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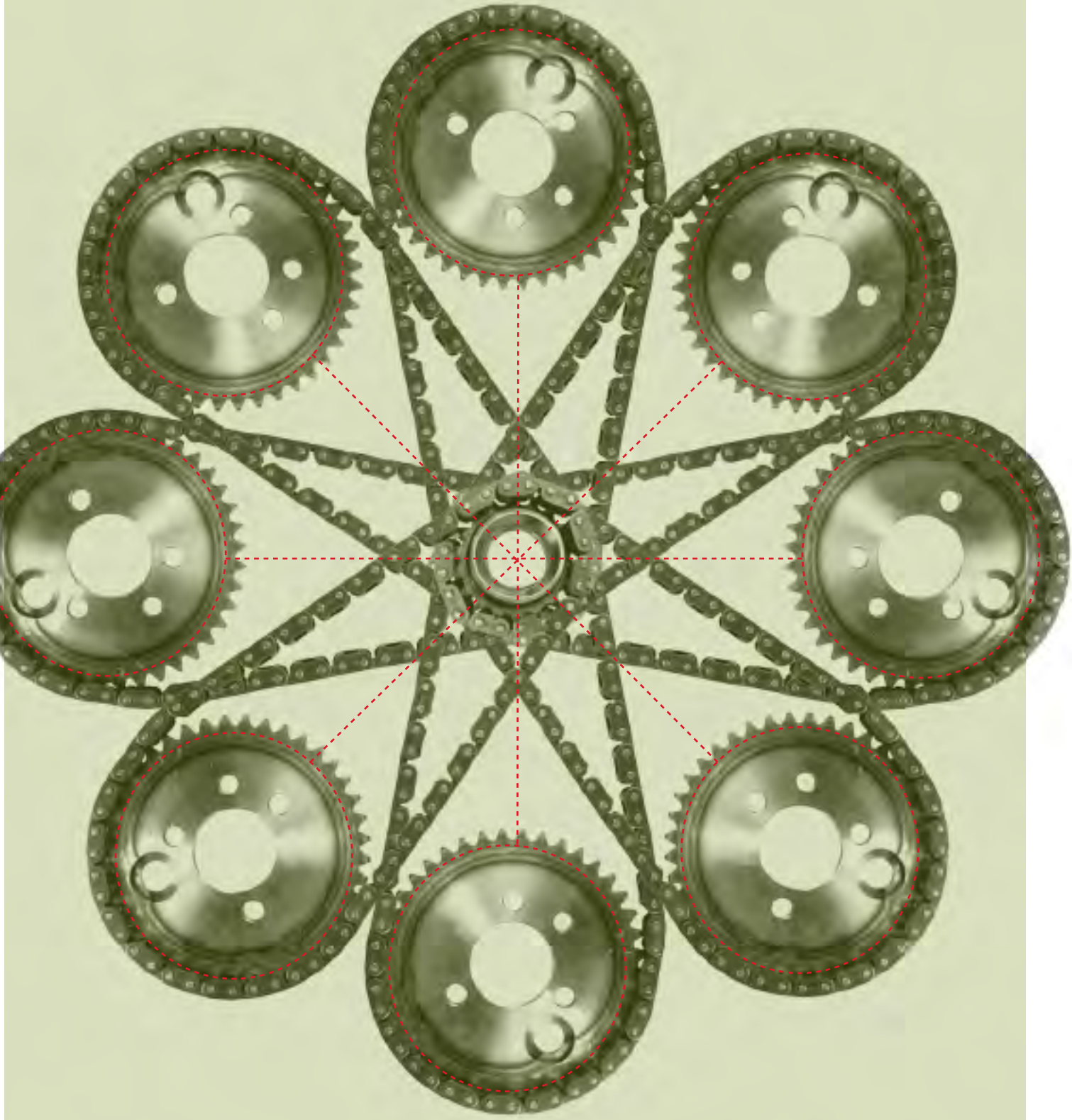

Mentoring Matters: Helping Transitioning Teachers

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"The most powerful instrument for change, and therefore the place to begin, lies at the very core of education—with teaching itself." (National Commission on Teaching & America's Future [NCTAF], 2003).

Changing of the Teaching Force

Teachers matter, and teachers of mathematics are a changing population. Because of problems with retention we are faced with an influx of novice mathematics teachers with diverse backgrounds. Many new entrants into mathematic teaching are people with backgrounds in mathematics, but little education in teaching and learning. One way to help these novices reach their potential as mathematics educators, and thereby improve the mathematics learning of their students, is to pair them with accomplished teachers who can mentor beginners in the complexities of teaching. This article will describe reasons for a changing teaching force, review the literature on mentoring, and finally offer a model of multi-layered mentoring designed to work within a school district/higher education partnership for people transitioning into education.

There is little doubt that the *No Child Left Behind Act of 2001 (NCLB)*, stresses high quality in the teaching force. One aim of NCLB is to lower the barriers that keep many talented people from becoming teachers. NCLB gives states three broad guidelines in defining highly qualified teachers. They must hold a bachelor's degree, have full state certification or licensure, and prove that they know each subject they teach. However, full state certification can be a temporary teaching certificate, which requires no courses on teaching and learning, and that temporary certificate may be valid for up to three years. This means that a person who holds a bachelor' degree and has demonstrated mastery in the content area can easily become a mathematics teacher with little or no background in education. Consequently, the mathematics teaching population is apt to continue to change quite significantly from a population who come with an educational background, as people from industry will become a viable part of the teaching corps. Although many people from industry are mature and successful professionals, they are novices when it comes to teaching.

Industry can provide a valuable pool of novice, inexperienced teachers who can become effective mathematics educators. Typically, people with the high level of mathematics mastery required for secondary certification come from professions such as engineering, where they have used mathematics as a tool in the 'real world'. They know the math; they have used mathematics in their work. Their unique knowledge and skills allow them a true-to-life perspective that can make mathematics "come alive" for students. Studies show that content knowledge of teachers has an impact on student achievement (Goldhaber & Anthony, 2003; Sanders & Rivers, 1996; Wright, Horn, & Sanders, 1997). At the same time, while people transitioning from industry into teaching most likely have content knowledge in mathematics, they often lack the pedagogical knowledge and pedagogical content knowledge associated with good teaching.

Problems with Attrition

Most new teachers, either from industry or from colleges of education are talented and have potential. Simply stated, we cannot afford to lose them. And we are losing them—

in droves. Since the early 1990s, more teachers left the field of education than entered it, and the problem is getting worse. For example, Ingersoll found (NCTAF, 2003, also see Ingersoll, 2001) in the school year 1999-2000 a staggering difference of 55,000 (or 24 percent) more teachers left the system than entered it. Compare this with 1987 -1988, when there was only a 3 percent difference. The National Commission on Teaching and America's Future (2003) estimates that almost one-third of all new teachers leave the field in the first three years and after five years we have lost up to half.

We all know having skilled teachers and keeping them is one of the best ways to improve student achievement, hence it is crucial that we make a strong effort to support mathematics teachers in those critical first years. The problem becomes how leaders can best meet the needs of novice teachers coming from industry as the teaching population shifts. Ball (2003) succinctly states that, "We cannot afford to keep re-learning that improvement of students' learning depends on skillful teaching, and that skillful teaching depends on capable teachers and what they know and can do" (p.1). We can no longer do what we have always done.

Supporting Novice Teachers

Some important questions for the educational community to consider are:

- *How can we help novice teachers from industry develop the necessary pedagogical content knowledge essential to becoming effective educators?*
- *How can we be supportive in a way that both improves retention and contributes to new teachers' professional development?*

One way to meet these challenges is to provide all novice teachers with mentors as they learn to teach, and not just at the end of teacher education programs. Mentoring is defined here as the process of supporting or coaching new teachers by more experienced individuals in order to improve and increase work-based learning. Mentoring is especially important for teachers transitioning from industry who are likely to enter the classroom with little formal training in teaching and learning. Effective mentors can provide the population of novice teachers who are transitioning from industry with models of and experiences with exemplary teaching to assist in the new teachers' development of pedagogical skills.

The word *mentor* comes from Greek mythology where *Mentor* was an old friend of Odysseus entrusted with the education of his son Telemachus. Although the notion of mentoring is quite old, mentoring has increased dramatically since the eighties as a way to support new teachers and improve retention (Huling and Resta, 2001). Most of the literature on mentoring describes the benefits for new teachers (Odell and Huling, 2000), but some describe the benefits for the mentors themselves (Holloway, 2001; Gordon and Maxey, 2000). Our focus in this article is on the benefits for *new* teachers.

According to the National Commission on Teaching and America's Future (2003) mentoring has a positive effect on teacher attrition. "With an effective mentoring program, new teachers not only stay in the profession at higher rates, they also become competent more quickly than those who must learn by trial and error." (p.123) Likewise, Eberhard, Reindhardt-Mondragon, and Stottlemyer (2000) investigated variables that influenced beginning teachers' decisions to continue teaching or leave the profession and found that effective mentors increased the likelihood of retention, especially when the mentor-protégé relationship continued into the third or fourth year of teaching.

The importance of learning from a more seasoned, knowledgeable professional is held in high regard and teachers certainly value mentoring. According to Smylie (1989), teachers rate learning from other teachers as the second most valuable source of information about effective teaching over only their own teaching experiences. He found colleagues are a more valuable learning source than university professors, administrators, consultants, or specialists.

Mentoring can be a powerful way to assist people in learning to be effective mathematics educators. But there exists great variability in mentoring programs. Smith and Ingersoll (2004) analyzed data from the nationally representative 1999-2000 Schools and Staffing Survey and identified four different levels of mentoring programs and that had different effects on one year retention—whether or not the teacher left education, or moved to a different school. The levels they identified were:

1) *No support provided*;

2) *Basic induction* which includes a mentor in supportive communication with administrators;

3) *Basic induction plus collaboration* which adds seminars for beginning teachers and collaboration with other teachers (or common planning time); and

4) *Basic induction plus collaboration plus a teacher network plus extra resource*, where teachers participate in an external teacher network, a reduced number of preparations, and a teacher's aid.

Smith and Ingersoll found that in their data 56 percent of teachers had basic induction, and 26 percent had basic induction plus collaboration, only one percent of the beginning teachers had the full package, and three percent had no support at all. As the level of support increased, the attrition rate improved. Attrition rate in this study was defined as *movers*, those who moved to a different school, and *leavers*, those who left the profession all together. The statistics illustrated that teachers who received induction basic (15 percent leavers and 21 percent movers) were only slightly different from those who received no mentoring (20 percent leavers and 21 percent movers). However for teachers who received basic induction plus collaboration the numbers decreased to 12 percent leavers and 15 percent movers. The data also show that the teachers who received the full, multi-layered mentoring had only 9 percent leave the profession and 9 percent move to a different school.

Similarly, the findings of a large-scale study at the National Center for Research on Teachers Learning (Kennedy, 1991) with a sample of 700 teachers and teacher candidates from a variety of programs including pre-service programs, in-service programs, alternative routes and induction programs, found that the availability of mentors alone does not guarantee that new teachers will become "better" teachers. The fact that mentors have seniority or are successful at teaching children does not mean they are going to be effective at teaching new teachers. Another concern of Kennedy's was that often mentors are not given the release time required to meet with new teachers effectively. Mentors need time both to observe and to conduct pre- and post-observation coaching to allow for reflection on the part of the mentors, a need not always possible to meet in an ordinary school setting. The dilemma is further compounded by a wish of many new teachers to remain isolated for fear of being found incompetent. Seasoned educators and the public have high expectations of beginning teachers, often expecting them to perform at the level of a veteran. Consequently, first-year teachers feel overwhelmed and isolated (Brock & Grady, 1998). Plainly, having a skillful mentor can be critical for new teacher retention. But the scenario of new teachers' working in isolation and lacking guidance of experienced teachers is so common that education has been called "the profession that eats its young" (Halford, 1998, p.33).

Clearly, the *quality* of the mentoring program is related to positive effects of teacher retention, and yet not all mentoring programs are of the same worth and have the same positive outcomes (Smith and Ingersoll, 2004; Kennedy, 1991). Leaders of mathematics education are in a position to support the implementation of powerful mentoring programs (Halford, 1998). Implementing a mentoring program carefully, like any other new program, is critical. The literature on educational change identifies lack of proper implementation as one reason that many reform efforts fail (Hoban, 2002). Each year school districts spend untold amounts of money to purchase a variety of mathematics programs promising to have positive impacts, only to find that some schools are not willing to make any fundamental changes in the business of teaching and learning. If the school itself does not value the program, it is unlikely to provide any significant changes. Success is more than identifying a good program and importing it (Fullan, 1993). The mathematics leaders and school administrators should explicitly value mentoring, and teachers need to be provided with on-going support for effective implementation.

Supporting the Transition from Industry to Education

To be highly qualified as a mathematics teacher according to *No Child Left Behind*, an individual needs to demonstrate mastery in mathematics, have certification, and hold a bachelor's degree. There are numerous alternative pathways to mathematics teaching that exist. As a result, individuals from industry can qualify to teach without any experiences with or support from a college of education. In a study of novice teachers in New York City, Darling-Hammond, Chung, & Frelow, (2002) found that new teachers who had taken alternate pathways into teaching felt less well prepared than teachers who came from teacher education programs. This sense of preparedness was the strongest predictor of teaching efficacy. One way transitioning people can benefit from colleges of education while they remain on-the-job is by enrolling in a carefully crafted graduate degree program designed for people transitioning from industry into teaching. Not only will a graduate program facilitate an understanding of teaching and learning, the degree itself will provide an increase in

salary, which is important for most people entering a low-paying profession.

Through a collaborative effort, school districts and higher-education institutes can work together to provide an effective program to initiate these novices and provide a multi-layered approach to mentoring through a paid internship. For example, **Transition to Mathematics and Science Teaching** (TMAST) at the University of Central Florida and Orange County Public Schools (OCPS) has formed such a partnership which is now in its third year. TMAST novice mathematics teachers begin the transitioning process during summer; they take nine semester hours of education classes as they work towards a 36 semester-hour Master of Arts in Mathematics Education. At the same time, TMAST teachers obtain a certificate of eligibility from the state department of education. Once a person obtains the certificate of eligibility, he or she can be hired to teach mathematics and is considered *highly qualified*. To receive a certificate of eligibility the applicant must have a bachelor's degree and either pass the mathematics subject area exam or else have the required coursework on their college transcripts.

Like many alternative pathways to mathematics teaching, TMAST has an accelerated classroom entry for novice teachers. This makes mentoring all the more crucial. Towards the end of the first summer semester TMAST teachers are hired by OCPS to teach, as part of an **on-the-job paid internship**. Some schools provide job-sharing positions where novices work half days sharing the regular load of the traditional mathematics classroom while others work full time. They teach during the day and attend class two nights a week during the school year. During the second summer semester the TMAST teachers take nine more semester hours and graduate.

With this collaborative model between an institution of higher education and a school district, critical mentoring roles are shared by several individuals creating a multi-layered design of support. The multiple roles in this model include a school-based accomplished teacher mentor, other school-based personnel, a university-based internship coordinator, university professors, and classmates, as described below.

Multiple Layers of Mentoring

The **school-based mentor** is an important role that should be held by an accomplished mathematics teacher. In this model, consistent with the NCTM position statement on induction and mentoring of new teachers (NCTM, 2002), the school district and a college of education frequently collaborate to assure the school-based mentors have access to high quality professional development where their communication skills can be honed. This is important, as many excellent teachers know good teaching when they ee it, but have a difficult time pinpointing and articulating the reasons a lesson is successful. Mentors should be provided with opportunities to sharpen their abilities to verbalize explicitly the many complex and often nuanced instructional and management activities in teaching.

Teachers entering the teaching field from a college of education have a traditional internship through which a college student works in the classroom of a well skilled teacher and takes responsibility for teaching in incremental steps. With the TMAST model, the novices enter paid internships either half time or full time, and they either have their own classroom (full time) or share a classroom with another TMAST teacher (part time). Their salaries are paid by the school district.

Finding time for the mentor to meet with the novice is critical and challenging. According to NCTM (2002), schools should set aside time specifically so that the beginning teacher and the mentor can work together. Common time should allow ample opportunities for the school-based mentor to demonstrate planning, share resources, and assist in completing required paperwork that often can seem overwhelming to a new teacher. Shared time also allows the mentor the chance to talk to the novice and develop a relationship. All of this is especially important since people primarily learn new patterns of behavior through interactions with others (Fullan, 1993).

How can we provide release time for school-based mentors from their classrooms? Through planning and collaboration, we have found a few different scenarios that work. Since most schools have several support positions filled by individuals who are highly skilled and who don't ordinarily spend time in the classroom with students, one way to provide release time is to call occasionally on these individuals for help. For example, in most OCPS schools a *curriculum resource teacher, instructional coach, or administrator* can assist with providing a school-based mentor release time to work with a full time novice teacher or just as importantly, release time for novice teachers to observe their mentors or other skilled teachers. The resource

teacher can teach a class for the mentor and the novice on a fairly regular basis, thus allowing them to observe each other teach. If mentor and novice are allowed a common planning time to enrich and inform the mutual observations, the relationship grows even stronger.

In the second scenario, two novices job share in a paid internship and they share one mentor. Since a typical teaching load is 5 classes of math, with one planning period, each novice teaches 3 classes (for a total of 6 classes between them), and the unused planning time can be 'given to' the school-based mentor. Once the school-based mentor's teaching load is reduced, she will have time to dedicate to mentoring. Both novices can conduct their planning either before or after school, and the school-based mentor will have ample opportunities to observe the novices teach and collaborate with them. The school-based mentor will also be in a position to teach a class for the novices, thus affording them opportunities to observe other teachers. When release time is afforded, there are opportunities for the school-based mentor to observe and co-teach with the novices and also to arrange valuable opportunities for them to observe other more accomplished teachers.

Another layer of mentoring is provided by the **university-based internship supervisor**. Since the novice teacher is enrolled in a one-year internship course (2 sections) with the university, this role is supplied by individuals who might otherwise have been assigned senior interns going through a college of education program. Our TMAST internship supervisors ordinarily meet and/or observe their assigned teachers once every two to three weeks. This supervisor provides both formal and informal assessment. Because collaboration is crucial, the supervisor is encouraged to keep an open and active line of communication not only with the new teacher, but also with the school-based mentor and the school principal or administrator. They should also be involved in helping the school-based mentor plan mentoring activities.

Having specific forms to be filled in for the observations by both the university-based internship supervisor and school-based mentor can be helpful, as can a journal that briefly recounts meetings, observations, questions, or concerns. Leaving a paper trail is an important part of accountability and provides for a point of discussion as the school-based mentor and the university-based internship supervisor work together for the benefit of the novice. Some specific examples of what we have found to be helpful include systems and procedures for frequent and regularly scheduled collaboration, job descriptions (expectations), regular follow up emails and reminders, mid-term and final evaluation reports, journals, and telephone conversations. All of these help to ensure the novice teachers are provided with the support they need.

College of education courses can include ample time for discussion and questioning about specific classroom and teaching needs and the development of a **network of peers** who can support each other in another layer of mentoring. Having the status of a student uniquely situates the novice to apply immediately what is learned in college courses to daytime teaching practice. The fact that the novice has access to **college professors** provides further support. The professor can facilitate the application of learning to the mathematics classroom of the novice. For example, while taking a methods class the novice will likely learn to use manipulatives for instructional purposes. The professor can assist the novice in planning to use manipulatives effectively, and support them in becoming reflective practitioners through assignments and discussions with their peers. Furthermore, if enough novices are enrolled at the university, the graduate degree program can be designed so that the novices proceed through the program in a cohort where novices learn and grow with each other as they complete their program of study and thus can mentor each other.

We have found that effective mentoring and support are valuable beyond the first critical year. Often students in cohorts build strong relationships with each other that outlast a university program or when teachers move to assignments at other schools. Furthermore, in a model such as TMAST, with a paid internship and supportive first year, teachers are likely to be rehired at the same school the following year. That puts the novice in a very beneficial situation of continuing a relationship and working with her original school-based mentor as a colleague.

The last important layer support for the mentoring process comes from **administrators**. In a model such as TMAST, school administration plays a critical role. Hargreaves and Fullan (2000) found that when new programs do not work, often it is because it is not considered an integral part of teaching. The multiple layers of mentoring should be embedded in the school culture, and the expectations of all mentors should be explicit and supported by the principal.

Conclusion

Effective mentoring programs are an embedded, well understood, part of teacher induction programs. It is important that this support system is not reduced to a single individual, in particular, a busy colleague who is "assigned" to a novice. Instead, it should be a complex system comprising several individuals and organizations all working together to best meet the needs of a new teacher.

In order to support the population of mathematics teachers who are coming to education from industry, mentoring is more important than ever. Many of these people are not entering America's classrooms at the end of an education program in which novices are under the supervision of, and in the classroom of, an experienced teacher. In fact, they often come to teach with little or no knowledge of teaching and learning, or experience with children. But they do have knowledge of mathematics. They are a valuable pool of knowledgeable people who have a strong desire to teach, and we cannot afford to lose them. We have an obligation to help them to become what they desire: Effective teachers who remain in teaching . One of the best ways to stem attrition and create effective mathematics teachers is to support them, with mentoring, as they learn to love to teach.

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