CENTER LEADERSHIP:

Putting It All Together

LOUIS TORNATZKY, *Southern Technology Council, Research Triangle Park, NC*

KAY LOVELACE, *University of North Carolina, Greensboro*

DENIS O. GRAY, *North Carolina State University, Raleigh*

S. GEORGE WALTERS, *Professor Emeritus, Rutgers, University, NJ*

ELIEZER GEISLER, *University of Wisconsin, Whitewater*

INTRODUCTION

The role of leadership in starting and maintaining a NSF Industry-University Cooperative Research Center is central. Few NSF centers have succeeded without an effective leader. The center director (or founder) is essentially an intrapreneur who devotes an enormous amount of energy and expertise into developing and founding an enterprise. In the early stages of a center, the Center Director's gathering resources, obtaining commitment from industry, faculty, and university administrators are paramount. Later on, the Center Director's role is fine-tuning and routinizing operations and building leadership skills throughout the organization.

Growth and evolution of the I/UCRC are the result of the leader's abilities to develop a distinguished faculty research core, obtain industry support, and nurture leadership in other center members. This chapter focuses broadly on leadership in an I/UCRC and is less operational in its focus than other chapters in the text. We start with the notion of leadership and how it applies to the cooperative research center. We then address several key leadership issues in an I/UCRC including exercising intrapreneurship, spanning organizational boundaries, creating cooperative research teams, managing a changing center, and knowing oneself.

What Is Leadership in a Cooperative Research Center?

In our everyday lives, we often use the term "leadership" to characterize those we think of as born or natural leaders. Since few people feel that they measure up as natural leaders, they often feel uncomfortable when thrust into leadership jobs and assignments.

The result is that they choose to focus primarily only on tasks and activities in which they feel skilled, and neglect the other, less familiar activities of leadership. So it is with cooperative research centers.

Since the assigned I/UCRC leaders usually come from distinguished scientific and technical backgrounds, too often the tendency is to focus exclusively on tasks that are primarily technical in nature and to ignore the interpersonal and relational aspects of leading a center. The result is often failure. The intellectual power of a research agenda can carry a center for a while, but only leadership can enable it to blossom.

Most views of leadership are consistent in their assumption that leaders are people who can effectively influence others to carry out activities beyond those that they would normally carry out. Behavioral science researchers have investigated numerous leadership theories, including the commonly held belief that leadership is based overwhelmingly on personality traits or characteristics that some people are born with and others are not. Unfortunately, this "great man or woman" view of leadership leads many to conclude that they do not have the ability to carry out the tasks and roles involved. Contrary to this assumption, researchers have found there are few traits that consistently predict leader effectiveness. In contrast, researchers have found that many people can be effective leaders, given sufficient intelligence to conceptualize the demands of the job and sufficient motivation to carry out the tasks involved. *In fact, intelligence is one of the few measurable traits that consistently correlate with effective leadership*.

A second theory of leadership suggests that different organizations require different styles of leadership, e.g., military, universities, business and industry, non-profits, and government vary substantially (Lord and Mayer, 1990). What is expected of a leader in industry differs from what is expected in academic institutions. Since I/UCRC Center Director responsibility spans these two worlds, their leadership must accommodate both styles.

I/UCRC stakeholders are either affiliated with industry or the university. Industry stakeholders include IAB members, scientists in member firms, other firms in the industry associated with the

I/UCRC. University stakeholders include center faculty, students, and university administrators. The Center Director must influence stakeholders in two very different environments.

While the leader/director must be someone who can influence the center's stakeholders and constituents, what is it that leaders must do? One framework separates leadership responsibilities from management responsibilities. Bennis and Nanus (1985) characterized leaders as people who "do the right thing," i.e., they have a strategic overview of the purposes of the center and the work involved and this perspective guides their work. In contrast, managers are people who "do things right." Both are important in an I/UCRC, but they differ in terms of the required behavior and, sometimes, in terms of who can fill the role. An effective Center Director needs to adapt his/her behavior similarly. For example, a Center Director must assign space and facilities. In these situations Center Directors need not consult the membership and often they can be managed by a capable administrator allowing the Center Director to focus energy on "doing the right thing." (See Figure 10-1.)

Thus, leadership, rather than management, is called for when the situation is non-routine and ill-defined. Consistent with this view, Heifetz (1994) has asserted that leaders are people who motivate their constituents to meet challenges that require adaptation or learning. Heifetz explains that adaptive challenges consist

Figure 10-1	Situations calling for directive, administrative skills.

Situations

Simple	Assignment of space, facilities and other resources among projects and faculty.
Factual	Decisions on finances and budget. Decision agreements such as continuation of a research project approved by the IAB.
Predictable	Tasks for interactions with industry.
Repetitive	Preparations for IAB meeting.
Deadlines	Responding to requests from member companies to solve technical problems.
Mundane	Maintenance of lab equipment.

of gaps "between the shared values people hold and the reality of their lives, or of a conflict among people in a community over values or strategy" (p. 254). Adaptive problems require learning, both to define the problem and to develop and implement a solution. Heifetz argues that, because adaptive problems are complex and involve multiple sets of values, leaders must involve their followers in defining and solving them.

This perspective is particularly useful for looking at the work of an organization most centrally defined as a boundary-spanning unit. The hybrid structure of I/UCRCs involves multiple stakeholders/constituents with different values and priorities. For example, university researchers typically value freedom to choose their own research directions, creation of basic knowledge, and freedom to disseminate knowledge as dictated by the academy. Industry, on the other hand, values the potential competitive edge gained by entering an I/UCRC. Industry often hopes to actualize this by controlling research topics and the dissemination of results (Fairweather, 1991). These conflicting values are present within the context of the I/UCRC. Subtly, or not so subtly, Center Directors must exercise leadership if these contradictions are to be resolved to achieve a synthesis and direction.

Typically, such situations require input from individuals with diverse expertise and perspectives. Further, because individuals are more likely to implement plans in which they have had a voice, the leader can strengthen commitment to the center by involving other members in strategic decisions. In I/UCRCs, commitment to goals and the strategy of the center are essential because such commitment is more likely to engender a willingness on the part of other faculty to share the leadership responsibilities of the center. Figure 10-2 provides a list of some situations within an I/UCRC requiring participative, enabling leadership. Notice that these situations have far-reaching consequences often requiring consent and participation from center faculty and industrial members.

This does not mean that the Center Director is a facilitator but rather an advocate to constituents. The Center Director advocates development of a shared vision of the center's future. The I/UCRC director is often the first to articulate such a vision, but if it does not capture the imagination and support of members and constituents, the center is not likely to grow. Authority over I/UCRC constituents is limited so the Center Director must rely on interpersonal skills to accomplish this.

Figure 10-2	Participatory leadership situations.

Situations	
Complex	Development of the research agenda.
Beneficial	Transfer of outcomes from the center's research program to industry.
Unpredictable	Termination of program or project due to unfavorable review by industry.
Unique	Discussion on foreign company becoming member.
Long-term	Cooperative agreements with another center.
Critical	Marketing the center to prospective members.

Summary

The previous perspectives on leadership inform our thinking about I/UCRC leadership because they suggest that: (1) understanding the need for intelligence, leaders are made, not born; (2) Center Directors must deal with internal and external constituents with whom they have differing degrees of influence; (3) Center Directors must distinguish situations in terms of their call for participative, enabling leadership behaviors vs. directive, administrative management type behaviors; and (4) Center Directors must use interpersonal influence to help their constituents meet adaptive challenges.

While these responsibilities are challenging, Heifetz (1994) provides a metaphor that is useful for thinking about some of the roles the leader must play. He suggests that the leader must be able to "get on the balcony," to alternate between participating and observing. Thus, to help the leader think about how to move the enterprise forward, he or she must step back to try to understand what it is that concerns constituents or causes them to be in conflict.

What aspects of managing a center are likely to represent adaptive challenges? While there are certainly many, we have identified six broad concerns that constitute adaptive challenges for a center: creating a new enterprise, technical vision, boundary spanning,

team culture, developmental needs of a changing organization, and knowing oneself.

ACTING AS AN INTRAPRENEUR

The initiation of a cooperative research organization requires some of the more difficult aspects of leader behavior. The leader will undertake a bundle of actions which together constitute one of the hardest tasks imaginable—starting an enterprise from scratch. Such a task requires thinking and acting as both an entrepreneur and an intrapreneur. As defined by Webster, an entrepreneur is "a person who organizes and manages a business undertaking, assuming the risk for the sake of the profit." Although a cooperative research center is not strictly a business, the definition holds for what is expected of a center leader.

For one, clearly there is risk. There is a relatively high failure rate of organizations such as cooperative research centers. For every successful cooperative center launched, there is one center which failed in the stages of planning or early implementation. In addition to the large risk of organizational failure, there are many mini-risks along the way including lost opportunities, conflicts with administrators, collegial jealousies, and the cashing-in of valuable "IOUs" with industrial contacts. In order to build the center, the leader will need to be experimenting constantly in organizational relationships, personnel strategies, technical direction, and growth strategies. Most of these experiments will be initiated on the basis of minimal or zero information. There is much seat-of-the-pants risk taking involved in center leadership.

While university researchers seldom speak of "profit," the successful cooperative research center can yield much in the way of profit (defined as resource aggrandizement). Profit in a center includes the leveraging of the corporate members' research funds in the center, and the use of their own research funds. In the first instance, member companies profit by benefitting from research that is funded by their own contributions multiplied by the number of member companies. In the second instance, member companies profit by "outsourcing" their research activities to the cooperative center, while they receive high quality research at very little expense (relative to the cost of their in-house research). Faculty profit by increasing their research support and expanding their intellectual horizons. Further, there have been other individual rewards attached to success as the creator of a center. Faculty who take a turn at center leadership often end up becoming university

deans. They also tend to function as a magnet for other funds and opportunities.

Yet a Center Director's situation is very different from the commercial entrepreneur. The Center Director confronts a more limited environment, with fewer options and more constraints (e.g., framed by a government sponsor, university, and industry rules and expectations). In fact, Center Directors' positions are similar to those of corporate intrapreneurs, or the entrepreneurs that operate within the constraints of a structured organization. Typically, intrapreneurship is "a process by which large organizations use their own members to originate and implement new ventures and products . . . to ensure institutional strength" (Perlman, et al., 1988). As an example of academic intrapreneurship, Perlman, et al. described an intrapreneurial process that was used to revitalize the University of Wisconsin at Oshkosh. In this process, a new Chancellor took bold action by proposing and championing radical scheduling and funding changes that better met the needs of the student body as well as those of the faculty. But, while he took decisive action, he involved faculty in developing support for the change that would fundamentally change their working lives. Much as proposed by Heifetz, he involved them in addressing the gap between reality and their values.

While corporate intrapreneurs often found their own company as they differentiate their activities, the leader-founder-intrapreneur in the university has the outlet of forming a separate institutional entity—the Center. Although the center has limited autonomy, it gives the university intrapreneur an outlet for some of the energy of creation that is characteristic of entrepreneurs.

While we have downplayed the idea of natural born leaders, there is a great deal of evidence that successful entrepreneurs tend to share a certain number of behavioral dispositions. Specifically, Perlman, et al. (1988) note that intrapreneurs are:

1. *Risk takers*: intrapreneurs seem more likely to take risks, albeit calculated and well-defined. They are "dreamers who do . . . [who] figure out how to turn an idea into a profitable reality (p.18)." Similarly, Bennis (1993) explained that leaders have the "ability to accept risk . . . . [they have the] capacity to make as many mistakes as . . . soon as possible and thus get them out of the way." Mistakes are seen as something to learn from and use; not as failure, but as the next step.

2. *Autonomous:* intrapreneurs often have personal needs such as autonomy, responsibility, and ownership which are met by developing a new innovation within an organization.

3. *Are focused on change and opportunity:* intrapreneurs ask questions such as "How can we capitalize on opportunity?" "What resources are needed for this effort?" "How is control gained over these resources?" rather than questions related to maintaining stability.

4. *Undertakers of difficult and complicated tasks.* As such, they are highly motivated people who have a specific goal that they pursue tenaciously.

Beyond any doubt, creating a new industry-university center is an intrapreneurial act that will require all of these traits. However, the need for intrapreneurial leadership doesn't stop once a center is created. Center Directors must be searching constantly for opportunities for a fit between center researchers and companies. This requires effectively spanning a number of boundaries. Here's a fictionalized example of a Center Director with this orientation:

> *Bob Rush is the director of a large I/UCRC. He was the catalyst for a newsletter which is distributed to several hundred individuals and firms which is considered the major forum for work in his center's area. He has also spent a great deal of time serving as an officer on various associations as well as networking with and getting known by all the movers and shakers in the industry his center serves. This has allowed him to be very effective in recruiting new members (most decisions coming from the top down, which is the opposite of most centers). It has led also to the creation of an international linkage with a foreign institute.*

DEVELOPING A TECHNICAL VISION

Developing or working with constituents to develop a vision is one of the key tasks of leadership (Bennis, 1993, Conger, 1991, Farris, 1988, Heifetz, 1994). Visions are statements of ideal future states based upon the most compelling ideas of what members want the organization to become. They are tools to "manage meaning" (Bennis, 1993). I/UCRCs that succeed are guided by a formal or informal vision. In some instances, the vision and the accompanying research plan result from a formal strategic planning process involving different center stakeholders. In other cases vision arises

from one or two core leaders. They create a vision and an implicit mission for the emerging enterprise. This is a significant activity of early-stage I/UCRC leadership.

There can be organizational components of a vision: the center as an efficient entity in which the administration and the research functions are complementary and both work towards the goal of a prime research center; or how the center will work with the university, member companies, other universities, and international groups and institutions.

A compelling vision attracts companies, faculty, and other resources to any center. The language of the vision plays a critical role in its acceptance and accomplishment. Compelling visions are a result of the strategic expertise and knowledge of the leader(s). They are framed around appealing goals that have positive, culturally important meanings for the organization (Conger, 1991). Because centers span between institutions, their vision must incorporate both university and industry. See Chapter 5.

The technical vision of a center will need to be revisited continually and sometimes completely revamped as the center matures. For example, directors have exercised leadership by recognizing that a center's research vision was past its prime and acted as catalyst and facilitator of a process which provided a new and revitalized vision. Here's a fictionalized example.

> Helen Scholar, director of an I/UCRC that performed work for the computer industry, spent her sabbatical at a major federal agency where she reviewed proposals and met with other scientists. She realized there that increasing computer speed and capacity would limit severely interest in the kinds of problems which currently defined her center but that this center had the capabilities to have a major impact on another industrial need. Upon her return, she articulated her new vision for the center. The center changed its focus and name and began addressing a broader class of design issues resulting in a resurgence in membership, revitalization and financial success.

SPANNING MULTIPLE BOUNDARIES

The importance of effectively spanning boundaries while developing and managing a cooperative research center cannot be overstated. By boundary-spanning, we mean attention to groups outside the core in the center. In I/UCRCs, failure to attend diligently to a center's boundaries, particularly as defined by current and prospective members, can be catastrophic to health and longevity.

Research on boundary-spanning suggests that two types of activities are particularly crucial in developing innovative research groups or teams (Ancona and Caldwell, 1992). Ambassadorial activities are those designed to persuade others to support and provide resources for the team. Task coordination activities are those interactions with external groups to coordinate technical or design issues. It is important to clarify that it is not necessary for the center leader to perform both ambassadorial and task coordinator activities alone, but to ascertain that the activities are being accomplished by someone in the center. In fact, Ancona and Caldwell (1992) found it important for all members of the team to perform these activities.

Because the task of recruiting new companies to the center is ever present, it is important for the leader to get all participants to use every opportunity possible and every network available to serve as center ambassadors to potential new members. Individuals network differently. The more center members that participate in these activities, the more successful the center will be in identifying and recruiting new members.

In regard to member companies, PIs are probably in the best position to handle task coordination activities with bench-level scientists, but Center Directors are best to network center IAB members. IAB members are gates to a much more complex set of players and stakeholders back in the company. Effective center leaders will open these gates, and develop a much more useful — albeit complex—communication network in industry. They will spend much time reinforcing and developing this network of communication and, when possible, will influence the industrial members in various ways including their choice of appropriate IAB members. As well, the leader and key faculty may step into the company to become a "virtual" member of their internal teams.

Creating effective relationships with industrial constituents will not happen as a result of sending reports and memoranda to IAB members. The most effective center leaders allot time *every week* to visit the plants and labs of member companies. This never ends, and some centers have developed a shared leadership structure in which one of the co-leaders takes on this responsibility. In other centers, Center Directors develop incentives for faculty who recruit member companies.

Networking is also an excellent opportunity to model appropriate behavior to younger faculty and graduate students and thus increase their leadership competencies. Center leadership must adopt interaction which is open, responsive, and peer-to-peer. To

increase boundary spanning capacity, center leaders should involve junior faculty and graduate students in these interactions.

In regard to the home university, a critical leadership and boundary management task is obtaining support and resources from other university administrators. The demands of this task depend upon the rank of the university administrator. For example, the Center Director must educate top university administration about the vision and purpose of the center and how it fits with the university's mission, the role and visibility of the center in the university's present and future, and the importance of university resources to the center. University administrators can also provide the center contacts with powerful others who might join or support the center by providing endowments and support for cross-disciplinary efforts.

The Center Director must also span boundaries between universities. As centers expand it is likely that all the technical expertise needed to meet the center's mission and the needs of the constituent companies will not reside in its university. Center Directors must identify and recruit faculty or create partnerships with other universities including multi-site centers (see Chapter 11). Here's a fictionalized description of a director whose actions embodied this principle.

> I/UCRC Center Director, Joseph Bridger, realized very early that his own university did not possess the breadth of technical expertise desired by his industrial members. This never threatened the success of his center in spite of strong opposition from local administrators who objected to sending support off-campus. Bridger was able to pinpoint unmet needs and subsequently identify and recruit talented faculty at other universities who could fill these gaps. Ultimately, one of these linkages resulted in a multi-university partnership which helped to strengthen the center technically and resulted in the addition of new members.

In summary, boundary-spanning activities are the lifeblood of a center. It is essential to recruitment and retention of members and to effective technology transfer. Center leadership must convey this in both word and deed throughout a center's whole lifecycle.

CREATING THE CENTER RESEARCH TEAM

Within the university, Center Directors have a unique role because they lead groups of their intellectual and organizational

peers. Most frequently, they have no formal authority over these individuals and the persons they lead are often leading scientists and engineers who, in their own right, are typically characterized by their expertise, desire for autonomy, commitment to their work, and identification with their profession rather than their organization (Kerr, et al., 1977; McCall, 1981). These characteristics of scientists and engineers have implications for recruitment and for working with faculty colleagues in an I/UCRC.

Typically, a center's growth depends on a small number of core researchers whose competencies constitute the technical vision. Directors can enhance a center's success by developing a vision that appeals to two or three major stars whose competencies complement their own.

How a Center Director works with faculty peers is crucial. McCall (1981) found that more productive research groups had supervisors or leaders who, rather than exercising authority, fostered scientific productivity by recognizing good ideas, defining significant problems, influencing through expertise rather than authority, and providing technical stimulation. Similarly, Farris (1988) noted that the most effective R & D leaders were technical experts who provide effective critical evaluation of others' ideas. Experience suggests the Center Director can share the role with those unwilling to take on administrative roles, but willing to nurture other scientists. If the Center Director is not a technical expert, Farris's work suggests that the director should provide a climate of freedom for center members to develop and pursue their ideas.

McCall's (1981) and Farris's (1988) findings that successful influence is based on expertise rather than authority should comfort Center Directors who have expertise but, in most cases, have very little authority over their peers. Thus, Center Director-leaders must fine-tune their informal influence skills. In this vein, Cohen and Bradford (1991) argue that honesty and trust is imperative. Beyond being absolutely honest and straightforward so that trust is built and maintained, they suggest that effective informal influence is based on an exchange of needs and resources. Among the "currencies" that a Center Director-leader can offer center faculty are:

- vision (i.e., being involved in a task that has larger significance for the unit; organization, customers, or society)

- excellence (i.e., having a chance to do important things really well)

- new resources (i.e., obtaining money, budget increases, etc.)

- challenge/learning (i.e., doing projects that increase skills and abilities)

- recognition (i.e, acknowledgment of effort, accomplishment, or abilities)

- visibility (i.e., the chance to be known by significant others in the organization or profession)

- reputation (i.e, being seen as competent and committed)

- contacts (i.e., opportunities for linking with others) (Cohen and Bradford, p. 79).

In addition to being able to motivate others to accomplish the tasks of the organization, the group dynamics literature has argued that leaders need to address the social and emotional issues of the organization. In a cooperative research center, one of the most important social-emotional responsibilities of the leader is to create a team culture. But why should the Center Director want to create a team culture? Why not go along with the individualistic way that most university researchers operate?

There are several reasons why a team culture is important in an I/UCRC. For one, the very concept of a center implies a group process and product, not just an amalgamation of faculty. Moreover, the attractiveness of the product to companies derives from the assumption that complementary expertise is being pulled together. This, in turn, implies teams and teaming, at the level of both the project team and the overall center.

Teams need to be integrated into center operations along disciplines, research expertise and methodologies. Cooperative research in industrial settings is increasingly organized around multi-organizational teams representing different stakeholders during the technology life cycle. A project team may include people from different units or departments, different organizations, and different sectors. In terms of life cycle it might also include basic researchers, end-users, commercializers, and business-marketing interests. Center leaders need to assemble and hold together increasingly heterogeneous teams. This can be at odds with the prevailing norms and practices of the university.

Center projects should be examples for teams in action. A written center statement of the importance of teamwork can serve as a powerful reminder to center participants. The center must create powerful incentives for teams. If a center gives lip-service to the

values of cooperation and then funds a series of egocentrically conceived and executed projects, teams are pointless.

Providing incentives for teams demands action by Center Directors. Insist faculty conduct peer review of research projects. Make teams and the use of co-principal investigators a project selection criterion. Share any praise with all members of the team. Hold monthly meetings of the center team. Develop follow-up action items for teams. Assign one researcher to train another. Host informal social events once or twice a semester. Some of the more productive and creative high technology companies have intentionally organized Friday afternoon social activities. However, all of these practices will be for naught if institutional policies discourage or fail to reward multi-investigator projects and joint publications and, by implication, teaming and collaboration. As a consequence, a leader must be prepared to point out these inconsistencies and, if necessary, challenge them.

LEADERSHIP AS THE I/UCRC DEVELOPS

Many things can be understood from a life cycle or developmental perspective. That is, we can conceptualize the birth, development, maturation, and decline of entities as diverse as flatworms and specific technologies (e.g., computer operating systems). In a cooperative research center, some things change and some don't. We have argued that the leader of a new center will need to:

- Develop a center vision
- Think as an intrapreneur who develops a new organizational entity within the university
- Span boundaries between the institutions involved in a center
- Develop and support multi disciplinary research teams.

While these tasks may not have the same urgency as the center matures, they will continue to be critical for the success of the center. One of the major leadership challenges is rejuvenating a stagnant or ossified R & D agenda by wiping the slate clean of the technical vision and strategic planning that was launched several years earlier. New industrial members may trigger a need to rethink the research agenda.

On the other hand, some of the Center Director's work does change over time. Three major tasks include routinization of pro-

cedures, developing leadership capabilities in others, and preparing for succession.

Routinization of Center Operations

Some of the center procedures and processes that can be routinized include:

- Staff meetings, distribution of minutes, and action items
- Process for reviewing and managing the research program, and for working with industrial clients
- Manuals describing procedures, forms, and other administrative tools.

These tools are described in various chapters throughout this volume and can, in many cases, be put in place by a center manager who is not the same person as the Center Director. Differentiating those responsibilities to be carried out by a manager and those to be addressed by the center director-leader is not a shortcoming of the director but rather an action that allows individuals to excel at what they do best. The point to be made here is that the leader must support the development and implementation of an appropriate set of stable bureaucratic procedures.

Shared Leadership

Throughout this chapter we have mentioned areas where leadership responsibilities are best shared, including recruiting industry firms, nurturing relationships with IAB members, and routinizing the structure of the center. Giving other faculty moderate administrative and leadership duties is one of the most effective ways to develop their managerial potential (Cordero and Farris, 1992). Leadership and managerial competencies within other center faculty will become increasingly important as the work of the center expands. Thus one of the most important jobs of the center director-leader is to nurture leadership competencies within other center constituents, including other faculty.

Succession

In the history of every cooperative center there comes a time for succession. A study of I/UCRCs showed that the Center directorships last, on average, only three years (Gray et al., 1991).

The director leaves for a promotion or new position, returns to full-time laboratory research, or launches some new venture in another setting. Succession may signal a point of financial and intellectual stability that permits a different type of leadership. However, if the leader has not prepared the center for succession, it can mean a time of great turmoil and instability. In the study cited above, over half the firms interviewed said the turnover of directors had been very disruptive. The fictionalized description illustrates what can happen.

> *Dr. Edward Mobile was considered one of the top scientists in automation. The I/UCRC he directed was one of the most successful in the country. He was solely responsible for every aspect of center administration. Over the years Mobile received and turned down a variety of lucrative offers to join industry. For a variety of personal and professional reasons he decided to accept an attractive offer. Mobile gave the university six months' notice and left succession to the university. The university did not mount a national search and appointed a relatively inexperienced colleague as director. In the opinion of most members, the center lost its technical vision and ability to communicate effectively with industry after this transition. Two years later, it lost almost two-thirds of its members and eventually terminated operations.*

Center Directors may wish to groom a deputy director or an acting director in conjunction with a sabbatical, or reassigning the director's responsibilities to a deputy director. I/UCRC directors should detail viable plans for their succession. The plan should list I/UCRC activities and responsibilities and a commitment from the university's administration for an outside search. Center Directors must promise their successors a debriefing on the center's vision, problems, and a history of what did or didn't work, and any unique characteristics of the center. This can be in writing, audio or videotape recording. Finally, the Center Director should bring stakeholders into the succession process by eliciting their participation.

The process of succession must be managed by senior researchers, corporate members, or university administration. There is some evidence that an external candidate will be more likely to shake things up, and if that is what is desired in a transition, then an outside candidate should be sought. In a mature and stable center the best choice is a researcher already attached to the center who has shown some leadership inclination and talent.

THE IMPORTANCE OF SELF-KNOWLEDGE

It is clear that the Center Director role and tasks require more than many researchers feel capable of handling. But a director can share leadership with others in the center. This suggests the most important leadership quality is knowing oneself. Indeed, Bennis (1993) has argued that effective leaders know themselves and their skills and deploy them effectively. They also know their weaknesses.

For example, a Center Director might enjoy teaching and research but feel uncomfortable with an administrative role. S/he might feel quite comfortable working within the university but dislike making the necessary contacts with member companies. A director might be stimulated by and enjoy the headiness of a start-up period but be bored by developing the more routine aspects of a center's operation. An examination of one's preferences may reveal that it's time to move on.

For the center to be successful, it is also critical that the leader adapt to the challenges the center faces at any particular time. This may mean spending more time amplifying and fine-tuning the center's bureaucracy or, as we've discussed above, moving toward a shared or collective leadership approach. Exercising these options presumes the Center Director knows which challenges s/he is willing to tackle and which s/he is not.

Consistent with the notion of shared leadership is a rotation schedule in which successive researchers serve as Center Directors for three- to five-year periods each. This allows the senior research personnel in the center the opportunity to lead the center. The founder emeritus leader is still very important. If succession is graceful, the emeritus leader resumes a defined technical role in the center and eases transition of the incoming director. A bitter director emeritus hampers growth of the center. Handle this carefully; give credit and acknowledgment, and carefully move on. Rotating at the associate director level is another option. Compare this fictionalized example with the preceding.

> *Manny Lecture was the lead faculty member involved in the creation of a new I/UCRC. Shortly after the center was created, he announced that he had done some soul searching about his role. He had received too much satisfaction from teaching and doing his research and too little from administration to justify continuing in the role of Center Director. He gave the IAB and the university notice to find a new director but agreed to serve out the year. This allowed plenty of lead time for the transition and resulted in the hiring of a very effective director.*

On a more negative note, succession may be forced by "burnout" and declining performance by the founding director. This happens more often than academic administrators are willing to admit. Close attention should be paid to inattention to administrative detail, difficulty in relating to and retaining corporate members, and difficulty in forging and enlarging the technical vision of the center.

There are several ways to avoid burnout. First, the director may opt to reduce his range of responsibilities through delegation or the appointment of a deputy director. Second, the director may devote more time to research and teaching. Third, the director may take a sabbatical for one semester or longer. Once again, as this fictionalized description illustrates, knowing oneself can be the key to a positive outcome.

> *In a center with close to 20 industrial members, nearing its sixth year of operation, the founder-director felt besieged by the demands of routine center tasks. After consultations with colleagues and the center evaluator, he decided to allocate a good portion of his routine responsibilities to a colleague, who assumed the position of an operations manager. This manager was responsible for the routine operation and the maintenance of the center, including resources allocation, conflict resolution and periodic control and review of activities. Complete responsibility for marketing and maintaining links with industry remained with the founding director. Thereafter, the center operations ran smoothly and membership increased.*

SUMMARY

When leadership works, improvement is the effect (Bennis, 1992). Effective leaders make a difference in a variety of ways: people feel they make a difference to the success of the organization, that risk is part of life and mistakes are sources of feedback to tell us what to do next, feel part of a community, and feel work is exciting. The Center Director-leader is in a unique position to foster such empowerment, community, excitement, and connection within the university. The Center Director helps constituents learn and develop. The Center Director is rewarded by feelings of accomplishment in building an organization, success and growth, and knowing s/he brought together technical expertise to everyone's benefit.

ANNOTATED BIBLIOGRAPHY

Bennis, W. *An Invented Life: Reflections on Leadership and Change.* New York: Addison Wesley, 1993.

In this collection of essays, Warren Bennis, Distinguished Professor of Business Administration at the University of Southern California, reflects on three decades of experience as an university leader and leadership researcher. In this book, he emphasizes the importance of self-reflection, a tool which enabled him to conclude while president of the University of Cincinnati that leadership was about the relationship between the leader-as-individual and the organization. In addition, he reports on the findings of an extensive study of nearly 100 chief executives of corporations, heads of foundations, or heads of major government departments or agencies. In this study, Bennis and Nanus (1985) found that effective leaders are able to focus on a vision, communicate that vision to others, establish trust by being reliable and consistent, and have both a positive self-regard and a positive regard for others.

Cohen, A.R., and Bradford, D.L. *Influence Without Authority.* New York: John Wiley & Sons, Inc., 1991.

The central premise of this helpful book is that individuals in today's workplace are often not given the authority to accomplish the work they need to get done. As a result, they must fine-tune their influence skills. According to Cohen and Bradford, informal influence is built upon the principle of reciprocity. To exert informal influence, individuals must assume that the "other," or influence target, is an ally, clarify their own goals and priorities, diagnose the ally's world (goals, concerns, needs), assess their own resources relative to the ally's wants, diagnose their relationship with the ally, determine the exchange approach, and make exchanges.

Farris, G.F. Technical Leadership: Much Discussed But Little Understood. *Research-Technology Management*, 31, 1988, pp. 12-16.

In this article, George Farris, a leading researcher on R & D leadership summarizes what is known about technical leadership. He concludes that the effective technical leaders are strategic leaders, effective organizational players, technical experts, informal leaders, developers of personnel, creators of climates that stimulate technological thinking, and are responsive to their followers.

Heifetz, R.A. *Leadership Without Easy Answers*. Cambridge, MA: Harvard University Press, 1994.

Heifetz's definition of a leader is "someone who mobilizes constituents to learn to solve their adaptive problems." In example after example of

"messy problems," or those problems that are not amenable to technological quick fixes (e.g., Civil Rights in the South, the enforcement of environmental regulations when jobs are at stake), Heifetz carefully explicates the process that leaders (e.g., Martin Luther King, Jr., Lyndon B. Johnson, William Ruckelshaus) use to help their constituents develop their own solutions to problems. This book is a refreshing antidote for those leaders who, from their own experience, know that leadership is more difficult than the experts say.

McCall, Jr., M.W. *Leadership and the Professional*. Technical report no. 17. Greensboro, NC: Center for Creative Leadership, 1981.

This report summarizes research on leadership and the professional by addressing four topics, including (1) who is being led and how professionals are different from other "followers;" (2) what the leader can do to enhance productivity among professional subordinates; (3) the impact of the professional on the organization; and (4) the choice faced by a professional in becoming a "manager." In particular, this report is useful for thinking about leading one's intellectual and technical peers, a task that many Center Directors face when leading other faculty.

Perlman, B., Gueths, J, and Weber, D.A. *The Academic Intrapreneur: Strategy, Innovation, and Management in Higher Education*. New York: Praeger, 1988.

Perlman, Gueths, and Weber describe the intrapreneurship process that was used to revitalize University of Wisconsin-Oshkosh. The book gives a model of the intrapreneurship process, rich description of the journey undertaken, and concluding thoughts on what did and did not work.

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