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A CENTURY OF LEADERSHIP IN
MATHEMATICS AND ITS TEACHING

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Promoting Leadership in Doctoral Programs in Mathematics Education

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Mathematics educators have many different opportunities to reflect leadership throughout their careers. High quality doctoral programs provide a rich and stimulating environment that supports the development of leadership qualities. This paper describes some ways that leadership can be fostered in doctoral programs in mathematics education.

Note: In preparation for this paper I asked some mathematics educators for suggestions about how leadership might be developed within doctoral programs in mathematics education. Many ideas reflected in this article are a result of their input. Thanks to the following leaders in mathematics education who responded and provided feedback that helped shape this paper: Jenny Bay-Williams, University of Louisville; Jonathan Bostic, Bowling Green University; Kelley Buchheister, University of South Carolina; Oscar Chavez, University of Texas-San Antonio; Kathryn Chval, University of Missouri; Dana Cox, Miami University; Zandra De Araujo, University of Missouri; Barbara Dougherty, University of Missouri; Anne Estapa, Iowa State University; Gloriana González, University of Illinois; Douglas Grouws, University of Missouri; Charles Hohensee, University of Delaware; Dusty Jones, Sam Houston State University; John Lannin, University of Missouri; Vena Long, University of Tennessee; Jim Middleton, Arizona State University; Kevin Moore, University of Georgia; Sam Otten, University of Missouri; Barbara Reys, University of Missouri; Jack Smith, Michigan State University; Denise Spangler, University of Georgia; John Switzer, Texas Christian University; Cynthia Taylor, Millersville University; William Zahner, Boston University; and Jeremy Zekowski, University of Alabama.

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Leadership is characterized in different ways. Dwight Eisenhower said, “Leadership is the art of getting someone else to do something you want done because he wants to do it.” (and it seems appropriate to mention that the ‘something’ needs to be done.) Thus leadership reflects the ability to influence and mobilize others toward a common goal. Eisenhower went on to say, “A sense of humor is part of the art of leadership, of getting along with people, of getting things done.” These comments remind us that leadership is action, not a title or a position. Leadership occurs in families, in classes, in departments, committees, schools, and professional organizations.

Different leadership styles have been studied, researched and labeled. For example some leaders take charge, are directive, hands-on and tend to micro manage, while others delegate responsibilities and monitor what is happening, but generally stay out of the fray of day-to-day tasks/decisions. Regardless of leadership style, there are important qualities associated with successful leaders such as a willingness to accept responsibility and establish a vision, along with planning, motivating, communicating, utilizing abilities of others, resolving conflicts, and progressing toward goals. Good leaders model skills that nurture the next generation of potential leaders.

High quality doctoral programs in mathematics education provide an environment where a common core of

knowledge is developed (AMTE, 2003). Concurrent with the development of core knowledge, high quality doctoral programs provide opportunities that encourage doctoral students to develop and reflect on the qualities of leadership. There are numerous books about leadership (Balka, Hull & Miles, 2010; Bush, 2003; Kaser, et al., 2006; NCSM, 2008) and some institutions of higher education have established centers to help promote and develop leadership (See <http://www.illinoisleadership.uiuc.edu>). In my judgment, good leaders are the glue that holds a group/task force/committee or project together, and the grease that keeps the gears operating smoothly. Thus, the underlying premise of this paper is that leadership is not taught as much as it is learned through observation, experiences, and apprenticeship, many of which can be provided during a doctoral program. Leadership, like swimming or playing the piano, cannot be learned or developed by reading about it.

How Are Leaders Developed?

Doctoral programs don’t start from scratch in developing leadership, as doctoral students have already exhibited leadership in their prior work. Early leadership skills may evolve from working with siblings or other peers. It may have been as a class officer, student council, or leader of school sponsored clubs or organizations in high school or college.

It may have been community service or church involvement. It may have been in the Boy Scouts, Girl Scouts, or 4H. It may have been department chair, task force leader, or union representative. It may have been serving in the Peace Corps. Most of these examples provide situations where people volunteer and go out of their way to become involved, knowing that it will require a commitment of time and energy. Engaging in such activities indicates a willingness to go beyond standing on the sidelines. Leadership is having a vision and working to help make it happen and being willing to assume responsibility for whatever happens.

The central issue of this paper is what doctoral programs in mathematics education can do to develop and foster leadership qualities. Doctoral programs can promote leadership through mentoring and modeling reflected by faculty members as well as from other doctoral students. While leadership skills can be honed, the passion and desire does not come naturally to everyone. Leaders have an internal drive that allows them to step up and assume responsibilities when the occasion arises. This internal drive does not insure successful leadership, but it is a necessary condition for effective leadership.

How does one person get an opportunity to be a leader, and another person does not? To some extent it is the luck of the draw, or being in the right place at the right time. This can be at the local, regional or national level. Excellent illustrations of the serendipitous nature of paths resulting in leadership opportunities have been well documented (Wilson, 2003). Having said that, everyone can enhance leadership opportunities by becoming a recognized scholar. The mathematics education community is small, and word spreads rapidly with regard to such individuals, so successful scholarship can result in many leadership opportunities.

Some Ways Doctoral Programs Promote Leadership

The books cited earlier about leadership describe leadership processes and ways to go about developing leadership skills. High quality doctoral programs in mathematics education instill the importance of leadership in their doctoral students and make them sensitive to the responsibilities that accompany various leadership roles. Here are some specific examples shared by people (acknowledged in the footnote) as they reflected on ways a doctoral program either facilitated their leadership ability or could do so.

Experiencing well-structured learning activities. Teachers exhibit leadership in the way their classes are organized and taught. Expectations are made clear, intellectual discussions encouraged, stimulating and challenging questions raised, support and direction provided when needed, and students are treated fairly. There are opportunities to become involved in group-work that allows

student leadership to flourish as projects are completed and reports made. The leadership qualities reflected by teachers (in doctoral programs or elsewhere) influence the way doctoral students organize, manage, and teach and thereby reflect leadership qualities they have assimilated over the years.

Delivering professional development. Involving doctoral students in designing, organizing and delivering professional development for K–12 teachers can be a significant factor in developing leadership. Most doctoral students have recent K–12 teaching experience, so that knowledge and experience brings a sense of creditability that can enhance the quality and relevance of the professional development. Direct involvement in planning and delivering professional development allows doctoral students to witness leadership reflected by faculty members, and at the same time helps develop confidence in their own ability to support the effort and lead future in-service professional development efforts.

Modeling by faculty members. Observing the leadership abilities demonstrated by faculty members is a powerful influence in developing leadership. Multiple mentors reflect different talents and approaches to leadership, so observing and experiencing them helps doctoral students adapt leadership styles that are aligned with their talents. These encounters may occur in structured or casual conversations. For example, faculty members often mentor doctoral students while teaching methods courses or supervising student teachers. It may occur in informal conversations, as discussions about ethics or professionalism occur. Collectively these experiences provide opportunities to observe a range of leadership skills in action.

Mentoring by advanced doctoral students. Having a self-governance committee of senior doctoral students mentor new doctoral students supports and develops leadership skills. Senior doctoral students assume leadership positions and use their knowledge and experience to mentor entering doctoral students. Among other things they provide some dos and don'ts based on their personal experience in the program. The mentoring provided can be instrumental in facilitating the successful transition to becoming a full-time doctoral student. Concurrently, the leadership abilities of senior doctoral students grow from their mentoring experience.

Coaching. Coaching takes many forms and can be done by different people (Chval, et al., 2010). The role of the coach may be a sounding board, that is someone who listens and helps a person articulate the problem. It may be talking through a situation to identify the problem and explore different possible solutions. It may involve asking questions, offering substantive ideas, role playing, helping frame options, discussing the pros and cons of different options, and encouraging the formulation of solution or plan of action that addresses the problem. The coaches' role is not to tell someone what to do, but rather help them sort out the available options.

Planning and organizing activities, such as a colloquium series. Institutions and departments have various focused initiatives that are independent of courses. It may be a colloquium series or invited speaker series. Many people reflected on the positive leadership experiences resulting from these opportunities for them as doctoral students. Helping to organize the initiatives provided interaction with many different doctoral students and faculty members, including faculty members from other institutions. It often introduced them to and provided ways of interacting with other leaders in the mathematics education community. In the process, much is learned about programs, ideas, or research and fresh national/international perspectives result. Success in making decisions about the topics, participants, and how best to organize the activities promote greater self-confidence in leadership skills.

Serving on committees. It might be service on a graduate student committee or a department and college committee. For example, being a non-voting member on the search committees for new faculty members in mathematics education can be a particularly eye-opening experience, as they witness how job candidates were selected, and participate in the interview process. This experience not only provides multiple perspectives regarding leadership (as shown by committee members as well as the candidates), but it provides valuable preparation for when the doctoral students will be engaged in job searching.

Scholarly writing. Preparing co-authored manuscripts and getting them published creates leadership opportunities among a team of authors. Teaming with more skilled writers is not easy but is helpful. Recognizing when to take the lead and when to step back and follow are both indicators of leadership. How to team and work with co-authors is a valuable process to learn. The scholarly publications that result can provide paths toward greater visibility and can open unforeseen leadership opportunities.

Involvement in professional organizations. AMTE, NCTM, RUME, PME, MAA, and SIG/RME, as well as state affiliates inform our work and thinking. Being a member of these organizations is the first step. Yet, it may be difficult for doctoral students to initially become involved within these organizations. Volunteering is a good way to start. It may be volunteering to review proposals or manuscripts. It may be volunteering to serve on committees. Whatever the role, active involvement in professional organizations establishes valuable networking that can lead to an array of future leadership opportunities. Leaders active in professional organizations (faculty members or other doctoral students) find ways of involving others in the organizational activities.

Presentations at meetings. Developing and submitting a proposal for a presentation at a professional meeting reflects leadership initiative, and this can be accomplished individually or via a team. Assembling a proposal, organizing the actual

presentation, and delivering it with gusto are all indicators of leadership. A quality presentation at a professional meeting often results in meeting other people with similar interests. This experience instills increased self-confidence and fosters leadership potential.

Nearly all of the above examples reflect beyond course experiences in doctoral programs and serve as pathways toward developing leadership. The recognition that course work alone is not sufficient in doctoral programs was one of the points of discussion at a national conference on doctoral programs in mathematics education (Blume, 2001). High quality doctoral programs in mathematics education provide a wide range of opportunities for beyond-course experiences, many of which provide leadership skills an opportunity to grow and mature.

Wrapping It Up

There is no single right path for doctoral programs in mathematics education to develop leadership, just as there is no one-size-fits-all in preparing doctoral students. Leaders are influenced by many experiences, and the best course of action for doctoral programs is to provide as many of these different experiences as possible.

Developing leadership is a cyclic process that develops over time. One becomes a leader only if the person takes advantage of opportunities when they arise. Once a person demonstrates leadership abilities, other leadership positions generally follow. If the person consistently takes advantage of the new leadership opportunities by doing an effective job, then even more opportunities arise. Thus leadership becomes self-perpetuating. The challenge then becomes being selective in accepting leadership opportunities to insure that they are aligned with your beliefs and workload.

In closing, it is safe to say that high quality doctoral programs provide a rich environment to develop leadership that will serve graduates well as they move into their chosen careers. In a sense there is a symbiotic relationship between a leader and those being led. Leadership experiences are mutually beneficial to both parties, i.e., each needs the other. Consequently excellent leaders help develop new leaders and thereby strong and effective leadership becomes self-sustaining.

John Quincy Adams characterized leadership by saying “If your actions inspire others to dream more, learn more, do more and become more, you are a leader.” Let us as individual mathematics educators aspire to being such leaders. Doctoral students represent the next generation of scholars and potential leaders in the field, and their leadership ability will determine if and how the mathematics education community will continue to grow and move ahead.

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