

3. Partners in Change

Jule Dee Scarborough

It is important to expand the learning experiences beyond the individual middle and secondary schools. The most effective method is to create partnerships with representatives from higher education, business, industry, and community organizations and to seek support from the administration – primarily the building principals. These partners in change help to create exciting opportunities for both the participating teachers and their students.

Leadership: A Moral Responsibility of Higher Education

According to Burns (1978), *transforming leadership* engages leaders and followers in a mutual relationship that raises both to higher moral and ethical levels. Manz and Sims (1989) define *superleadership* as that process through which leaders develop others to be leaders.

The university has a moral responsibility to collaborate with and support, or lead where necessary, the ongoing development of K-12 teachers, administrators, programs, and educational processes. Many would argue that partnerships are already in place between universities and schools or districts. Some might even question that this kind of leadership role is a moral responsibility, especially those in higher education who consider themselves content-discipline specialists or those instructors and professors of departments not directly linked to colleges of education.

The morality of the issue lies in a code of behavior inherent in our mission: using our knowledge, skills, and capabilities to build, strengthen, and question the educational aspect of the community within which we serve. However, a review of government reports and the literature suggests that most community service historically has consisted of working with business, industry, municipalities, and community-health and other non-educational organizations – with which the universities feel discipline or field-specific ties.

Possibly that is because we are segregated by disciplines with very narrow departmental missions and definitions of our responsibility; we have no rewards or immediate gains from working with schools, and we do not really understand that by working with schools we might be able to prepare students better for our own classrooms at the university. In working with teachers, we begin to understand the learning contexts from which our students come, gain insight about them and what they know, and influence what they learn. We also gain exposure to ideas about teaching and learning, areas in which most faculty have little formal background. Finally, the ultimate purpose for working with schools, especially in mathematics, science, technology, and engineering, is that most disciplinary departments offer general education courses that all students must successfully complete before entering their major degrees. Two-year technical programs require general education preparatory courses before the major courses or program can be completed. These factors alone should motivate us to work with schools.

A solid K-12 educational program that evolves with our highly technological society is vital if the nation is to maintain its global leadership, research status, and technological

advancement. But we are struggling, except for some pockets of quality K-12 education. After 23 years of working intensely with schools to develop curricula and implement best practices and new strategies to improve student achievement in mathematics and science, it is my conclusion that all of us, across all disciplines, must collaborate with schools to sustain high-quality K-12 education.

Communities of Practice: Business, Industry, and Community^{*}

It is critical to provide learning experiences that make academic knowledge and skills come alive; to provide more authentic exposure to the concepts, principles, facts, and theories in action in the workplace and in communities of practice and across career contexts. Although most partnerships have the goal of improving education for students, teachers also benefit. Learning outside of the classroom extends teachers' knowledge across contexts and moves it beyond theory, principles, or concepts.

Teachers have repeatedly asked us for real-world learning experiences first, before the students, so that they gain exposure and a base from which to build broader and deeper learning experiences and curricula. Teachers have let us know, too, that they need continuous or ongoing opportunities to do research and learn how MSTE is used across fields in communities of practice and that what they learn deepens and begins to make more sense with repeated exposure. A program of external exposure is the best way to deepen and extend learning. (The term Community of Practice Quest, CPQuest, refers to a teacher's or student's search for standards-focused learning in a real-world environment or community of practice. See the appendix at the end of this chapter for details.)

A few events can create awareness, but a program of ongoing events with BIC partners deepens learning while providing authentic contexts and engaging with those in the communities of practice. Most businesses and organizations desire to be good corporate citizens and assist educators in any way that they can, but they are limited in what they can do by personnel and financial constraints. Educators have to make it easy for companies to say yes to participation by spreading the load equitably among BIC partners. Rotate the events across sectors and organizations, if necessary, and tap each partner only once every two years or so.

Begin with a few events and expand a few events into a program where teachers and students can engage with those in communities of practice on a regular basis, using the CPQuests as an ongoing method to make learning real. Keep the process simple, yet formal. Make it someone's job to keep the program going and growing. Prepare the partners, teachers, and students for the CPQuests so everyone is ready to learn or to provide what is being sought. The partnership program, as a component of the ongoing teaching and learning professional development, will go far to develop exceptional teachers who motivate students to achieve at higher levels; more importantly, this exposure will extend their self-perceptions and help students realize career potential previously not explored.

^{*} Vicki Benson served as our industrial liaison and created exceptional opportunities for teachers in communities of practice.

Principals in Partnership – Leading Change

School principals are possibly the most critical partners when working on change with teachers in formal educational settings. It is hard to maintain sustainability without their visible, active, and continued leadership toward the goals of any grant or initiative.

One of the principal's most important tasks – removing barriers to performance – has attracted our particular attention because our initiatives focus primarily on teacher performance as a way of improving student learning. Many of the barriers are easily removed, and when removed, markedly increase what teachers are able to accomplish. Often, when we engage in a project, we acquire responsibility for identifying barriers and assisting in their elimination, mainly because we are external to the school district and can discuss things teachers sometimes do not feel comfortable broaching or bringing to the principal's attention.

Burns (1978, p. 19) defines *transforming leaders* as those who truly believe that “leadership is inseparable from follower's needs and goals.” The essence of the leader-follower relationship is

the interaction of persons with different levels of motivations and of power potential, including skill, in pursuit of a common or at least joint purpose....Power is utilized to realize common goals and purposes and not for purposes of exploitation or manipulation. A unique aspect of transforming leadership theory is its moralistic or ethical component.

Principals who believe in transforming leadership realize that it is not all about them; the greater good is to develop students to their highest possible potential. They understand that, although they lead the teachers, they also work *for* the teachers by creating an environment and climate where learning by all is the expectation and context of operation.

Enlightened principals intuitively put into practice the superleadership theory (Manz & Sims, 1989), where they lead others to lead themselves; they empower others to demonstrate superleadership by actually engaging in leadership. They provide a working environment where teachers can develop a culture of functioning independently *and* through teams and where students also begin to engage in self-leadership.

In a world where we automatically function primarily within the “transactional” leadership construct, through which individuals make exchanges such as salary for teaching, the focus can be very different. Transactional leadership focuses on the self-interest of both parties in an exchange that is mutually beneficial (Burns, 1978).

Transforming leadership is about something else. In our initiatives, we apply the transforming leadership philosophy, using the superleadership model as well, while striving to develop teachers as leaders of learning. This is sometimes difficult, as most teachers really operate in a more transactional environment, especially districts in turmoil or crisis. That is, however, exactly when transforming leadership can reap the greatest results.

The following sources are valuable references when considering the context within which principals are administrators and leaders. It is a complex and turbulent context, where the challenges are great and the rewards few.

Senge et al.'s (2000) *Schools That Learn* helps us to understand what a school can or should be as a learning organization. It is an insightful resource from which to draw questions, seek analysis, and identify strategies and solutions. His definition of learning, which helped me to crystallize my own vision and goals for teaching and learning, when combined with a transforming leadership philosophy using the superleadership theory while modeling good leadership behavior, can set the stage for exciting and sustainable change.

Shumaker and Sommers (2001) illustrate how to bring about change by involving others through stories. They make the point that in learning something, we have to admit that we need to know, or do not know, something. That is an important issue when we work with teachers during the teaming component. I would ask them to stop a moment, clear their minds, and then give themselves the freedom to admit when they wanted to learn about something they “did not know.” Once they did that, they worked so much more effectively. They moved quickly into a comfort zone with each other where posturing disappeared, honesty with each other became an openly practiced value, and even the know-it-alls began to act more positively.

Admitting that we do not know or that we need to know something runs contrary to what we as educators stand for. Teachers have been conditioned to hide what they do not know rather than openly seeking to learn more. This is counterproductive to a learning culture; in fact, there cannot be a learning culture where this is true. Principals are the ones who must change this type of environment or climate. Shumaker and Sommers (2001) show others how to make changes that move the culture to a higher level, leading through modeling. They encourage extending the classroom to other learning places, to group activities in nontraditional ways: encouraging interdisciplinary curricula, teaching teams, learning through multiple intelligences, authentic assessment, use of portfolios, and much more.

Modeling goes far to bring about change. Shumaker and Sommers (2001) offer change models and use mental maps as some of their strategies. They address sources of problems by mentioning a workshop by Phil Schlechty, who identifies the basic behaviors exhibited by teachers when confronted with change – “trailblazers, pioneers, settlers, stay-at-homes, and saboteurs” (p. 81). His descriptions fit perfectly with what we have observed as well, and are an informal but direct way of discussing change and roles with teachers. Shumaker and Sommers’s model for continuous growth through feedback spirals also has a direct fit with the process we used throughout our initiatives (p. 136). The principal’s involvement and modeling are critical to the kinds of change we are leading. The core personnel and program leaders, intuitively or intentionally, modeled best teaching and learning practices, leading by example.

Tonnsen (2000) examines instructional leadership and concludes that the research is clear about the requirement of the principals being knowledgeable, and “that the principal’s authority is derived from their knowledge competence” (p. 10). We always included a principal’s program of development that ran concurrently and addressed role, leadership for change, and best practices. Sometimes we were able to engage them, and sometimes not. For example, it was difficult to engage the Rockford principals as a group; some participated individually, when invited, and did support their teachers. The principals for both regional endeavors, however, were active and visible in their support, making accommodations for what teachers needed to accomplish, providing full support to help them achieve their visions and missions, and following them into the classrooms to observe during the pilots.

Drake and Roe (1999) address the social context of schools and describe the principal as a person and a professional: job description versus reality; the school communities; the theory, research and principles upon which action should or could be based; views of the organization; and major tasks for the individual learner. They consider assessment of performance and discuss staff development, society-related problems, management, and, of course, leadership. They list factors conspiring against instructional leadership and, as a solution, urge schools to employ a manager or services coordinator who can relieve the principal of particular management duties. Their chapter on creating “appropriate structures to improve learning” (p. 195) provides a list of what we do, now, often in spite of what we know.

In the sessions with teachers, we mentioned that what they were going to learn was not necessarily new but were successful practices that had been discontinued. Our initiative was as much about bringing back good practices and behaviors as introducing teachers to new ones. By this, I meant issues such as Drake and Roe (1999, p. 207) cite:

- We do not teach as well as we know how.
- We have not generally developed school environments that provide the best kinds of learning situations.
- We still teach the textbook and subject matter instead of the child.
- We structure for groups instead of individuals.
- We still operate schools as if all teachers are the same and all children learn the same things at the same rate in the same way.
- We still teach as if the school is the only place a child can learn.
- We still teach as if children can learn only from adults, and certified adults at that.

Drake and Roe further discuss a variety of models and strategies, making the point that plans exist for softening the inflexibility of school structures. In other words, we have viable options. Drake and Roe pose a question, “As principal, will you have enough leadership ability and creativity to structure a school so that teaching and learning are improved?” (p. 223).

Leadership, according to Drake and Roe, is where you find it: teacher, student, staff member, parent, board member, or other (p. 131). They consider the principal’s primary task one of developing, nurturing, and reinforcing leadership wherever it may be found. This seems to be transforming leadership, using the inherent superleadership model: one that develops others to be leaders (p. 469).

Drake and Rose also have a fairly analytical chapter on staff development, following through with their strategy of identifying issues and alternatives or solutions, also focusing on the principal as an expert. They confirm the role that this university has played, especially those involved in this initiative. In discussing leadership, they quickly admit that old patterns of behavior will not work if principals are to meet today’s needs or opportunities for leading. They review literature and theory on leadership, and although they do not mention “transforming leadership” (Bass, 1978) as we discuss above, their list of outcomes for leadership as “a deliberate process that results in the following outcomes for all in the school community” (p. 31) works for us:

1. Working collaboratively toward an ever-expanding vision of excellence in the achievement of organizational and personal/professional goals and objectives.
2. Creating a threat-free environment for growth so that the creative talents and skills of each person are maximized.
3. Encouraging and building working relationships that are individually and organizationally satisfying, unifying, and strengthening in the realization of mutually determined goals and objectives. Such relationships result in effective group problems solving.
4. Optimizing available human and material resources. (p. 131)

Webster (1994, p. 4) discusses learner-centered principals, or the principal as teacher of teachers. He addresses how to use authority appropriately to achieve effective learning climates, maximize learner growth, and direct an organization of instruction and evaluation. He offers five premises that contradict conventional management-oriented principalship:

1. Effective principalship is a means to the end of maximum learner growth.
2. Effective principalships are principal teachers, teachers of teachers.
3. Effective principalship is both eclectic and pragmatic.
4. Effective principalship is an experience-derived art.
5. The skills of discourse are the most important ones in education because discourse is the “master switchboard” directing all content, learning and teaching.

Kaiser (1995) is one of many who include a discussion of Deming’s 14 points to educational administration. In our particular case, many of us are from the industrial side of education and practice. As a college of engineering and technology, with partners from mathematics and science, we are immersed in industrial concepts, philosophies, and practices, especially related to quality. Therefore, Deming makes points easily used by us or interpreted and used in our work with schools, teachers, and administrators. Some of my favorite Deming points for our context here are: “break down barriers; remove barriers that rob people of pride of workmanship...eliminate the annual rating and merit system; institute a vigorous program of education and self-improvement for everyone...put everyone to work to accomplish the transformation...adopt and institute leadership” (p. 387). Possibly a business analogy will fit as well. Rather than focus on increasing the profit margin, if one focuses on improving the quality, conditions, processes, and education, the outcome will be improved profit margin. Rather than focus on teacher evaluation, we might get better results by working with teachers to self-assess, identifying strengths and areas to grow, and providing ongoing opportunity and support to learn.

In summary, principals are absolutely critical when engaging in complex programs of staff development for targeted change. Without their direct, active, and visible participation, the process can be much more difficult and the accomplished changes have less potential to be sustained.

Conclusion

It has been my mission to initiate and lead partnerships across campus with faculty in many different departments or fields, extending to other institutions of higher education, specialty schools, and community colleges, as well as with a great variety of business, industry, and community organizations for the purpose of supporting advancement in secondary MSTE education. Those from non-education fields or disciplines add depth, broader contexts, understanding of knowledge and applications, and different perspectives that can greatly enhance teachers' knowledge, skills, and ability to build more relevant and deeper learning experiences. The richness of knowledge and applications, the level of depth, and the variety of contexts for mathematics and science are much greater when we involve the broader community. Also many of these individuals are engaged in research that generates new knowledge, so their research skills and work with partners, such as national laboratories or the scientific community, add to what they bring the teachers.

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Appendix

1. *Initiating the business, industry, and community (BIC) partnership for standards-based CPQuests (Community of Practice Quests)*

Very often a partnership would be initiated, but after the one or two visits, things seemed to fall apart. Schools generally did not follow through. It was usually left up to individual teachers to decide on the level of effort to expend in sustaining contact. In all fairness to teachers, unless they had release time, they could not make their phone calls until after the end of the business day, and no one could be reached then. Industry, too, is experiencing great difficulty in today's competitive and turbulent environment and could not always dedicate an employee to sustain the partnership. It is important to "make it someone's job" to sustain contact, but this does not have to require extended effort. It is all about how those engaged design the partnership and connection process.

2. *Developing the BIC partnership process*

Partnership can operate in several different ways. The optimal method is to have a coordinator, whether for a grant providing teacher professional development or for a school, district or several schools working together. Alternatively, assign responsibility to a volunteer at a school. The administration needs to provide release time for a teaching professional or an administrative person. Another viable choice is to have a responsible parent volunteer for a year at a time for this. Many parents have their own networks within the community. Another alternative is a team of parents, with each member or subcommittee of the overall team serving to coordinate different BIC sectors.

Once the method is chosen, begin with written agreements. BIC partners need to know exactly what is needed or desired. They have to assign the activity to someone, which is difficult to do if the request is unclear. For example, if you want a field trip for your students, tell them the date and time, what you want them to discuss, what type of experience is desired for students, and to what careers or personnel processes to expose students. If it is for teachers, the same holds true. One good method is to generate a list of questions to be addressed. Without direct and detailed requests, the result will be a general tour and question/answer session, which could be beneficial, but may be more awareness-oriented rather than addressing specifics at a preferred depth. Another example: when asking for financial support, be sure to create a budget, explaining each item in detail, which learning activities the request will support, the expected outcomes, and even what standards are going to be achieved.

3. *The agreement*

It is important to generate a vision for partnership activities, determine which organizations have the capability of helping achieve the teacher development or curricular mission for each school year, and create an introduction with the vision and year's mission clearly stated, as well as a one-page summary of all requested experiences

for the entire year and a one page form for each request. The summary form and each individual event form should have approval sign-offs. Thus, it is easy to determine if something will occur or is not possible.

Table 3.1 Partnership Introduction, Example

Partnership Vision:	To build teacher and student knowledge about technical careers requiring an MST foundation
Mission 2003-04:	To expose teachers and students to the manufacturing sector careers
School:	Name of School
Partnership Manager:	Contact Name and Information
(Teacher, parent, etc.)	
Principal:	Name of Principal
Summary 2003-2004 School Year	
Event 1:	Date, attached form #, focus; sign-off
Event 2:	
Event 3:	
Event 4:	

Table 3.2 CPQuest Event Form, Example

CPQuest Event Form		
<i>(Business, Industry and Community Partnership Community of Practice Quest)</i>		
Event Agreement Form 2004		
(Example)		
Number of Teachers:	Disciplines:	Teaching level:
Number of Students:	Student ages:	Student grade:
Student Learning Standard(s):	Related to Course(s):	
Math		
Science		
Technology		
English		
Others		
Student assessment or expected evidence of learning:		
Project: (describe)		
Paper: (describe)		
Others: (name and describe)		
Suggested Learning Activity:		
Plant Tour		
Q/A session with the following career partners:		
Engineer	Scientist	
Human Resource Manager	Publications Director	
Shadowing: Name career track or specific person		
Interview(s): Name career track or specific people		
Others:		
Requested Date: Priority Date	Alternative Date: Second Date	
BIC Preference Date: Or, the BIC partner can suggest one of his/her own preferences here.		
Requested Time(s):	Alternative Time(s):	
School Contact:	Name, Email, Phone	
BIC Contact:	Name, Email, Phone	
School Approved:	BIC Approved:	
Signature	Signature	
Confirmation Fax/Email to be sent to BIC partner on:_____ (put date here)		
BIC Partner Fax/Email OKAY to School partner on:_____ (put date here)		

4. *Preparing partners for teachers and students*

Once the agreement is signed, someone has to be responsible for follow-up. We have found it best that the school send, email, or fax the partnership introduction form (Figure 3.1) approximately two weeks before the event with a confirmation, or we have used a simple follow-up form confirming the previously agreed upon event. The fewer forms, the better.

In addition, any information that can be sent ahead of time will assist the BIC partners in designing a more complete experience. For example, we have provided the BIC partners with all teaching and learning standards in a binder so that they will have them when we refer to them. They also have copies of information on performance tasks, rubrics, team visions and missions, and other materials, providing them insight into what teachers or students want to learn about.

5. *Preparing teachers or students for partners*

a. Choose learning standards

- i. Mathematics
- ii. Science
- iii. Technology
- iv. English (Communications)

b. Plan research focus of teachers or students

Teachers –

- i. Curriculum context for student learning
- ii. Real-world performance tasks for student assessments
- iii. Careers and educational requirements
- iv. Others

Students –

- i. Research community waste from the manufacturing sector
- ii. Career(s)
- iii. Research properties of materials (chemistry problem)
- iv. Others

c. Selecting BIC individual(s) as teaching and learning partners

- i. Research options for best alternatives for purpose
- ii. Determine which sector(s) are most appropriate
- iii. Make Contact

d. Preorganize learning – Design the CPQuest

- i. Gather information on organization
- ii. Study the information
- iii. Determine the learning and research pathway options, e.g., departments, personnel
- iv. Select pathway(s)
- v. Generate specific questions, issues; describe specific problems
- vi. Identify best type of expert to accommodate learning

- vii. Create information-gathering organization plan and process (forms, etc.) for visit
 - e. Target learning experience(s)
 - i. Determine how many visits to request to complete the CPQuest
 - ii. Describe each visit's purpose
 - f. Share CPQuest Plans
 - i. Network across teachers or students and share CPQuest plans
 - ii. Engage in peer cross-questioning to provide constructive criticism
 - iii. Make desired modifications based upon peer feedback

It is important that teachers and students participate in preparation activities. They must have a focus, individual or group goals, target questions, specific operations they desire to observe, individuals to shadow, and career requirements about which they are seeking information. In other words, they must design a partnership research or learning plan or quest (CPQuest), much along the lines of a WebQuest. They should study the organization from Internet websites or materials from the organization to ensure that they understand as much as possible about the organization. This will save the organization personnel a great deal of time. The planning is a great way to deepen learning and achieve greater gains through a CPQuest; in addition, many standards can be achieved through the planning and requesting process. It is important that teachers and students do this planning and initial research themselves. The pre-CPQuest plan sharing and constructive feedback is a way to strengthen the CPQuest plan, and sharing the CPQuest results will build knowledge across individuals and groups. The feedback will result in more substantial and better organized CPQuests.

6. *Engaging in CPQuest learning activities at BIC sites*

- a. Gather information
- b. Perform research
- c. Participate in learning activities

7. *Participating in post-Quest networking*

- a. Complete feedback questionnaire about learning opportunities
- b. Evaluate quality of learning experience(s)
- c. Network with others; share CPQuest results, determine what was learned

8. *Finalizing product required as evidence of learning*

Teachers – Infuse information and BIC learning experiences into the curriculum:

- a. Build curriculum
- b. Design performance tasks
- c. Develop career quest guidelines
- d. Create virtual tour

Students –

- a. Analyze data or information gathered
- b. Design solution to problem
- c. Draw conclusions about issue
- d. Assess learning
- e. Create virtual tours and websites/paper of results
- f. Share and network across student groups and classes