# CIVIL ENGINEERING LEADERSHIP

## CE 4200

### Professional Engineering Practice Issues

Spring 2022 Semester

William D. Lawson, P.E., Ph.D.

# CIVIL ENGINEERING LEADERSHIP

**Professional Engineering Practice Issues**

## CONTEXT

# BOK3 Outcomes

1. Mathematics
2. Natural Sciences
3. **Social Sciences**
4. Humanities
5. Materials Science
6. Engineering Mechanics
7. Experimental Methods and Data Analysis
8. **Critical Thinking and Problem Solving**
9. **Project Management**
10. Engineering Economics
11. Risk and Uncertainty
12. Breadth in Civil Engr Areas
13. Design
14. Technical Depth
15. Sustainability
16. Communication
17. **Teamwork and Leadership**
18. Lifelong Learning
19. **Professional Attitudes**
20. **Professional Responsibilities**
21. Ethical Responsibilities

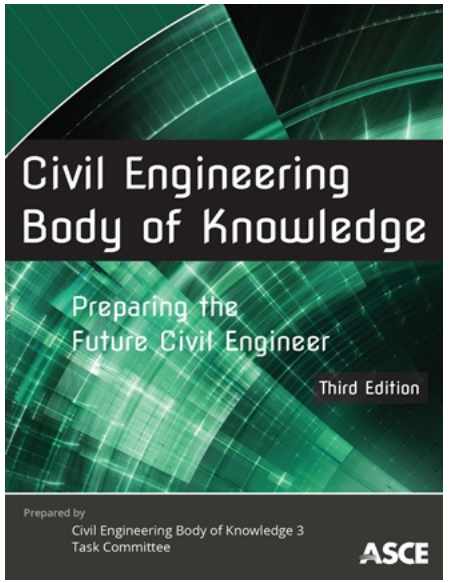
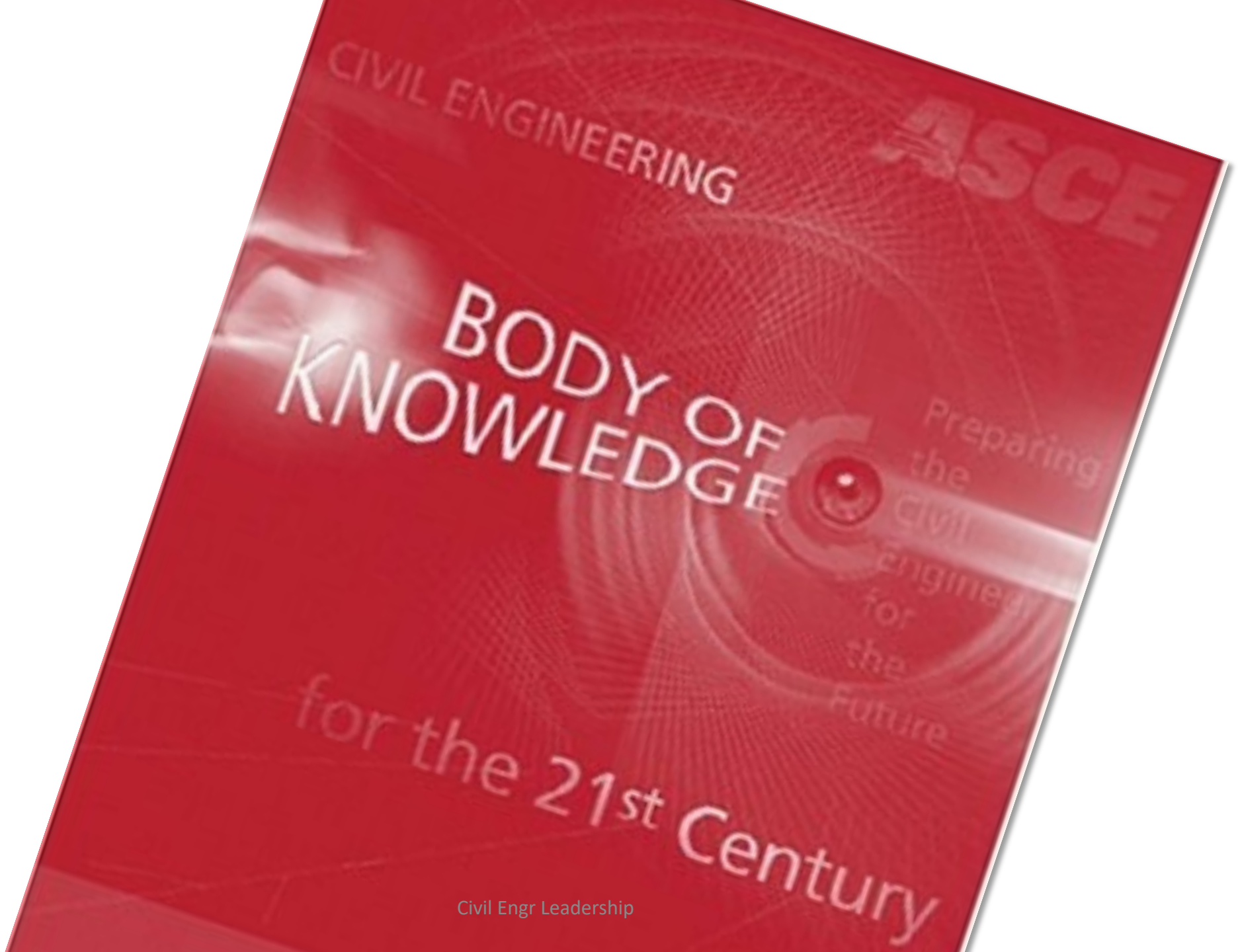


**Table 2-17a.** Teamwork and Leadership (Cognitive Domain).

| Cognitive Domain Level of Achievement | Demonstrated Ability | Typical Pathway |
|---|---|---|
| 1 Remember (remember previously learned material) | **Identify** concepts and principles of teamwork and leadership, including diversity and inclusion. | Undergraduate education |
| 2 Comprehend (grasp the meaning of learned material) | **Explain** concepts and principles of teamwork and leadership, including diversity and inclusion. | Undergraduate education |
| 3 Apply (use learned material in new and concrete situations) | **Apply** concepts and principles of teamwork and leadership, including diversity and inclusion, in the solutions of civil engineering problems. | Undergraduate education |
| 4 Analyze (break down learned material into its component parts so that its organizational structure may be understood) | **Select** concepts and principles of effective teamwork and leadership, including diversity and inclusion, in the solutions of civil engineering problems. | Mentored experience |
| 5 Synthesize (put learned material together to form a new whole) | **Integrate** concepts and principles of effective teamwork and leadership, including diversity and inclusion, into the solutions of civil engineering problems. | Mentored experience |
| 6 Evaluate (judge the value of learned material for a given purpose) | **Evaluate** the effectiveness of leaders and teams in the solution of civil engineering problems. | |

**Table 2-17b.** Teamwork and Leadership (Affective Domain).

| Affective Domain Level of Achievement | Demonstrated Ability | Typical Pathway |
|---|---|---|
| 1 Receive (be aware of, be willing to receive, and be attentive to a particular phenomenon or behavior) | **Acknowledge** the importance of teamwork, leadership, diversity, and inclusion. | Undergraduate education |
| 2 Respond (actively participate in an activity, attend to a task, and react to motivation) | **Practice** concepts and principles of teamwork, leadership, diversity, and inclusion. | Undergraduate education |
| 3 Value (attach value to a particular object, phenomenon, or behavior) | **Value** the need for teamwork, leadership, diversity, and inclusion. | Mentored experience |
| 4 Organize (sort values into priorities by contrasting different values, resolving conflicts between them, and creating a unique value system) | **Display** effective teamwork and leadership, including support of diversity and inclusion. | Self-developed |
| 5 Characterize (follow a value system that controls behavior that is pervasive, consistent, predictable, and a defining characteristic) | **Advocate for** teamwork, leadership, diversity, and inclusion. | |


CIVIL ENGINEERING
ASCE
BODY OF KNOWLEDGE
Preparing the civil engineer for the future
for the 21st Century

# PROFESSIONAL OUTC

# Outcome 20: Leadership

## Overview

In a broad sense leadership is developing and engaging others in a common vision, clearly planning and organizing resources, developing and maintaining trust, sharing perspectives, inspiring creativity, heightening motivation, and being sensitive to competing needs. Leadership is the art and science of influencing others toward accomplishing common goals and does not necessarily require a formal role or position within a group. Engineers must be willing to lead when confronted with professional and/or ethical issues. More often "employers [are] calling for graduates who are not merely expert in design and analysis but who possess the leadership skills to apply their technical expertise and to capitalize on emerging construction and information tech- management models, and ...[64] Many also ...is or

principles of leadership and be able to practice them as their careers advance."[4] Clearly the acquisition of leadership skills and the art of practicing leadership are vital to the future of civil engineering. By the very nature of a profession that requires the attainment of strong analytical and rational decision making skills, engineers are particularly well suited to assume leadership roles.

B: *Apply* leadership principles to direct the efforts of a small, homogeneous group. (L3) The best place to start the formal leadership development process is at the undergraduate level.[66] Leadership can be taught and learned. Leadership principles include being technically competent, knowing oneself and seeking self improvement, making sound and timely decisions, setting the example, seeking responsibility and taking responsibility for one's actions, communicating with and developing subordinates both as individuals and as a ...and ensuring that the project is ...supervised, and ...education

# Guidance for Students

## Civil Engineering Body of Knowledge for the 21st Century

### *Actively Participate in Campus Organizations*

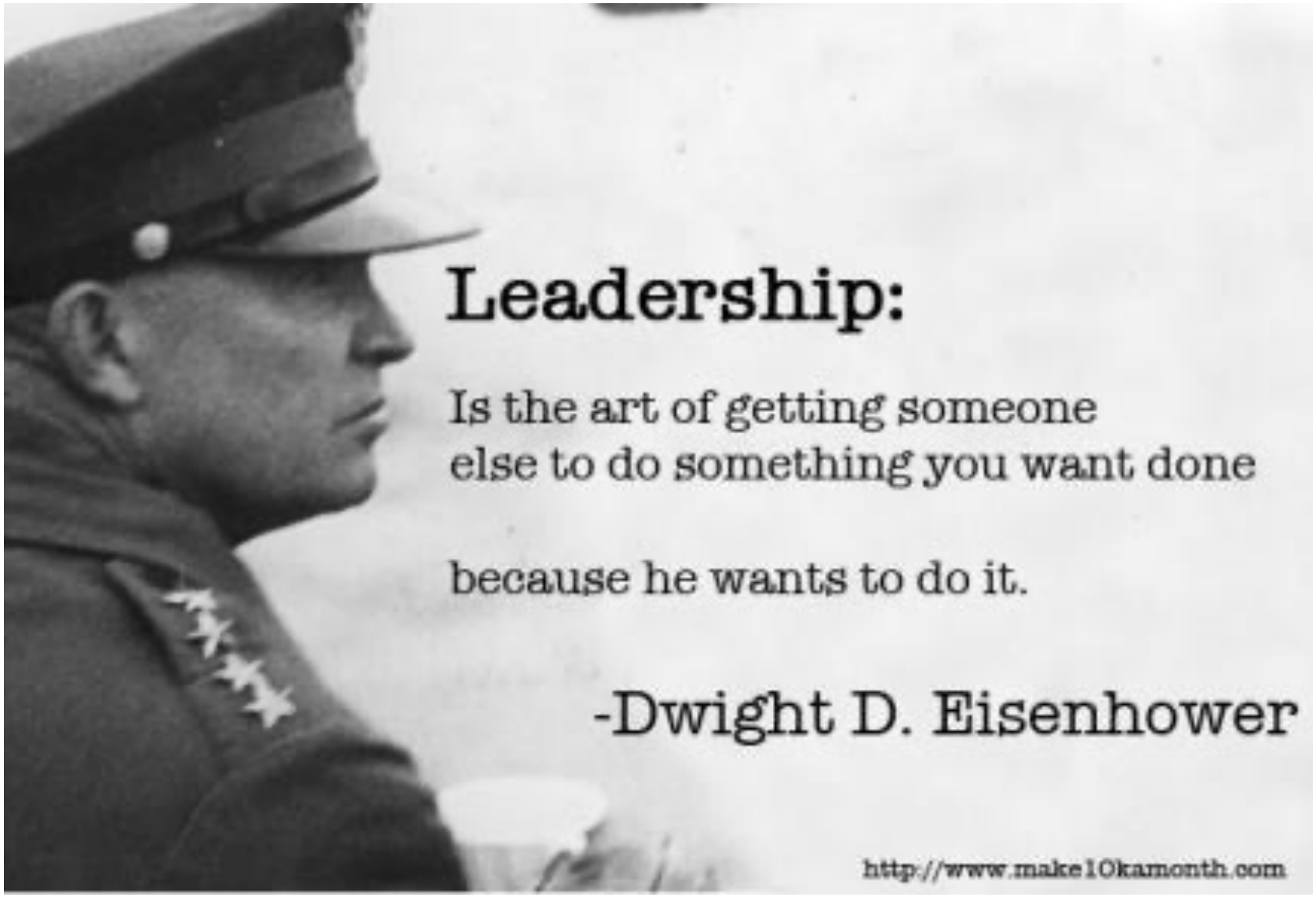
You can move toward fulfillment of outcome 16 (communication), outcome 20 (leadership), and outcome 21 (teamwork) by active, as apposed to passive, participation in one or more campus organizations. You could choose from the student chapters of such engineering organizations as ASCE, NSPE, the Society of Women Engineers, the Society of Hispanic Professional Engineers, and the National Society of Black Engineers. However, you can also learn about communication, leadership, and teamwork by being actively involved in such campus-wide activities and groups as student government, service clubs, sports teams, a student newspaper, and sororities and fraternities. Consider your active participation in such groups as these as an opportunity to serve while enhancing your knowledge, skills, and attitudes.

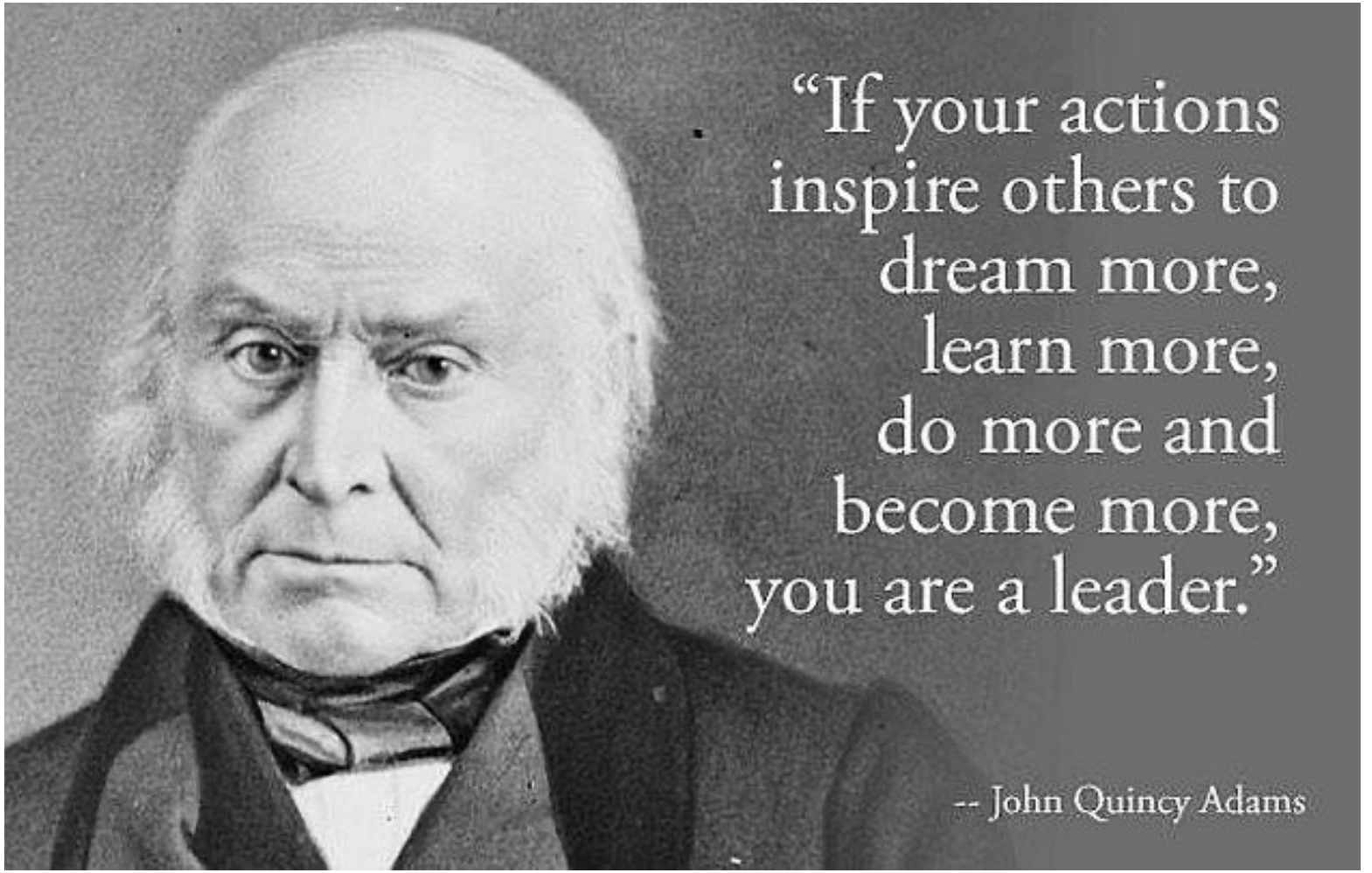
*Be actively, as opposed to passively, involved in at least one campus organization.*

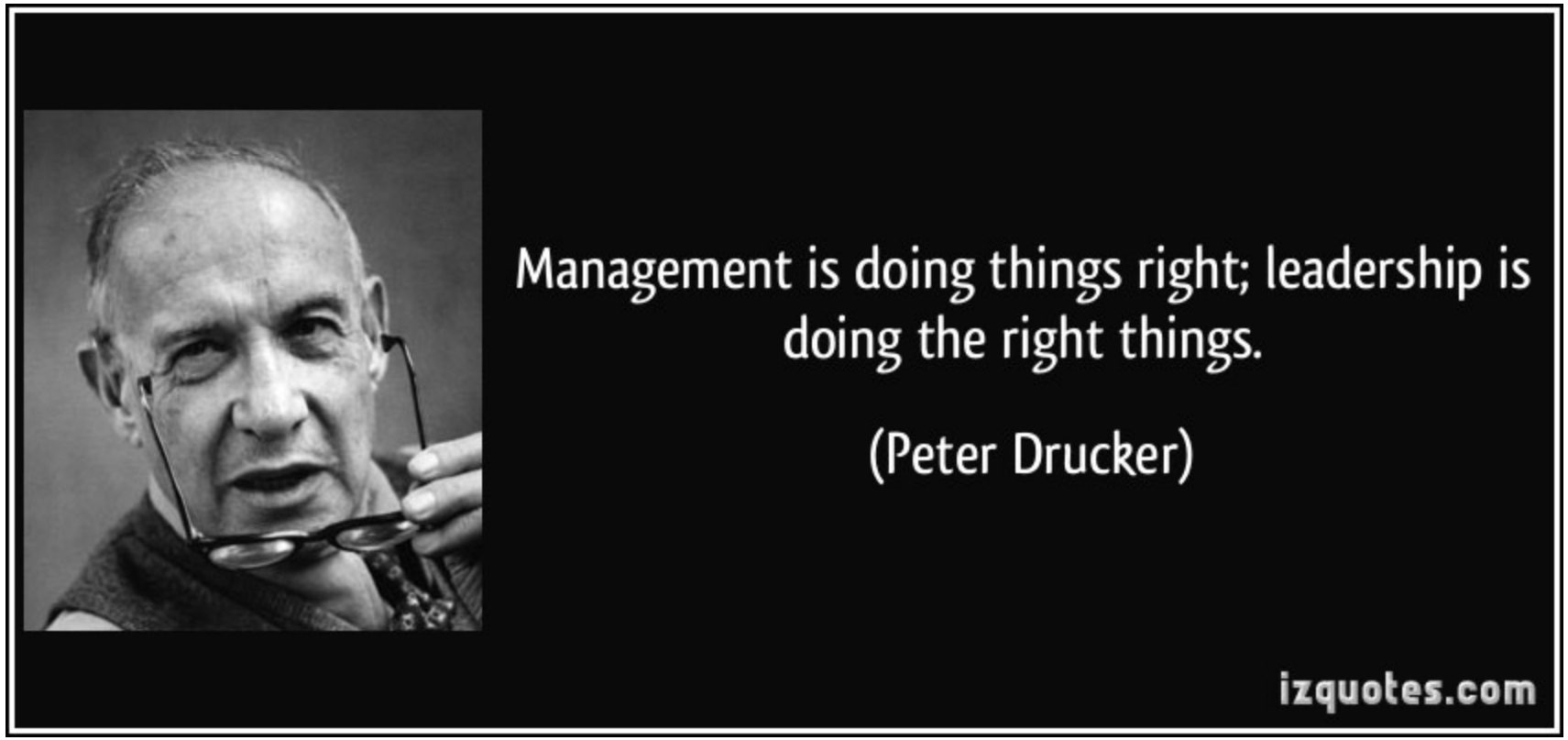
# CIVIL ENGINEERING LEADERSHIP

**Professional Engineering Practice Issues**

## SOME LEADERSHIP QUOTES

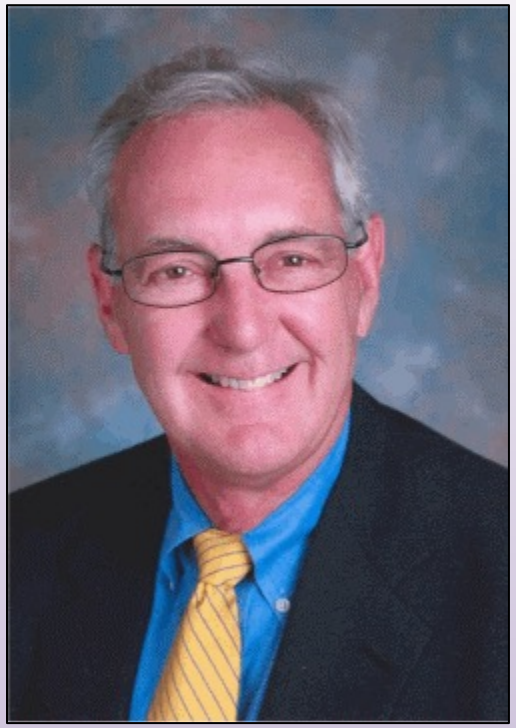

Leadership:
Is the art of getting someone
else to do something you want done
because he wants to do it.
-Dwight D. Eisenhower
http://www.make10kamonth.com

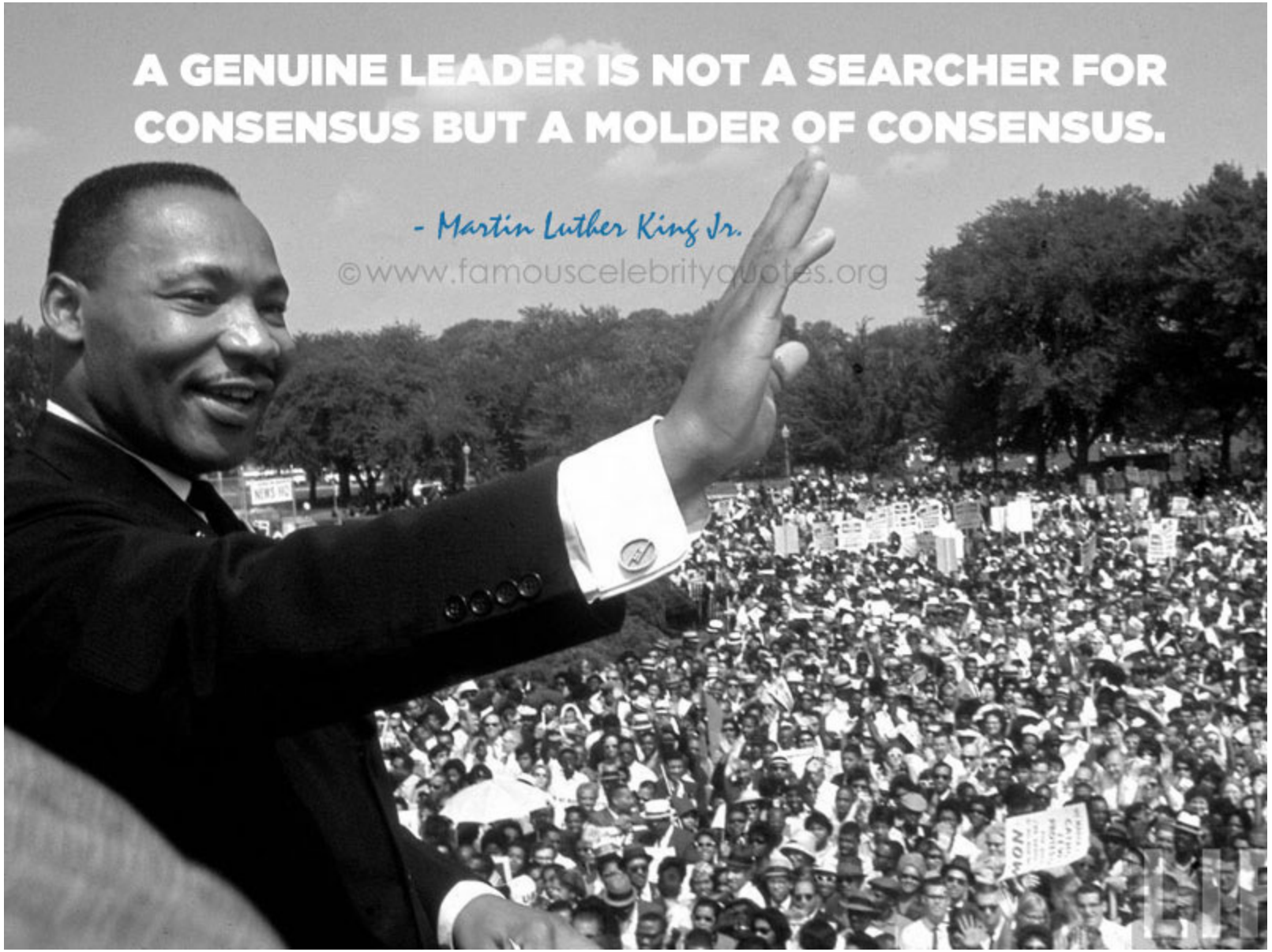

"If your actions
inspire others to
dream more,
learn more,
do more and
become more,
you are a leader."
-- John Quincy Adams

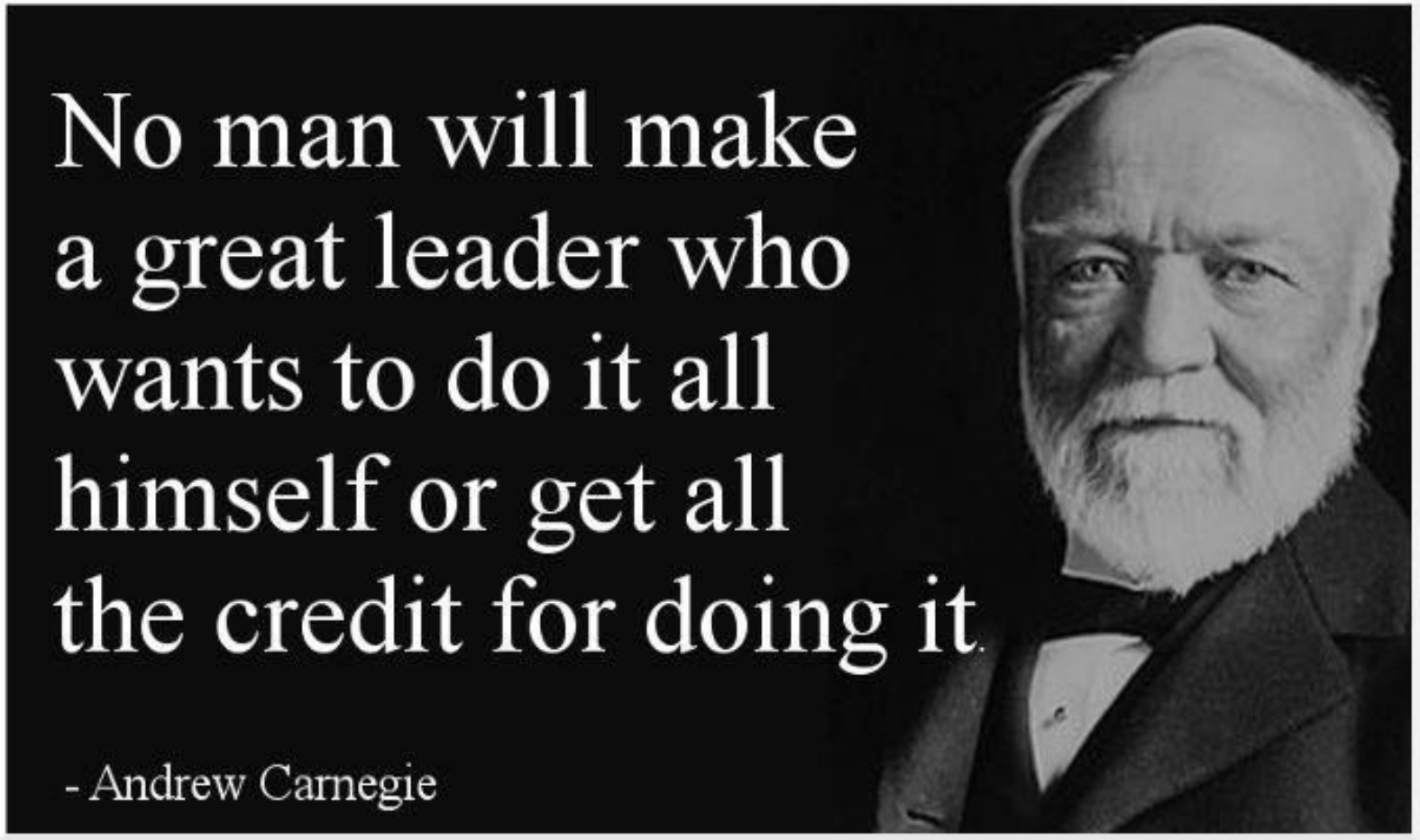

Management is doing things right; leadership is doing the right things.
(Peter Drucker)
izquotes.com

In the world of work, there are only two futures -- the one you proactively create for yourself and your organization or, in the vacuum of little or no action, the future created for you by others.

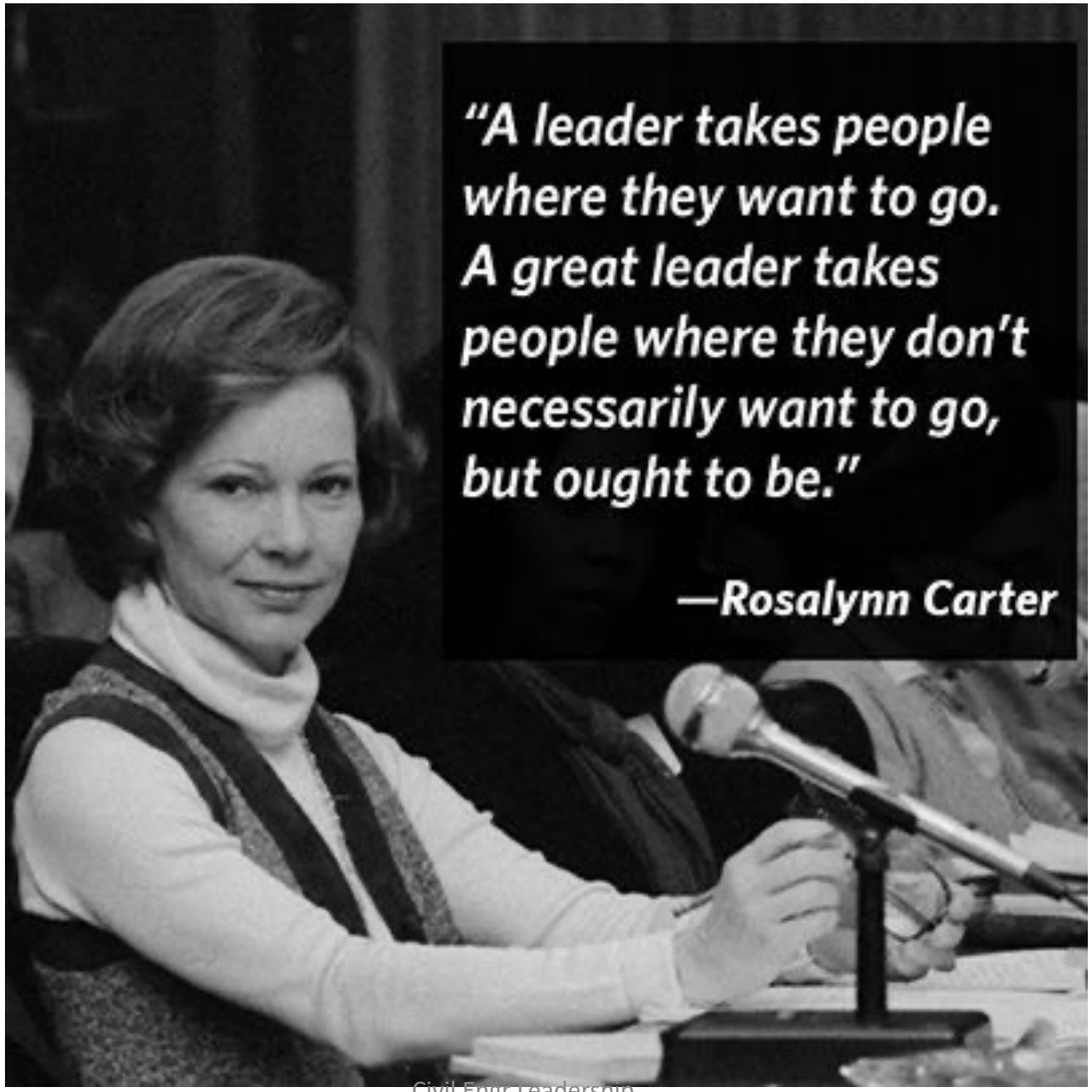
-Stu Walesh

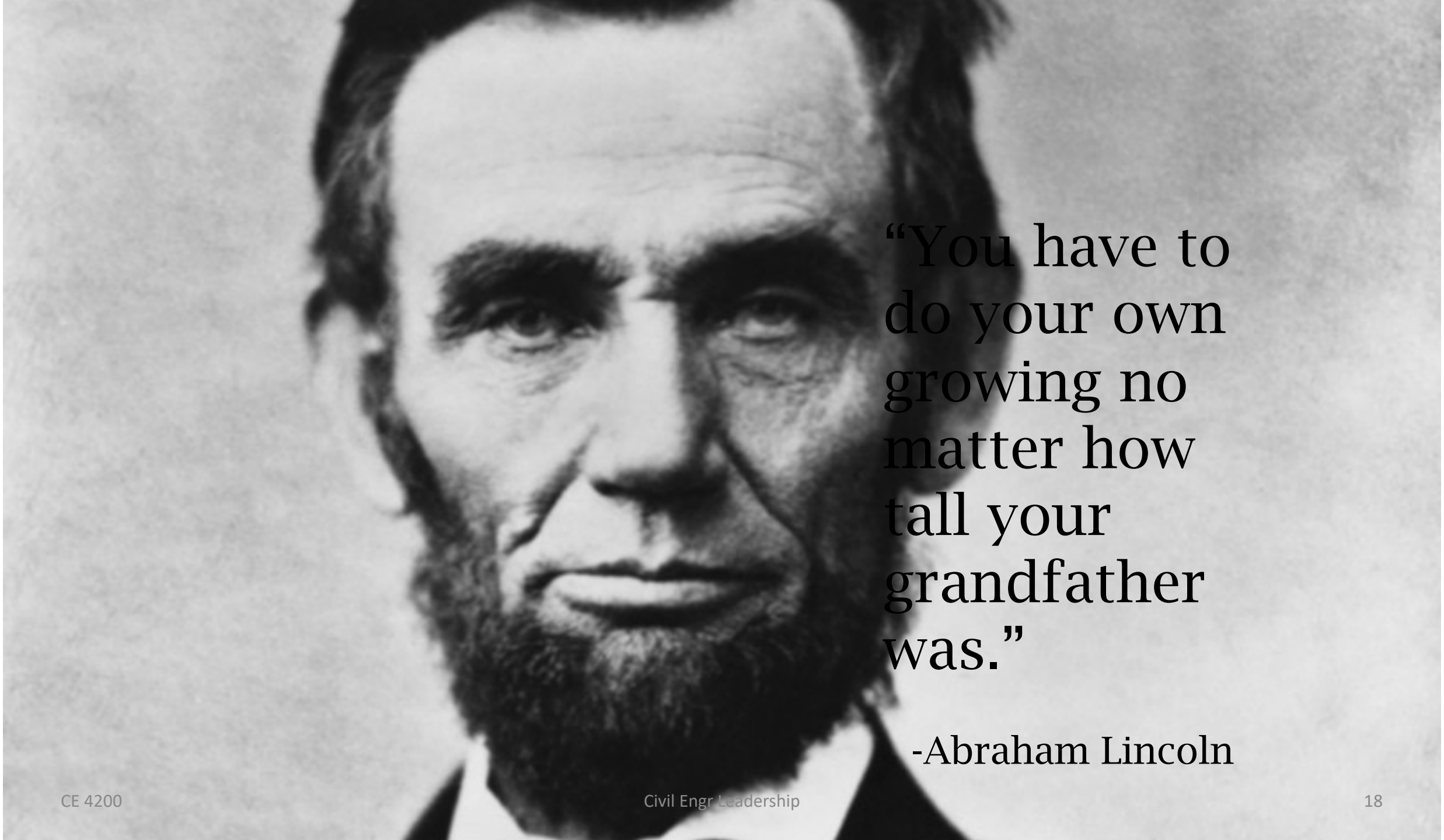



A GENUINE LEADER IS NOT A SEARCHER FOR CONSENSUS BUT A MOLDER OF CONSENSUS.
- Martin Luther King Jr.
©www.famouscelebrityquotes.org


No man will make
a great leader who
wants to do it all
himself or get all
the credit for doing it.
- Andrew Carnegie


Leadership is influence. To the extent we influence others, we lead them.
Charles R. Swindoll
quotefancy


"A leader takes people where they want to go. A great leader takes people where they don't necessarily want to go, but ought to be."
—Rosalynn Carter


“You have to do your own growing no matter how tall your grandfather was.”
-Abraham Lincoln

"An engineer is hired for his or her technical skills, fired for poor people skills, and promoted for leadership and management skills."

-Jeffery S. Russell

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## LEADERSHIP TRAITS

# GROUP EXERCISE

1. ON YOUR OWN: Identify <u>three</u> characteristics of a good leader
2. SHARE our lists.

# U.S. Army's 23 Traits of Character

- Bearing
- Confidence
- Courage
- Integrity
- Decisiveness
- Justice
- Endurance
- Tact
- Initiative
- Coolness
- Maturity
- Improvement
- Will
- Assertiveness
- Candor
- Sense of humor
- Competence
- Commitment
- Creativity
- Self-discipline
- Humility
- Flexibility
- Empathy/Compassion

# CIVIL ENGINEERING LEADERSHIP

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## LEADERSHIP ASSIGNMENT

**ASSIGNMENT 4: Engineering Leadership**
CE 4200 Professional Practice Issues
Spring 2022 Semester
100 POINTS

**Date Assigned:** 02/23/2022

**Date Due:** 03/07/2022

**Topic:** Engineering Leadership

**Type:** Individual

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**I. PURPOSE**

The purpose of this learning exercise is to introduce you to *civil engineering* leadership issues, to familiarize you with the *civil engineering* literature on leadership, and to develop your understanding of leadership as it applies to the *civil engineering* profession.

A. SKILLS

This assignment is to help you practice the following skills that are essential to your success in this course and in professional life beyond school:

i. Locate articles on leadership, define leadership, explain leadership in engineering practice
ii. Examine various aspects of leadership, identify and evaluate alternative leadership models
iii. Judge leadership effectiveness, formulate your own leadership ideal
iv. Grow and mature as an engineer leader, and ultimately, lead others in this process

B. KNOWLEDGE

This assignment will also help you to become familiar with the following important content knowledge in this discipline:

i. Topic 1. Concepts of leadership
ii. Topic 2. Practical wisdom from exemplary engineering leaders
iii. Topic 3. Leaders vs. managers
iv. Topic 4. Leadership issues specific to certain groups, *e.g.*, students, women, academia, etc.
v. Topic 5. Contemporary case study examples in civil engineering leadership

...lect five articles on leadership that are of ...y you selected these particular ...This part of the assignment ...xceeding ONE

# ASCE Journals


# ASCE Journals


# Influences Impacting Leadership Development

Charles O. Skipper, M.ASCE; and Lansford C. Bell, F.ASCE



## Abstract

The construction industry is placing increased emphasis on developing leadership skills for project managers. This paper describes a research project that was executed to analyze the causal influences on the development of project managers, whom the authors believe also must be leaders. The research compared two groups of project managers within a large construction company. One group was top performing construction managers as selected by corporate executives, while the second group was a randomly selected control group. The research examined influences on career development including job experience, project management experience, formal project management training, formal leadership training, and job assignments. The research also solicited opinions from both groups as to what they perceived as factors impacting leadership career development. Statistical differences between the groups were found in the areas of

Leadership and Management in Engineering / Volume 8 Issue 2 - April 2008



# Leadership versus Management: How They Are Different, and Why

Shamas-ur-Rehman Toor and George Ofori



## Abstract

"Leadership" is different from "management"; many just know it intuitively but have not been able to understand this difference clearly. These are two entirely different functions based on their underlying philosophies, functions, and outcomes. Similarly, leaders and managers are not the same people. They apply different conceptualizations and approaches to work, exercise different ways of problem solving, undertake different functions in the organizations, and exhibit different behaviors owing to their different intrinsic and extrinsic motivations. Although discretely different, the terms "manager" and "leader" are often confused and used interchangeably. This paper attempts to address this issue at various levels, including etymological, development, conceptual distinctions, definitional complexities, functional divergence, and

Authors

**Shamas-ur-Rehman Toor** and

**George Ofori**

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**ASCE Subject Headings:** Leadership, Team building, Business organizations, Organizations, Knowledge management, Motivation, Managers

**Leadership and Management in Engineering**

Vol. 8, Issue 2 (April 2008)

# Everything I Needed to Know about Leadership I Learned in the Boy Scouts

Francis E. Griggs Jr., F.ASCE



## Abstract

Leadership is one of the most important skills an engineer can possess in the twenty-first century. A Google search on the term "leadership" yields more than 170,000,000 hits indicating it is one of the most written about and discussed management concerns. This paper describes the Boy Scout program, which is one of the best leadership programs in the world and begins to teach boys to be leaders at age 11. Many leaders of business, government, and education have indicated that the Boy Scout program was one of the most important experiences in their lives, one that impacted their thinking and actions throughout their careers. The article ends with a modest proposal of ways the Boy Scouts, civil engineering departments, and ASCE can collaborate to train future leaders of the profession.

Leadership and Management in Engineering / Volume 10 Issue 4 - October 2010



# Successful Leadership Development for Women STEM Faculty

Deborah J. O'Bannon, Ph.D., P.E., F.ASCE; Linda Garavalia, Ph.D.; David O. Renz, Ph.D.; and S. Marie McCarther, Ed.D.



## Abstract

The Leadership Institute, funded by the National Science Foundation to encourage women faculty in engineering and science to prepare for academic leadership roles, was designed to increase the accessibility of such training for faculty in the Midwest by providing short-term workshops within their geographic area at low cost. The leadership training was limited to women who had already received tenure and focused on the portable business and leadership skills women need to make a successful entry into department chair and dean positions. The participants learned about budgeting conventions at their home campuses, but most of the training was designed to generally equip them for academic leadership roles. This article describes the training and reports the results of longitudinal data collection to document the

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Vol. 10, Issue 4 (October 2010)

# Emotional Intelligence and Leadership Styles in Construction Project Management

Riza Yosia Sunindijo; Bonaventura H. Hadikusumo; and Stephen Ogunlana



## Abstract

Human factors are of paramount importance to the success of projects. Although a lot of studies have been carried out on human factors in project management, not much research has been done on emotional intelligence (EI). Studies have shown that EI is beneficial to both the individual and the organization. The benefits of EI to project management were investigated in terms of the style of leadership. The study was conducted in Thailand by interviewing project managers and engineers (PMEs); and client representatives. The results showed that EI affected leadership behavior of the project leader. PMEs with higher EI tend to use open communication and proactive leadership styles. It is also found that EI generates delegating, open communication, and proactive behavior, which can bring positive

# Leadership and Organizational Vision in Managing a Multiethnic and Multicultural Project Team

D. Michael Miller; Ronald Fields; Ashish Kumar; and Rudy Ortiz



## Abstract

To meet the demands of managing complex projects, project leaders face challenges of daily leadership behavior and organizational vision to manage a project team. The challenges are compounded when the task of creating a project culture is also influenced by cultural, ethnic and corporate differences. A program management team involves many disciplines: project management, planning and engineering, cost estimating, scheduling, material procurement, program controls, management information systems, administration, construction inspection, and others. Different personality types often gravitate to predictable areas of function during the course of their careers. Managing these differing personality types is one challenge of program leadership. Another equal challenge is managing people of widely differing cultural and ethnic backgrounds. What is regarded as a routine

# Citizenship, Character, and Leadership: Guidance from the Words of Theodore Roosevelt

Francis E. Griggs Jr., Dist.M.ASCE



## Abstract

Most people would agree that a good leader of the 21st century must first be a person of character and integrity. Too often, however, many do not follow through on the need of a leader to be a good citizen or realize that he or she practices in a profession that is ethically bound to promote the health, safety, and welfare of the public. One of the greatest speeches ever given on this subject, in the eyes of the author, is one delivered by Theodore Roosevelt at the Sorbonne in 1910 titled "Citizenship in a Republic." This paper takes the words Roosevelt spoke in the early twentieth century and shows how they apply in the early 21st century. The civil engineer can learn from them.

# THANK YOU.