriers to a sustainable teacher pipeline (Sparks, 2025), with some further noting particular difficulty filling vacant positions in rural areas, urban schools, (Carl, B. & Seelig, J., 2025; McClure, C., & Reeves, 2004; Miller et al., 2019) and in communities with compounding socioeconomic challenges (Bianco, M. & Marin-Paris, D., 2019; Goings et al., 2018; Research for Action, 2025).

Recognizing the importance of establishing and maintaining a sustainable teacher pipeline, state agencies have supported Alternate Route Teacher Certification (ARTC), designed to increase the number of qualified and certificated teacher applicants by reducing barriers to entry into the teaching profession. Such efforts have focused on providing financial support for alternative route programs, incentivizing continuous service



for teachers certified through them, and addressing general working conditions for all teachers through leadership training and professional development (Miller et al., 2019; National Education Association, 2020; Pitt, 2024). While much is documented about the effort to recruit candidates to alternate route programs, there is considerably less attention given to best practices and the sustainability of ARTC programs in the literature. The aim of this paper is to describe themes that emerged from a comprehensive literature review on alternative route teaching certification programs in order to compare them with programs under development at Marywood University in the United States of America, and inform others who are similarly tasked with designing alternate route programs in response to a diminished supply of qualified teachers.

2. Methodology

A narrative review was used to explore and explain phenomena expressed to the authors by local school leaders from twenty public and private schools. Sources were first identified by themes expressed over a two-year period of on-site visits and professional events with K-12 school leaders. Thematic and content analyses were applied to the initial search terms. Chronologic order provided a final search strategy that was initially delimited to a five-year post-pandemic window. Older sources were then identified through spiralization.

No formal risk of bias assessment was employed, though the author's independent research served as a mitigating factor for inherent bias.

3. Research Questions

The research questions that guided this paper were:

1. How do alternative route teaching preparation programs structure themselves to serve the needs of teacher candidates, particularly those in high-need areas, to increase supply to the local teacher labor markets?
2. What can educational leaders do to ensure their alternate route programs align with established best practices and position ARTC teachers for sustained success in teaching?

4. Literature Review

Alternate pathway programs vary from state to state in the US but are generally described as programs that recruit cohorts of students to obtain a state teaching license through an accelerated pathway that reduces barriers that might dissuade future teacher candidates from teaching (Blazar et al., 2026; Day, J., & Nagro, S. 2025). The two primary models found in the literature include pre- and post-baccalaureate alternate route teacher certification programs and community-rooted "Grow Your Own" models. Pre- and post-baccalaureate programs recruit prospective teachers from adjacent fields into teaching, while Grow Your Own programs are designed for high school students and/or community members already employed or engaged in the schools without teaching credentials.

Alternate Route Teacher Certification (ARTC) programs have become a vital resource for school leaders in responding to global and localized teacher shortages (Day, J., & Nagro, S., 2025; Garcia, 2024; Miller et al., 2019; National Education Association, 2020; Research for Action, 2025; Pitt, 2024). By relieving teacher candidates of common barriers to entry into the profession and placing greater emphasis on real-world classroom training over a traditional approach to teacher preparation (Garcia, 2024; Hamman et al., 2023; National Academy of Education, 2024; National Education Association, 2020), ARTC programs reduce the delta between pre-service training and full-time employment as a teacher. In doing so, they not only increase the supply of qualified teachers they also demonstrate the potential to increase diversity and reduce teacher attrition (Hamman, D. 2023; McKibben, S. 2025) that can exacerbate teacher supply problems.

There is great evidence to suggest that alternate route programs have led to an increase in teacher certifications, particularly for areas with the greatest need (Hamman et al., 2023; PA Dept. of Ed, 2025;



Research for Action, 2025). Examining their own alternate route program outcomes, Miller et al. (2024) recounted early success not only in recruiting candidates to the teaching profession through their ARTC program but also in job placement. “Over the course of the past five years, 154 participants have started our [alternate route] program, and 113 have been hired and placed as teachers of record, which is an average of 22 new teachers each year. [...] Statewide, alternative IHE-based teacher preparation program completers made up 26%-30% of the teacher education completers from 2012 to 2016 (p. 5).” Citing data from the 2021 US Bureau of Labor Statistics, Day and Nagro (2025) similarly reported that nearly 20% of all newly certified teachers entering the workforce in the United States came from alternate route programs (p. 739).

In Pennsylvania alone, over 100 students were reported “on track” to become certified special education teachers through an Accelerated Special Education Teacher Certification program offered by 14 colleges and universities throughout the Commonwealth (Pennsylvania Department of Education, 2025). That represented nearly 15% of all new special education instructional I certificates from 2023-2024 (Pennsylvania Department of Education, n.d.).

Together, these reports indicate that higher education leaders need to design ARTC programs for an average of one out of every five certified teachers, a number that may increase due to early retirements and natural attrition.

With this in mind, the authors investigated how alternative route teacher certification programs were evolving to meet the needs of teacher candidates, particularly those in high-need areas. The research objective was to learn best practices that can be used to increase teacher supply and ensure ARTC teachers are positioned for sustained success. The themes chosen by the authors relate to the design of ARTC programs, the recruitment of teacher candidates, the delivery of instruction, and the overall sustainability of those programs.

4.1 Provide Multiple Pathways

The first theme found in the literature was the wide variety of ARTC programs themselves. “While most states permit them, AR preparation programs are difficult to define due to their vast models of requirements, implementation, and participants (Day & Nagro, 2025, p. 738).” No singular ARTC model for either pre- or post-baccalaureate programming presented a clear advantage in terms of teacher recruitment or outcomes, but all demonstrated promise in fulfilling their goals. Therefore, ARTC Programs that offer multiple pathways, including alternative route programs for adults, paraeducators, and high school students, will invariably serve a broader range of future teachers than those that limit themselves to one specific model. A multi-tiered approach to alternative certification was also shown to increase diversity among alternate route certified teachers. “Much of the research examining the different pipelines used to recruit teachers of color ultimately finds that ‘Grow Your Own’ and [emphasis added] residency programs are most successful in recruiting teachers of color (Carter, 2021, p. 2).”

The potential for diversifying teacher candidates through multiple ARTC pathways was supported by McClure and Reeves as early as 2004. Attracting “those who have the interest and potential but lack education credentials and certification [including] secondary school students, community college students, education paraprofessionals, substitute teachers, and professionals in other fields - will require states to develop career pathways that accommodate the particular needs of nontraditional students, including financial aid (p. 16).”

4.2 Meet Future Teachers Where They Are

Preparing pre-service teachers with real-world classroom experience through ARTC programs was a core component of both adult teacher training programs and Grow Your Own models. In many ARTC models, classroom experience was used to supplement, or even replace, traditional lecture-based classes. Such job-embedded training serves as a tool for affirmation, validation, and re-recruitment of ARTC teachers, while providing valuable experience, but it required changes to traditional preparation to be successful. A



number of programs moved away from in-person instruction entirely, opting for online modalities, rather than in-person classes for ARTC students.

Online instruction was also shown to remove the barrier of proximity to campuses. The need to “meet the students where they are at” or, in this case, meet the *future teachers* where they are at, was expressed to the authors and emphasized in the literature. This phrase has become commonplace in K-12 classrooms in the post-pandemic era, emphasizing the importance of understanding student readiness and designed instruction scaffolds learners toward instructional goals. Similarly, ARTC candidates must be met where and when they are able. The online modality was frequently cited as the preferred method for flexible ARTC instructional delivery. “One way to address teacher shortages in rural areas is to offer quality alternate route degree programs through an online delivery system, which can overcome the barrier of proximity to a campus or program (Miller et al., 2025, p. 2).”

Shifting to online instruction can be a significant challenge. It is presented throughout the literature as a necessary first step, however, to reducing barriers for alternative route teachers and one that has the greatest potential for sustainability.

4.3 Cultivate Partnerships

Practitioners with whom we worked frequently shared how rapidly the field of teaching had evolved in the years that followed the COVID-19 pandemic leading to teacher burnout and increased attrition. In response, most suggested the need for collaborative efforts and partnerships between schools, colleges and universities, community leaders, and policy makers. “The data is clear: If Pennsylvania hopes to be an educational and economic leader in the future, then recruiting and retaining a skilled and diverse teacher workforce must be a top priority of policymakers (Boyce & Morton, 2023, p.7).”

Local organizations such as PA Needs Teachers have initiated public relations campaigns to address what they say is a teacher shortage crisis that threatens student achievement and the prosperity of the Commonwealth of Pennsylvania. “If we want our kids to be equipped to achieve their dreams and our economy to thrive, it’s simple: PA needs teachers (PA Needs Teachers, n.d.). Similar calls for cooperation among state and local agencies were presented in Blazar et al. (2026), Hamman & Nguyen (2023), and Miller and others (2019).

The recent focus on teacher shortages is not limited to a specific region of the United States, however. It is a national problem that can be addressed through strategic partnerships between school districts, universities, and community organizations. A variety of state-wide reports suggest that coordinated responses have begun; however, more work remains. With this in mind, we frame the discussion of the literature around a case study of ARTC programs at Marywood University in Scranton, Pennsylvania, United States of America.

5. Case Study Discussion

5.1 Multiple Pathways to ARTC

One of the strongest correlations between the literature and the implementation of programs at Marywood University was the importance of offering multiple pathways into the teaching profession. Rather than focusing on a single certification model, the School of Education introduced and developed several ARTC programs. The pathways include a Grow Your Own (GYO) partnership with a local school district, an Early Childhood Education pathway through a Career and Technical Center, and a Paraeducator program with a local education agency. Modifications to the University’s existing Master of Arts in Teaching (MAT) program were also made to reflect the ARTC pathway programs and reduce barriers to entry into the profession for post-baccalaureate students. Each pathway opened the door for students who may not have considered teacher certification through a traditional process.



Conversations with prospective students revealed that beginning or returning to a traditional teacher certification program felt too rigid and often did not align with the realities of ARTC students' lives, which included full-time employment, caregiving responsibilities, financial commitments, and personal obligations. These pathways were created to provide opportunities for certification to students who previously believed none existed. Flexible online coursework, part-time enrollment programs, reduced tuition costs, and evening and weekend sessions made certification possible for them.

In addition to increasing enrollment, these pathways attracted a more diverse applicant pool, including candidates from a broader range of racial, cultural, socioeconomic, and professional backgrounds. Many students were already connected to their local school through roles such as paraprofessionals, substitute teachers, and classroom aides, which reinforced the benefit of culturally relevant teaching.

5.2 Recruiting ARTC Candidates

Another finding was the importance of relationship-based recruitment efforts and individualized student support through personalized advisement. "Recruiting for the program was not a one-time event [...]. We constantly evaluated our various recruiting strategies [and] recommend that programs designate personnel to be responsible for monitoring recruitment efforts to ascertain that programs are effectively expending their efforts and resources (Miller et al., 2019, p. 13)." Faculty and staff at Marywood made a commitment to meet potential candidates in the field rather than to rely on traditional recruitment through general marketing. That allowed the University to better understand the needs of local schools and create pathways that were more likely to benefit teacher candidates. Faculty advisors then worked closely with students to customize a schedule that took their personal responsibilities, financial resources, work commitments, and long-term professional goals into consideration. Our experience was consistent with Miller and others (2019) in a post-pandemic setting.

5.3 Meeting Them Where They Are

Meeting students "where they are" required changes in modality, course offerings, and master scheduling for the University. The evolution of the program was not always comfortable for faculty and part-time instructors, but the focus quickly shifted to making the online learning space as engaging and supportive as possible so students did not feel as though they were teaching themselves. This required a blend of synchronous and asynchronous classes, redesigning course assignments and assessments to match the modality, and an ongoing commitment to making the coursework relevant, meaningful, and engaging. The program also added course sections and offered coursework outside of normal sequences to ensure that courses were available when students needed to take them. This flexibility helped students stay motivated and served as an important re-recruitment and retention tool by preventing semesters of inactivity.

5.4 Importance of Online Modality and Field Experience

There is no doubt that many faculty still prefer in-person learning experiences for preparing future educators. However, the program recognized that traditional on-campus instruction posed a significant barrier to the ARTC pathways, as described in the literature. This was equally true for high school students who are required to attend school, paraeducators employed by schools and bound by defined operational hours, and post-baccalaureate students with full-time jobs and/or family responsibilities. As a result, the ARTC programs at Marywood adopted a blended approach to online learning and retooled course activities and assessments to better align with an online modality. The flexibility created opportunities for students to pursue certification without sacrificing employment or other responsibilities. More importantly, a shift to online learning preserved and emphasized real-world classroom experiences and job-embedded learning. Students in the Grow Your Own (GYO) program spend up to a full class period each day working with younger students and master teachers to observe and apply basic elements of lesson planning and instructional support. The paraeducator pathway recognizes that paraeducators have daily access to classrooms, students, and experienced teachers and strengthens their experience by providing additional layers of support from faculty, field supervisors, and a structured scope and sequence of applied learning opportunities that deepen understanding of curriculum and pedagogy in their school setting.



5.5 The Role of Partnerships

The redevelopment and continued growth of the SOE's ARTC programs would not have been possible without the cooperation and genuine collaborative efforts of local school districts, school leaders, and community partners. The School of Education made a concerted effort to work directly with educators in their school communities off-campus. In turn, school leaders and community partners opened their doors and worked collaboratively with the University to identify certification pathways that could address staffing shortages without significantly disrupting the school schedule and staffing. Each partner school and school leader played an essential role in creating, redefining, and sustaining the ARTC pathways. These partnerships provided valuable insight into constantly changing workforce needs, local challenges, and the types of support necessary for future teachers to be successful.

School leaders were essential personnel who identified ARTC candidates already working within their schools as substitute teachers, paraprofessionals, or support staff, and encouraged them to pursue certification through an alternative pathway aligned to their needs. As a result, the ARTC programs expanded access to the teaching profession while supporting local schools in addressing staffing shortages in the areas of greatest need, particularly rural and urban schools and more generally, special education classrooms. Efforts are now underway to recruit additional candidates for math and science certifications which remain difficult to fill.

Through the ARTC pathways, enrollment in the School of Education at Marywood increased 45% in three years. These results suggest that partnerships between universities, school districts, and community organizations are, in fact, essential for developing sustainable and responsive teacher preparation pathways capable of addressing the ongoing challenges caused by teacher shortages.

6. Limitations

There were several limitations to this literature review and case study. First, the research was limited to themes expressed to the authors of this paper in K-12 settings in the United States. It relied heavily on available literature published in the past five years (2021-2026) and used spiralization to identify earlier work that might inform best practices. A comprehensive review of the literature dating back to the origin of alternative teacher certification programs may yield different results. The same can be said for the inclusion of literature focused on international schools.

The discussion of the case study is similarly limited to one small private university in Northeastern Pennsylvania, United States, and may not be reflective of a broader sample of colleges and universities that offer ARTC programs, both domestically and abroad.

7. Implications and Conclusion

This paper presented the changing needs of ARTC programs. Those needs are most relevant to anyone working in a higher education leadership position with teacher training programs. The paper stressed the importance higher education leaders working closely with their K-12 counterparts to respond to current teacher shortages. In doing so, we must also recognize the changing needs of K-12 school leadership.

Principals, supervisors, and superintendents will need to commit to the recruitment and retention of a fully qualified and diverse staff in a way that may not have been addressed in their leadership training programs. Graduate leadership programs should be willing to offer support and training designed for new challenges in K-12 leadership.

Our conversations with K-12 school leaders led to the realization that modifications to our own graduate-level leadership training program were necessary. Closer attention to applied leadership styles that reduce teacher attrition, improve working conditions and school climate, and support a greater understanding of labor relations were prioritized over management theory.



In making those adjustments, students' confidence in their ability to resolve complex problems of practice that lead to teacher shortages increased. Interest grew in the program resulting in higher enrollments and greater diversity of leadership candidates over the past two years. The redesign also led to the creation of a new degree at the University - a Doctor of Education in Educational Leadership – that is focused on leading “in the new normal.” The Ed.D. in Educational Leadership has now expanded to an international market for teacher-leaders and school administrators around the world leading to greater learning experiences and preparation of leadership candidates.

In summary, the themes presented in the Alternate Route Teacher Certification research were able to be directly applied to school leadership: in order to prepare the next generation of highly qualified educators *and educational leaders*, we must provide multiple pathways that reduce barriers to entry, meet aspiring educators and educational leaders where they are at, and maintain collaborative relationships between K-12 schools and certification programs, in order to resolve shortages now and in the future.

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