WHEN DOES LEADERSHIP BECOME ENGINEERING LEADERSHIP?

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Abstract – *The increasing complexity of our world as a result of globalization has called for a greater emphasis on leadership in many sectors of society. This includes engineering, both in terms of education and practice. A review of literature reveals that engineering concepts of leadership do not always align with concepts of other disciplines, suggesting the existence of a kind of “engineering leadership”.*

To identify what this form of leadership might be, four concepts, closely related to leadership are extracted from the leadership literature: problem, skills, authority and values. As these are carried over from engineering to leadership, a certain kind of leadership results.

Of these four concepts, “values” was explored further through the engineering values of dependency, efficiency and inevitability. These values affect one’s concept of leadership: inevitability, for instance, may cause some leaders to uncritically accept certain aspects of the social system. In this way, we can define “engineering leadership” as leadership which embodies or expresses engineering values.

Keywords: engineering education, leadership, values, skills, dependency

1. INTRODUCTION

Engineering leadership has become an increasingly important component of engineering. The need for leadership appears to be the result of increasing globalization and the associated problems becoming ever more complex [8]. Presumably, technology will form at least part of the solutions to these complex problems; hence, the need for engineering leadership. And there appears to be a consensus that, among those recognized as “leaders”, too few are engineers.

Despite the call for more engineer-leaders, it is not completely clear why more are needed or why engineers need to be more “leaderly”. Perhaps the solutions to these complex, globalization-related problems will necessarily involve technology, and engineers in positions of leadership would see to it that these technologies are “properly” implemented. Or perhaps the proposed

solutions are believed to have too little technology and engineering leaders would increase the proportion. Perhaps it’s not a lack of technology, but rather a scarcity of engineering logic and mindset within the decision-making process. Or maybe it’s not the proportion of technology in solutions but rather that proportion of engineers in leadership position; engineers are generally underrepresented within leadership and this current drive merely seeks to “even the playing field”, as it were.

The call for engineering leadership is also heard within the halls of academe. In response to this call, the Faculty of Applied Science at the University of British Columbia has, since 2011, offered a fourth-year course, APSC 461, Global Engineering Leadership. The seminar-styled course presents material through lectures, guest speakers, group discussion, a series of readings and community-based projects (refer to [4] and [15] for further details). The basic conceptual framework of the course is constructed around the four “pillars” of leadership, ethical community engagement, participatory planning and understanding differences. These pillars were developed over a number of years and reflect a belief in a particular kind of leadership suitable for engineers. It is quite evident, however, that none of these four pillars is a normal topic of discussion within traditional engineering programs. One might therefore argue that these pillars were ill chosen, in which case a new framework needs to be developed which better aligns with the existing engineering world. The resulting leadership might be termed “engineering leadership”. On the other hand, perhaps the pillars are legitimate and the transition from engineering to leadership may more problematic than what was originally believed. “Engineering leadership” in this case might refer to the pedagogical approach used to bring engineering students through this transition.

2. OBJECTIVE

The objective of this study is to explore the term “engineering leadership” and thereby come to a greater understanding of what a course in leadership for engineering students might be, in terms of both content and process. Within this aspiration is embedded the idea

that, although engineers and engineering students may have pre-existing, engineering-based concepts that provide a favourable stepping stone to “good” leadership, there may also be engineering-based values and beliefs unhelpful to the cause. It is hoped that by exploring the “unhelpful” some insights into engineering leadership education might be gained that may be overlooked by focusing on the positive.

3. METHOD

The method for this study consists of reviewing various texts discussing leadership, from both engineering and non-engineering sources. These literary sources are supplemented with more informal sources, namely, through views expressed in classroom discussions and student submissions in APSC 461. The perspectives offered are then compared to determine if there are any differences between engineering and non-engineering views of leadership in terms of assumptions, definitions and concepts.

For those differences found, these are further explored to determine if they can be accounted for with reference to some commonly held engineering views which are easily recognizable in non-leadership, engineering contexts. In this way, it becomes possible to show how “engineering leadership” might distinguish itself from other forms of leadership.

4. DEFINITIONS OF LEADERSHIP

An understanding of “engineering leadership” first requires an understanding of the term “leadership” itself. The perspectives and definitions of leadership are many and, not surprisingly, Heifert, speaks of “confusion” [5]. “Confusion” here will be viewed as an opportunity to explore intriguing possibilities that leadership has to offer.

Within engineering, there does not appear to be any single definition of “leadership”, although there is a shift from the individual to more collaborative kind of leadership. Leadership can be seen as a process, involving influence, occurring in groups and involving common goals [7]. Leadership can be identified by a number of capabilities, such as assessing risk, taking initiative, making decisions and a sense of urgency. Leadership is also concerned with trust and loyalty and is connected with multidisciplinary [8]. Leaders exhibit skills such as conflict resolution, and are motivational and inspirational [2]. Some speak extensively of “leadership skills”, but at times these skills are rather loosely defined. In a survey, for example, students assess their own “leadership skills” by rating their ability to, for example, “Develop a plan to accomplish a group or organization’s goals”; the remaining 5 ratings are related to helping sort ideas, taking responsibility, motivating people, identifying strengths and weaknesses, and monitoring the design process [7]. Additional capabilities labelled as skills

include systems thinking, creating a vision, problem-solving, communication, teamwork, and interpersonal interaction [1].

Definitions of leaders can be based on comparisons to managers. For example, leaders are agents of change, managers are administrators; leaders are visionary, flexible, courageous and draw their power from their personal traits, whereas managers are rational, persistent, problem-solving and draw their power from their position and authority; leaders are strategists, while managers are tacticians [8].

Destructive leadership looks at those recognized as leaders whose behaviour has negative effects on the leaders themselves, their subordinates or their organizations [11]. Bullying, abusive supervision and toxic leadership can all be considered forms of destructive leadership. Destructive leadership can lead to human resource loss (such as high turn-over rates), produce a bad organizational culture (such as lack of trust) and reduced performance.

Servant leadership seeks to counter the more traditional style of leadership that is autocratic and hierarchical, where workers become cogs in a wheel [13]. Based on the ideas originally developed by Robert Greenleaf, there are ten characteristics which identify a servant-leader: listening, empathy, healing, awareness, persuasion, conceptualization, foresight, stewardship, commitment to growth of community and building community.

This small sampling highlights the vast array of concepts associated with leadership. Many of these concepts have unspoken or implicit assumptions about leadership, such as the use of the term “subordinate”. Some concepts, upon deeper investigation, may exhibit contradictions not immediately evident. It should be noted here that, of all the concepts of leadership presented, servant leadership was chosen as the basis for the early development of APSC 461. Its focus on community made community-based projects the “obvious” choice for grounding some of the concepts presented in course.

5. CONCEPTS RELATED TO LEADERSHIP

In addition to definitions, it is also helpful to look at a few concepts which are closely related to leadership but not always part of the definition. These concepts, though few in number, serve as launchpads to explore a wide array of leadership possibilities.

5.1. Leadership and the Problem

Leadership is invariably linked to problems and problem-solving. It is actually difficult to think of a place where leadership is needed where there is no problem. Problem-solving is seen as one of the major “skills” of engineers and thus engineering has some leadership traits

“built in”. To some extent, engineers are “natural” leaders.

Heifetz states that a problem exists when the reality as we perceive it is not in keeping with our values [5]. When reality does align with our values, we can declare the problem “solved”. A problem therefore identifies the gap, and the (partial) solution closes (reduces) the gap. Both problems and solutions occur as one of two types: technical and adaptive. A technical problem is one which is well understood; it takes little time to define the problem. If the solution to the problem is well understood, this is called a Type I situation; engineers would refer to this as routine design. In Type II situations, the problem is well understood, but its solution is not. The solution is said to be adaptive learning will have to take place if any solution is to be found. As an example, consider a doctor providing a “solution” of diet, exercise, medication and stress reduction to a person suffering from heart disease: the solution is adaptive as the patient must make the necessary life changes and it is out of the hands of the doctor. If both the problem and the solution are poorly understood (both adaptive), then we have a Type III situation. In Type I situations, leadership is not generally needed as people working in this situation know more or less what to do and then just about their business. In Type II and III situations, leadership is needed as it is no longer clear what needs to be done. We look to a leader to guide us through the learning.

It is also worth noting when a problem is no longer a problem. If the cancer is deemed incurable, then the cancer is no longer a problem; it is a condition. The problem becomes dealing with the cancer [5].

5.2. Leadership, Skills and Measurement

One of the words which is frequently encountered when exploring the engineering leadership literature is that of “skills”. In one article on engineering leadership, the word occurs about 120 times [7]. Leadership itself can be considered a skill or a subset of professional skills [7]. Then there are leadership skills. It is by no means clear what a skill is, and what understanding the use of the term, as opposed to another, affords us. It does appear that a skill is some identifiable component of a larger whole and that collecting certain skills to some unspecified level results in one being deemed something, such as a “leader” (or well positioned to become one). As identifiable components, skills hint at measurement. For example, some see the need for “developing of a research-based assessment for measuring student development in leadership skills” [1].

Individuals have skills, but not all leaders are individuals; they can also be organizations or countries. The U.S., for instance, often presents itself as a leader. During the 1990s, there was a growing concern over the state of manufacturing in the U.S. It seems that “when

Japan began to penetrate world markets in the 1960s, U.S. manufacturers refused to make the necessary changes in manufacturing methodologies to retain their *leadership* position” (pp. 2-3, emphasis mine) [9]. Is this leadership position assessed based on skills or something else? If we fast forward 20 years or so, the U.S. is now deemed to be the “undisputed leader in science and technology” [8]. It is clearly stated that this leadership is determined by the proportion the U.S. has of the world’s scientific and engineering researchers, research spending, publications, articles and citations, and the claim that 17 of the “top” 20 universities in the world are based in the U.S.

Leadership at the national level is measured differently than leadership at the level of an individual. This reflects our changes in the understanding of leadership as one shifts from individuals to organizations for one measures according to the model of reality that is brought to bear. And clearly, the U.S. perspective model of leadership at the national (read “political”) level is that of domination.

5.3. Leadership and Authority

We might be tempted to assume that those in positions of dominance came to be there through ingenuity and honest hard work. They therefore have something to offer the world and we listen to what they have to say. We see them as having authority and we defer to them.

Authority can be thought of as conferred power. In exchange for this power conferred, we expect services to be rendered, giving direction in times of stress. The power suggests a hierarchy and, upon finding our role within this structure, we settle down and our stress is reduced. However, this upward focus means that those more “downward” are often ignored. As we assume that this leader endowed with authority will solve our problem, we avoid the work that we must do (consider the patient who is suffering from heart disease and needs to make the necessary lifestyle changes apart from the doctor). We essentially treat the adaptive problem as a technical one, and the problem will likely remain unresolved [5].

In 2008, the National Academy of Engineering (NAE) released its 14 “Grand Challenges” facing the world and the engineering solutions which will essentially single-handedly deal with all of them [9]. These lofty claims speak not just to technical authority, but to “social and moral authority”, all forming part of their “status-seeking strategies” [12]. The NAE states that “[t]eachers must revamp their curricula and teaching styles to benefit from electronic methods of personalized learning”. Since when did engineers become experts in pedagogy? If the NAE is about establishing engineering leadership, how can this be reconciled to the idea that leaders must work effectively in multidisciplinary environments? This would appear to be a one-way flow of expertise as there is no indication that the teachers might be able to teach the engineers

something about their technology. Assertions of authority counter efforts to work as multidisciplinary teams.

Further evidence can be seen when NAE states that “[v]arious policies and political barriers must be addressed and overcome”. Again, the authority demands obedience (this time from politicians) and opposition must be eradicated rather than taken as an opportunity for learning to find better solutions. Within Heifetz framework, this amounts to turning what is essentially an adaptive problem into a technical one [5]. The statement also implies a belief that engineers work outside of (“transcend”, perhaps?) the political realm. Given the concern of U.S. maintaining its “leadership”, it is clear that engineering ultimately serves political goals. If engineers were truly apolitical, only the quality of the product would matter, not the political entity in which it is produced.

The type of authority presented so far might be described as formal authority. There is also informal authority [5]. Formal authority can be acquired at a discrete moment in time, such as when one is elected to office. To retain popularity, one must acquire informal authority through respect, admiration and trust. As one’s reputation rises, so does one’s informal authority. A doctor may have formal authority to treat a disease, but draws on informal authority to lead a patient through the emotionality of a terminal illness.

Martin Luther King was a man who had a great deal of informal authority. Millions looked to him for leadership, yet he had no power to hire or fire them. The ones he truly wanted to lead, however, were those over whom he had no authority, informal or otherwise, namely those who didn’t care about civil rights or hated his ideas [6]. Can it be claimed that these people needed leadership?

5.4. Leadership and Values

Values are significant to leadership in a number of ways. First, values identify the existence of a problem as the gap between our perception of reality and the desired state of affairs [5], as mentioned earlier. By implication, shifting values can create problems where none existed before, or make old problems disappear. The problem is compounded in that people in the same context can have different values and see a given situation differently. If the problems are adaptive and leaders enter the scene they, too, have their own set of values. The leaders’ values may or may not align with those they hope to lead.

Values are also used as a measure of leadership. The Competing Values Framework is used to explain how shared leadership works on teams. The “competing” part refers to opposing values and, to be effective, a leader must show behavioural flexibility with respect to these opposing values. For example, flexibility is needed to support relationships within an organization, but stability is needed to obtain results [16].

We can think of Martin Luther King’s struggle as not just a matter of authority, but of values. He wanted those opposed to his ideals to rethink their values [6]. He saw their values leading to the problem of racial discrimination, with all of its misery and destruction. Others, espousing other values, saw no problem, viewing the situation as, perhaps, a “natural state of affairs”. Values also explain Hitler. By a number of measures, Hitler was great leader, “mobiliz[ing] a nation to follow his vision” and “articulating [their] pains and hopes” [5]. He restored, at least for a while, the German economy. But his values were displaced, as he took advantage of social distress, maintained his position through fear and created scapegoats. It is undeniable that values have a significant impact on the kind of leadership exhibited by that individual and the well-being of those being led or even those not being led.

6. VALUES FOR LEADERSHIP

Engineers have values, but that does not mean that they know what they are. Indeed, classroom experience suggests that it is not unusual for engineering students to have no idea what they are. This tends to create an unquestioned sense of the “normal” and dismissive attitude towards those with a different sense of the “normal”. If any positive leadership qualities are to be developed in students, it is imperative that they become aware of their values and explore their implications. There is potentially a long list of values which are relevant to leadership. On the list, we might find values like perseverance, integrity and a sense of possibility. In this section, I wish to explore three values which I believe to be fairly common in engineering circles and which have the potential to undermine good leadership qualities. These are dependency, inevitability and efficiency.

6.1. Dependency

“Both education and character are artifacts of the civilization of mankind. ... leadership in engineering is but an extension of these artifacts of civilized behavior -- a quality that molds the direction society takes with its *increased dependence* on the advancement of science and technology” [3] (emphasis mine).

The idea that engineering (leadership) leads to a greater dependency on technology is an intriguing one. Instances of this increasing dependency are rather easy to find. It used to be that if your car broke down on the road, you take out your toolbox and fix it on the spot as best you could. Nowadays, if something is wrong with your vehicle, an ambiguous “engine light” comes on, and you bring your car to a mechanic and pay \$100-plus to find out what the problem is. The “No user-serviceable” parts seems to apply to most engineering products. Granted, advances in engineering have led to increased reliability in many cases, reducing the likelihood of

breakdown but, should a breakdown occur, there is generally little the user can do and the user is dependent on some outside “expert” to remedy the problem. One of the domino effects of this lack of user-serviceability is the throw-out-rather-than-fix mentality, resulting in increasing amounts of garbage.

Worded differently, we might say that “engineering demands more engineering” [12]. How does this compare to other professions? A teacher is considered good if the student is able to learn so much that the teacher is no longer needed. (Teachers are often seen to parallel parents, and “good” parents raise their children such that they can live independent lives.) A good doctor takes such good care of the patient that the doctor is no longer needed, except perhaps for the occasional check-up. On the other hand, there are times when medical practice may lead to more medical practice, such as when a doctor prescribes a drug and then a second drug to counter the side effects of the first drug. This might be called a “pharmaceutical fix”, paralleling Weinberg's “technological fix” [14] as the use and effects of drugs closely mimic that of engineering technology. This same effect can be seen even in agriculture. It used to be that, when farmers grew their crops, they would save part of the harvest as seed for the following year's planting. Now, with hybrid terminator crops (the results of genetic “engineering”), farmers are forced to return to the seed companies every year, losing some of their independence in the name of “high tech” and productivity. One can't help but notice that this dependency is tied to what is typically referred to as progress and advancement. As technology advances, its complexity tends to increase and its “user-serviceability” decreases.

The question of dependency becomes arguably more acute when we consider engineers working in “developing” countries as part of globalization. In this context, dependency is the enemy of the successful project. Many development projects have started with the best of intentions but, if the continued operation requires outside expertise, the system will eventually fall into neglect once the development team has left the site. In some cases, the local community may be even worse off if the initial system created additional dependencies. If a dairy farmer, for instance, increases his herd size as he switches to electric milking machines, he cannot easily go back to milking by hand if the system fails.

Martin Luther King's form of leadership was about reducing dependency [6]. As a leader, King sought to influence those around him to engage in discussion and bring about widespread change. He wanted to influence those who ignored him or hated what he stood for. If King were to produce a dependency on his leadership, the arguments would be localized around him and it would take much longer to effect any lasting change.

At first glance, it might seem odd to posit dependency as an engineering value. Yet, if engineering products

embody the values of their creators and technology creates dependency, engineers can be said to have, unwittingly or otherwise, that value. There remain some lingering questions. First, does engineering necessarily result in society having a greater dependence on technology? Can engineers promote technology while reducing dependencies? Can, for instance, user serviceability and reliability be increased simultaneously? To what extent should leaders be paying attention to the creation of (in)dependencies? Is greater dependency just the “cost of doing business”?

6.2. Inevitability

Inevitability manifests itself in many forms within engineering. We can think of inevitability as a path leading to some destination, often ill-defined. If one “goes with the (inevitable) flow”, one will necessarily be on this path. One can take deliberate action to deviate from the path but, sooner or later, one will find oneself back on the path, and all one will have to show for it is the wasted effort. The lack of a well defined destination does not seem to be a deterrent as, thanks to the accompanying belief in progress, any movement along the path towards this destination constitutes a better state of affairs. Or course, what constitutes “progress” depends on one's perspective but, for engineers, “progress” often means a higher standard of living. And this higher standard of living is thanks to ever-improving technology. Perhaps compared to other kinds of progress, technological progress can be relatively easily measured, such as through increased efficiency, better performance, reduced cost and greater user-friendliness.

Inevitability is not explicitly taught in engineering programs, but personal anecdotal evidence suggests that students do indeed learn this. Some engineering students, for instance, believe that it was necessary to go through the industrial revolution, with all of its misery, so that we could enjoy the standard of living we have today. To believe that people necessarily “had” to go through misery so that we might live well is rather disconcerting but, at the same time, it does allow for some interruption of the continuous progress myth as at least part of the industrial revolution was not actually better than the agrarian society which preceded it. Another example which suggests a belief in inevitability is that some students seem quite comfortable with the idea that people have “instincts”. Hence, some things we do automatically, quite apart from learning, without having to stop and think about it; this is just the way things happen. Yet a third classroom example is the refrain of “Well, that's the way the world works!” implying that we can hardly expect the world to work otherwise.

The belief in inevitability can also be found in the literature. In demanding that teachers use “electronic methods of personalized learning”, the NAE makes no

statement regarding the shortcomings of other teaching methods, nor of the virtues of the electronic. It would seem that, sooner or later, these changes are going to take place and teachers might as well get used to it. A belief in inevitability can also be seen in what is missing in the literature. The heightened need for leadership is often linked to the demands of globalization, yet few within the engineering world seem to question the legitimacy of globalization itself. Are engineers expected to blindly follow the demands of globalization? Is there some universal law that makes fighting against it futile? Is globalization inherently good and so to work against it is unethical? What is actually at issue here?

As designers, engineers necessarily change the world; otherwise there would be no point in designing. And leaders are said to be “agents of change”. How can we reconcile a belief in inevitability with a belief that engineering design can change the world? It seems that the world is classified into two large groups, one containing those things which can be changed and one those things which cannot (or perhaps should not). How does one decide which group a given part of the world belongs to?

When engineering students are about to graduate and find a job, they often speak of going into the “real world”. By implication, the academic, learning environment is not real but rather contrived. Presumably, the academic world shelters its members from certain harsh factors of the “outside” world. Yet, in almost any “world”, those within it are sheltered from something. Working for an engineering firm, you might be sheltered from the ethical issues related to what you are designing. Is this world “real”? Why would paying attention to ethical issues, such as in an academic context, be any less “real” than paying attention to, say, economic issues? The point is, all worlds are contrived, be they the academic world, the business world, or anything else. If we hope to claim otherwise, how can one go about proving that this world is “real” and that one is not?

Dividing the world into the changeable and the unchangeable provides a great deal of comfort in much the same way that an upward focus on authority reduces stress. As your unchangeable world grows and your changeable one shrinks, your ethical obligations are reduced. This is, of course, why technological determinism is so attractive to some engineers as it allows them concentrate their expertise on technical issues without having the worry about the moral implications of their work. If engineering leaders are to address complex problems and be “agents of change”, they cannot confine themselves to the technical world; they must explicitly confront ethical issues as the worlds collide. Ethics also means that leaders cannot assume that a certain world is unchangeable for the sake of convenience; all worlds must be viewed as contrived. And therefore all worlds

are potentially changeable and demand our ethical attention.

6.3. Efficiency

Efficiency is one of the important measures engineers use to determine if the newer technology is “better” than the old. The basic measure of efficiency is the ratio of output to input. Inputs are often measured in terms of energy (or time) and output measurements depend on the function of the product.

Efficiency is also used to assess other areas of engineering, such as design. The efficient design process reduces the distance from problem to solution, making sure that all effort expended brings one closer to the solution. A similar use of the term can be seen with leadership, where the “entrusting the leadership development of undergraduate engineering students to the co-curriculum is an *inefficient* method of developing leadership skills for undergraduate engineers” (emphasis mine) [7]. It is often thought that leadership qualities can be acquired by student engagement in co-curricular activities, but the study suggests that student better acquire these qualities when the leadership development is explicitly part of the regular curriculum. We might think of this as designing leadership development deliberately into the engineering program.

McCaulay [8] also uses the term in various senses related to leadership. Efficiency is related to time (“efficiently utilizing time”), teams (“more creative, efficient, and effective team”), communication (“[i]n the course of efficient communication, project leaders enable individuals”), management (“Leaders must manage relations efficiently”), leadership itself (“several examples of efficient leadership”) and even praise (“Learning how to efficiently praise others is an excellent skill”). This last example is particularly telling as it shows how the value of efficiency is related to the concept of skills; both are forms of measurement.

Efficiency is goal oriented, about the product more than the process, the ends more than the means. If one spends too much time focusing on the goal, everything, including people, in the process becomes instrumental to that goal. This runs the risk of abuse. Sometimes a problem is just an excuse to get people together and to bring meaning to life, and the solution is secondary. The idea that leadership is about community-building means that the good leader does necessarily have to solve the problem.

7. CONCLUDING REMARKS

Leadership is a complex concept as evidenced by its many definitions. Our understanding of leadership and its potential depends a great deal upon where we are and our worldviews or models of reality. Like any discipline, engineering has its own worldviews and models of reality

which tend to suggest certain forms of leadership; some forms may be considered “good” and others, “bad”.

If we truly believe we live in a complex world, then the problems which arise must, at least some of the time, be complex. To use simple (technical) solutions to treat complex (adaptive) problems will, ultimately, only serve the needs of the few. If we ultimately wish to serve the many, then complex problems must be addressed as such, and multiple worldviews, sometimes conflicting, must be brought to bear.

To help unravel the complexities of leadership, we can explore closely related concepts such as the problem, skills, authority and values. The problem tells us when we might need leadership, skills warn us of the pitfalls of measurement and their inherent bias, authority draws our attention to power, and away from multidisciplinary, and values separate “good” leadership from “bad” and provide a helpful learning framework.

Engineering values are not normally explored in traditional engineering programs and engineers are often unaware of the values they hold. Nevertheless, these values will eventually find their way to the products engineers produce. Dependency is one such implicitly built-in value and, when brought to bear on leadership, may, such as in the context of developing countries increase the vulnerability of those supposedly being helped. Inevitability is very subtle and may lead to engineers refusing to change that which, ethically speaking, must be changed. Efficiency can lead to excessive focus on the product and the resulting streamlined approach leaves too many issues unresolved.

So, what then, is “engineering leadership”? In the first instance, it is that form of leadership which embodies traditional engineering values. From a pedagogical perspective, “engineering leadership” is that form of leadership that draws particular attention to engineering values which are likely to have a detrimental effect on leadership and suggests values which might be adopted instead.

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