Engineering Technology Departmental Leadership

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Abstract
This paper discusses important aspects of leadership as applicable for engineering technology educational unit leaders and senior faculty. The paper is divided into four primary areas and has been used as the basis for an engineering technology leadership workshop with new leaders or individuals preparing for leadership roles. The content areas are: a) leadership versus management; b) situational leadership for educators; c) motivating people in the academic setting; and, d) leadership when making decisions for the good of the unit. The leadership versus management section provides a brief explanation of, and contrast between, leadership and management. This sets the stage for the second section where situational leadership for educators is addressed. This section includes a discussion of leadership styles and the readiness of the faculty being led. The third section addresses motivating people (both faculty and staff) in the academic setting, including the management of resources as a leadership tool. The fourth section focuses on the role of the unit leader in making difficult decisions for the good of the unit.

Introduction
Unlike the military environment where both enlisted and officer personnel are exposed to structured leadership education, engineering technology administrators and faculty are rarely exposed to similar content. More importantly, the more senior faculty are often thrust into educational leadership positions (department or program administration or roles within a Dean's office) with little or no leadership training or experience. This paper seeks to provide insight to academic unit leadership from an engineering technology point of view, one where as technologists a higher value is placed on practice and tacit knowledge as compared to theoretical knowledge.

However, this paper is not intended to provide a complete review of available academic leadership/management materials or learning opportunities. There are many books published in this general area[1,2,3,4] and the interested reader can find a complete treatment of the subject in them. Some have a long history, for instance Tucker's book[2] has seen multiple editions and was used in developmental workshops presented by the American Council on Education (ACE) during the 1980s. Many organizations, including the ACE, provide support for departmental administrator development. For example, ACE's web site hosts a "Department Chair Online Resource Center."[5]

But professional development opportunities, books or articles for department leaders or senior faculty often seem too focused on management issues (schedules, budgets, etc.) instead of leadership. As an example, a description of the Leaming book as a "collection of 13 essays by

experienced chairs, deans, and vice presidents explores the many different aspects of people management and offers suggestions and resources"[6] uses the words "people management" instead of leadership! Also, a causal inspection of the ACE online resource center indicates that it seems to focus more on management issues than basic leadership.

While management skills are important, leadership skills can be even more important. This is particularly true when the unit is under some sort of stress, either internal or external to the unit. This is not an uncommon setting for many engineering technology units in the present educational environment. Thus, this paper focuses on leadership aspects important for engineering technology department leaders as seen from the vantage point of three experienced technology department chairs.

Leadership

There are multiple definitions of leadership available from the literature. Several common ones are the art of motivating people to accomplish a common purpose or the process of influencing, guiding in direction, course, action or opinion. As indicated in the first definition above, leadership is tied to the concept of motivation, e.g., inspiring people or spurring them to action. In short, leadership is providing a vision and influencing people to translate the vision into reality. Kouzes and Posner[7] point out that "Leaders tap into people's hearts and minds. They get faculty and staff to understand, appreciate, and believe in the noble purposes of their specific organizational unit or department, within the context of the overall college's mission."

Unfortunately, our experience suggests that many educational administrators (new and experienced) confuse leadership and management. A simple but profound way to distinguish between the two is the guidance to "**manage things and lead people**!"[8] As Bennis and Nanusstate also state, "Managers are people who do things right and leaders are people who do the right thing." It should be noted that **both** leadership and management are needed for a good educational enterprise and workplace. While, in general, people want a well-managed place to work (fair and well-organized class schedules, teaching or office supplies provided in a timely way, fair division of resources between people and programs, good advising support and systems, etc.), they want to be led, not managed. Who ever heard of a "world manager" or a "boy scout manager?" So, it is important to manage departmental functions but lead the faculty and staff in the unit.

As a departmental or educational unit leader, it is important to "manage yourself but lead others." To be effective as both a manager, it is necessary to remain focused and organized so that the myriad of tasks facing you can be accomplished in a timely manner. Often as an educational administrator, you will often hear about management problems (how come we never have white board markers?) but may not be told about leadership weaknesses or failures. Thus, unless administrators remind themselves to think about, and work on, unit leadership, it can easily be neglected.

Situational Leadership

As a foundation for educational leadership, the theoretical concept of "situational leadership," using the work of Hersey, Blanchard, and Johnson[9], is introduced. First, a discussion of leadership styles and the types of followers in organizations is discussed. An adaptation of

traditional leadership styles to engineering technology departmental level leadership concludes this section.

Hersey, et al., develop leadership style profiles by capturing the behavior of leaders with respect to their personal involvement with the task at hand and with respect to the relationships they maintain with their followers. The "task behavior" and the "relationship behavior" can be viewed as sliding scales from "high" to "low." Leaders can operate at any point along the task and relationship continua depending upon the task at hand and the readiness of their followers for that task.

To better understand task and relationship behavior, the following examples are offered. High task behavior may be characterized by rolling up ones sleeves and getting directly involved with accomplishing the task at hand, while low task behavior would be quite laissez faire. High relationship behavior would involve frequent two-way interaction with the followers, while low relationship behavior would lend support to the followers when necessary, be highly directive when necessary, and typically involves one-way communications.

Hersey, Blanchard, and Johnson use a four-quadrant square to depict four generalized leadership styles. The quadrants are labeled: "telling," "selling," "participating," and "delegating." Recall that leaders may act on a continuum of either behavioral scale—task or relationship—so, the four quadrants merely simplify the discussion of styles. The following four descriptions are adapted from their book.

- Telling: High Task Behavior and Low Relationship Behavior. The leader is very directive and provides close supervision of the project. Often, communication is one-way from the leader to the followers.
- Selling: High Task Behavior and High Relationship Behavior. The leader may still make the decisions, but will explain them to the followers and give them opportunities to ask for clarification. While "selling," the leader remains heavily engaged in the project, but opens up two-way communications with the followers.
- Participating: Low Task Behavior and High Relationship Behavior. The leader shares ideas with followers, but becomes an active listener. The two-way communications become more follower initiated. The leader becomes less involved with the task at hand, but facilitates decision-making.
- Delegating: Low Task Behavior and Low Relationship Behavior. The leader delegates responsibility and authority to the followers. Communications lean toward one-way from the followers to the leader.

Although leaders may adopt any leadership style, most leaders have a preference—a style from which they would prefer to operate. Very few leaders are so adaptable that they have no preference. Instruments are available from Hersey et al. to help individuals identify their preferred leadership style and the ease with which they can adapt a different style. One such instrument identifies the leader's preferred style from the point of view of the leader. Another assessment tool provides the followers' views of the leader's style. As may be expected, these points of view can be quite different. While the instruments cannot be included in this paper due

to copyright restrictions, it is suggested that each person should research his or her leadership style and use that knowledge to provide more effective leadership in their workplace.

To make use of these leadership styles in an organizational setting, the leader also must understand the readiness of the followers. In Hersey, Blanchard, and Johnson's work, follower readiness also varies continuously on a scale between high and low, which involves two factors. The first of these two factors is the followers' ability to perform a given task. The second involves the followers' *confidence* in their abilities and their willing to perform the task. Similar to the discussion of leadership styles, there are four generalized categories of follower readiness in the authors' *Management of Organizational Behavior.*[9] These are given as:

- R1: Low Ability and Low Willingness or Confidence
- R2: Low Ability and High Willingness or Confidence
- R3: High Ability and Low Willingness or Confidence
- R4: High Ability and High Willingness or Confidence

Followers in the R1 readiness level normally need a "telling" leader who is directly involved with the task, who give clear instructions, and who provides close supervision. Similarly, R2 followers typically require "selling" leaders, R3 followers work best with "participating" leaders, and R4 followers want a "delegating" leader.

Since the leader's task behavior and relationship behavior and the followers' readiness each exist on continuous scales, the presentation of four styles and four readiness levels is somewhat simplistic. The most effective leaders are able to adapt their leadership styles to the situation and the task at hand. Some leaders adapt more readily than others. However, awareness of these leadership styles and follower readiness levels empowers leaders to react to varying leadership environments.

Applying situational leadership to an engineering technology academic department brings its unique challenges. At first glance, faculty would seem to be at the R4 readiness level. Engineering technology faculty typically possess considerable academic knowledge and industrial experience. For the most part, faculty exhibit confidence in their individual ability and knowledge. They have both advanced degrees and most departments hire faculty based on their corresponding success in the industrial workplace.

However, even the most capable, willing, and confident faculty member may exhibit levels of follower readiness other than R4 in many situations. While faculty member X may be expert in control systems and teach the best controls course in the state, that same faculty member may be completely unprepared for performing outcomes-based evaluations in his course to support an upcoming ABET accreditation. Further, it is not uncommon for faculty to be less than willing to perform administrative functions when their research project is about to yield incredible results. Fortunately, engineering technology faculty, probably due to their years in industry, seem to be more willing to uphold their administrative responsibilities than the average engineering faculty member.

To be of use, engineering technology leaders must be able to translate this brief theoretical discussion of situational leadership into action. By understanding your own leadership style preference and by the knowing the styles that may be necessary in different situations, you should be able to begin adapting your preferred style to react to new tasks. Learning to read your faculty's readiness for certain tasks will help you be prepared for any situation.

Motivating Knowledge Workers

What motivates faculty members to revise their courses, improve their teaching skills, publish more articles, write more grants, commit to departmental goals, and be more involved in departmental administration? Although it may be tempting to rely on the adage that "what gets rewarded, gets done," our premise is that leading faculty members is more complicated than "dangling a carrot." Kouzes and Posner[7] point out that "When it comes to excellence [in academia], it's definitely not 'what gets rewarded gets done'; it's 'what is rewarding gets done.'"

Lucas[10] states that department chairs have the responsibility to motivate faculty to (1) enhance productivity, (2) teach effectively, (3) increase scholarship, and (4) increase service. She prefaces this chapter with a description of the three types of power through which chairs can motivate faculty (i.e. position power, personal power, and expert power) and "influence faculty to create a match between achieving departmental goals and attaining individual goals." The collective experiential knowledge of the authors suggests that motivating faculty is much more complex than the use of power to influence change and that insights into faculty motivation can be gained by understanding the nature of the academic work of faculty members, the models for motivating individuals, and the environments under which the creative work of a faculty member can be fostered or destroyed.

Academic Work as Knowledge Work

A consideration of academic work as a type of knowledge work may lead to insights on the role and responsibilities of department chairs as leaders of creative professionals. Corbin[11] describes knowledge workers as:

- Professional specialists with unique expertise that engenders self-confidence (arrogance to some).
- Intolerant of incompetent leaders within their profession.
- Seekers of recognition for innovation and work within their field.
- Tending to believe they know what is best for the customer.
- Not welcoming change, uncertainty is disconcerting.
- Preferring to discover their own solutions.
- Resistant to command and control management.
- Liking to work with competent peers, not for people.

Knowledge creation and sharing are abstract and creative processes that, at times, are ambiguous and, yet, highly technical. Faculty members are expected to push the frontiers of their knowledge and skills into new areas that are unexplored and unstructured. They strive to share their tacit and explicit knowledge and skills with students who may not place the same value on this

knowledge. The creativity and innovation required for success in knowledge creation and sharing is difficult to manage and requires periods of deep concentration, during which it appears the individual is doing nothing and is "unproductive." Before new technologies are introduced to students, faculty must acquire a knowledge base about the technology that allows them to simplify the concepts. A significant investment in time and energy is required before an instructional transaction (whether to students through lectures and activities or peers through publications) occurs. Yet, it is the visible transactions of knowledge creation and sharing that academic leaders tend to focus their motivational efforts on without regard to the true nature of the work required of a faculty member, which is largely invisible.

Motivation for academic performance can be thought of as either intrinsic or extrinsic. Individuals engage in tasks for intrinsic purposes because the tasks are challenging, interesting, rewarding, novel, or "serve a greater good." Intrinsically motivated individuals may derive a sense of fulfillment or self-expression from activities without any thought of incentives. They do the job or accomplish the task for the enjoyment of doing the job or task.

Extrinsically motivated individuals seek to achieve some reward that is beyond the work itself. Typical academic extrinsic motivators include, course releases, additional compensation, travel, increased responsibility, and professional development opportunities. The goal for doing the work is external to the work itself. For example, a professor may choose to teach a new course because of the satisfaction they receive when students learn new concepts (intrinsic motivation) or because they can receive additional compensation for teaching the course (external motivation).

Not all faculty members are motivated for the same reasons. Quite often, there are a variety of reasons, both intrinsic and extrinsic, encouraging a faculty member to act. The academic leader's role is to create an environment where intrinsic motivation occurs; sometimes through the use of extrinsic motivators. Effective academic leaders realize that motivating high quality knowledge creation and sharing requires many strategies for encouraging creativity and innovation while simultaneously not discouraging these activities. Collins,[12] in his national best seller *Good to Great* states:

> Spending time and energy trying to "motivate" people is a waste of effort. The real question is not, "How do we motivate our people?" If you have the right people, they will be self-motivated. The key is to not de-motivate them.

Glen[13] suggests that the goal when motivating knowledge workers is not to elicit specific behaviors but to elicit creativity and innovation. The true nature of a faculty member's work finds its locus in the "difficult to manage" creative processes. Extrinsic motivators may be helpful but are generally insufficient reasons for eliciting high quality creative behavior. In fact, they may actually be counter-productive to the knowledge creation and sharing process. Positive environmental conditions for fostering creativity identified by Glen include:

- Composing project teams with people that possess the appropriate knowledge and skills to contribute to the team's success. Faculty easily detect those who cannot contribute to a solution because of a lack of expertise or motivation.

- Creating a significant and compelling reason for the work or desired behavior. This requires the leader to frame the problem in a significant and relevant context.
- Setting goals, milestones, and deadlines to highlight progress towards the goals and eliminate the sense of never completing a project.
- Establishing a creative atmosphere that frees people from the intrusions of the external world. Allowing faculty to focus on the tasks without distractions from the Dean, Provost, or President is an important function of an academic leader.
- Creating a sense of competition by identifying the "bogeyman" and defining the measurable steps that can be made to "defeat the enemy with ingenuity."
- Providing appropriate resources at the appropriate time. It is the leader's role to determine which resources are necessary and which resources are luxuries and to encourage the individual or team through timely access to these resources.
- Offering free food. Intermittent access to free food has a motivating effect on creative people that can exceed the actual expenses.

Negative environments can destroy a creative environment and, as a result, demotivate faculty. These negative conditions include:

- Leaving faculty out of the decision-making process. Neglecting the desire of faculty members to be involved in making decisions threatens their competence and autonomy and invites questions about the leaders trust and esteem of the faculty.
- Inconsistent management and leadership. Inconsistent behavior by a leader destroys the relationship between the faculty member and the leader. Faculty begin expending energy to monitor the leader's behavior to make sure they are receiving what everyone else is getting.
- Micromanaging and focusing on tasks rather than goals. Faculty consider themselves professionals and, thus, merit the autonomy that is accorded to other professionals. Micromanagement signals mistrust of their knowledge and skills.
- Uninformed evaluation. Most faculty are specialists in their disciplines and question the ability of leaders to adequately assess their performance. It is critical that performance expectations of faculty members be explicitly stated and reviewed. Most academic leaders do not have the same level of knowledge and experience as each faculty member. By clearly negotiating and describing the expected performance faculty are in control of their progress towards the desired behavior.
- Setting artificial and changing deadlines. Changing deadlines diminishes the commitment to accomplish the task. Activity tends to increase as completion dates approach. Constant changes in deadlines signal that the management process is arbitrary and random.
- Lack of organizational support. A leader's or organization's disengagement in the task suggests that the task is unimportant and is nothing more than busy work. Faculty are unlikely to be motivated to participate in this and other activities if they sense that their efforts have little or no value to the organization.

Creating an environment where intrinsic motivation is fostered involves a complex set of leadership skills. It is tempting to treat the items in the motivating and demotivating lists as variables to be manipulated or managed. Faculty motivation is one of the most significant roles of an academic leader and truly distinguishes the differences between management and leadership. Establishing a motivating environment involves the creation of a sustainable relationship between faculty members and academic leaders. Kouzes and Posner[7] state, "Leadership is a relationship between those who aspire to lead and those who chose to follow." Effective leadership depends on the leader's ability to build relationships that motivate people to accomplish individual and shared goals. Effective leadership depends on the leader's ability to build relationships and environments that motivate faculty to accomplish individual and departmental goals. Fullani[14] states, "To do this they must create many mechanisms for people to engage in this new behavior and to learn to value it. Control freaks need not apply: people need elbow room to uncover and sort out best ideas."

Leadership Arenas

First, as a basis for this section, recall the earlier definition of leadership as providing a vision and influencing people to translate the vision into reality. In addition, while there are many aspects of engineering technology unit leadership, an important one is making difficult decisions for the good of the unit. In these situations, the unit leader may have to make tough or unpopular decisions that are critical to the long-term success of the educational enterprise. In this section, a series of situations are proposed that can be thought of as offering leadership opportunities for educational administrators or senior faculty.

Arena number one for educational leadership revolves around faculty personnel decisions. One particularly difficult situation is when the departmental chair/head has to make a tenure recommendation for a faculty member that most faculty in the unit privately admit as being perceived as "borderline." During the probationary tenure-track period, all appropriate processes have been followed correctly (interim reviews indicating while progress is being made, stronger performance is recommended; mentoring has been provided, etc.), so there is no "easy out" on the decision is provided administratively. The faculty member has been a colleague for four to six years and may have even become a personal friend, as many engineering technology units are small. As a leader concerned about the unit's long-term quality and strength (the vision), what should be done? The difficulty or unpleasantness of informing people about the decision does not lessen the responsibility of the leader to do the hard thing for the good of the unit.

A second aspect of faculty personnel decisions is annual evaluations. Unit administrators often play a key role in these evaluation processes. Unfortunately, our experience reveals that the personnel evaluation process is conducted in ways that trivialize the process, or worse, serve to lessen motivation. It is a leadership responsibility to ensure that an annual evaluation process is fair and meaningful, thus having an impact and influencing people towards accomplishment of the unit mission. Too often, faculty evaluations are trivialized if budgets do not allow compensation to be significantly impacted as result of the evaluation. Certainly, having the budget flexibility to directly link evaluations to salary increases the impact. However, if the process is fair and meaningful (i.e., people are told about what they are doing well and not doing well), evaluations can be respected and help the leader move the unit in the desired direction even without significant salary impact. Certainly, non-monetary rewards exist and can be

powerful motivators for faculty (recall that for knowledge workers, compensation may not be the primary motivator).

Engineering technology educational leadership arena number two revolves around TAC of ABET accreditation. As changes in accreditation criteria are implemented, continual assessment and improvement activities are required for successful program accreditation. Preparation for accreditation is a long-term team effort, requiring the participation of program faculty—many of whom are not experienced with the new requirements. Faculty are consumed with their daily teaching demands and other responsibilities. Therefore, they may not be receptive to assuming the additional responsibilities inherent in the TC2K accreditation criteria. Motivating faculty to embrace the new processes and approaches required for TC2K accreditation is an area of leadership where senior faculty are equally as important as departmental administrators.

Engineering technology educational leadership arena number three involves the creation of an environment for increased faculty research activity within an engineering technology educational setting environment. Many institutions are putting pressure on engineering technology units to generate external revenue streams through funded research. In some cases, the units respond by hiring faculty with doctoral degrees and research experience in lieu of industry experience. Recent modifications in the TC2K criterion on engineering technology faculty qualifications support institutions that are forcing these changes on ET programs. In this environment, the engineering technology leader must retain an engineering technology flavor and resisting morphing into an engineering program.

Conclusion

Engineering technology unit leaders face dual challenges—managing and leading faculty and staff. It is important that leaders remember that there are differences between managing and leading, i.e., manage things and lead people, and that both are important. As with most endeavors, knowledge increases the chances of success. Thus, it is useful for engineering technology leaders to be aware of situational leadership theory and its applications to the educational setting. Also, it is helpful to recognize that engineering technology faculty have characteristics similar to other "knowledge workers" and how these characteristics influence the leadership process. Finally, making difficult decisions and helping the educational unit adapt to changing circumstances in a timely manner fall to the engineering technology leader. Leaders make a difference in the life of an educational program and they are always needed.

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