ENGINEERS REGISTRATION BOARD
MENTORS' SEMINAR

Mentoring Techniques, Technical Report Writing & Engineering Ethics

Richard J. Masika
masikarj@gmail.com, P. O. Box 6220, Arusha
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Contents

PART I: Mentoring Principles and Techniques

- Overview of mentoring

- Mentoring Modalities

- Building effective mentoring relationship

- Critical mentoring Skills

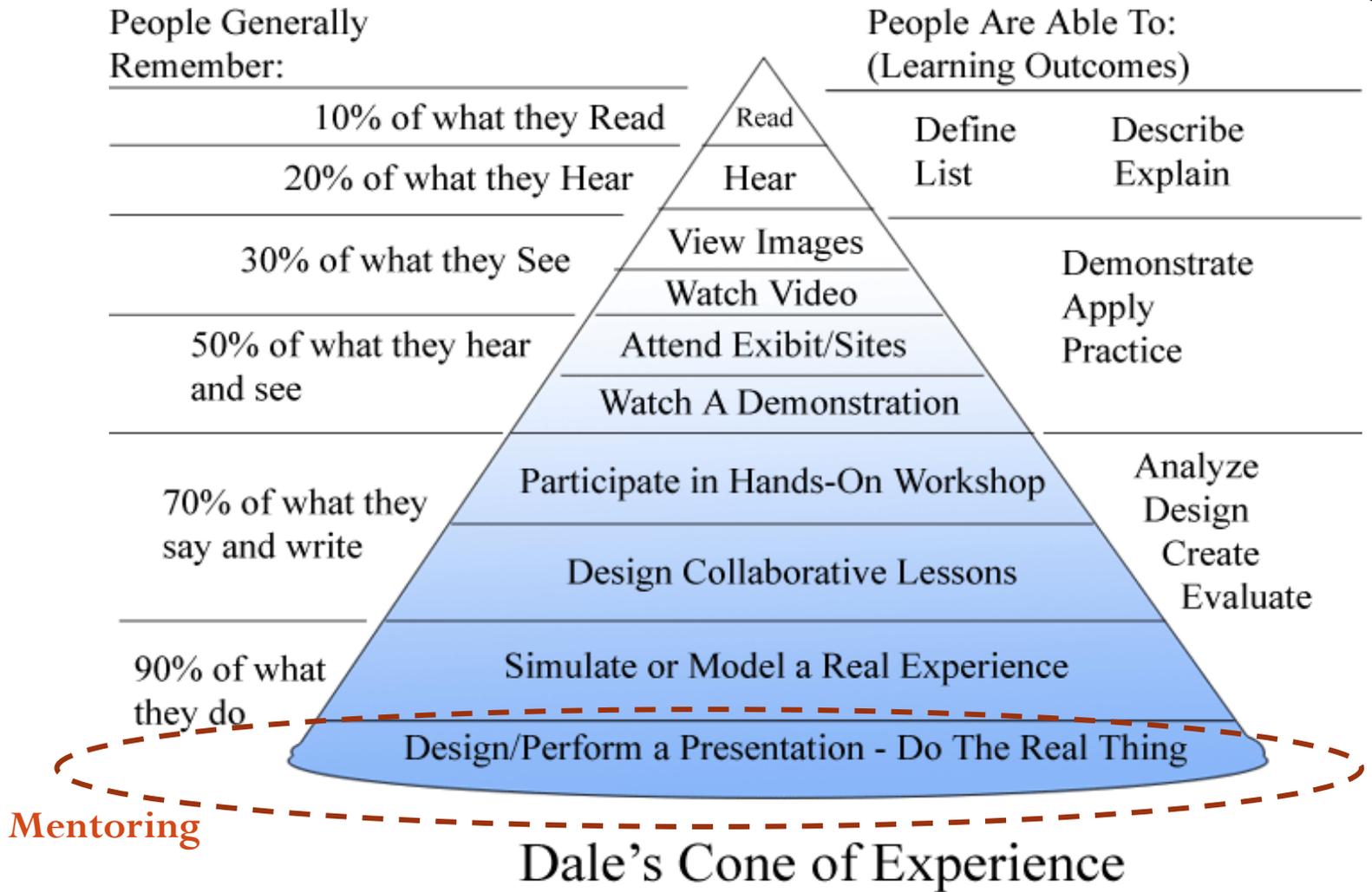- Potential challenges and how to address them

Graduate engineers

What next?

Mentoring

- A <u>Career Management Tool</u> used by organisations to nurture and develop their staff/members (GE) professionally to PE

- A PROFESSIONAL <u>relationship</u> where - help by one person to another in making significant transitions in knowledge, skills, attitudes and work or thinking.

- A <u>process</u> whereby someone with more experience or expertise provides support, professional counseling and advice to a less experienced colleague or novice (through planning, observation & reflective conversation)

Effects of various Teaching Methods on students/trainees learning

People Generally Remember:

People Are Able To: (Learning Outcomes)

10% of what they Read	Read
20% of what they Hear	Hear
30% of what they See	View Images
	Watch Video
50% of what they hear and see	Attend Exibit/Sites
	Watch A Demonstration
70% of what they say and write	Participate in Hands-On Workshop
	Design Collaborative Lessons
90% of what they do	Simulate or Model a Real Experience
	Design/Perform a Presentation - Do The Real Thing

Define
List

Describe
Explain

Demonstrate
Apply
Practice

Analyze
Design
Create
Evaluate

Mentoring

Dale's Cone of Experience

Mentor

- is the senior in the profession (usually not a Manager) who acts as a role model and helps the trainee to pick up the distinctions of the profession
- *The role of the mentor is to develop the mentee's PROFESSIONAL unique skills and abilities, not to make a clone of the mentor*
- A mentor is a guide who leads a traveller on a pilgrimage of discovery - Harris-Schenz (1990)
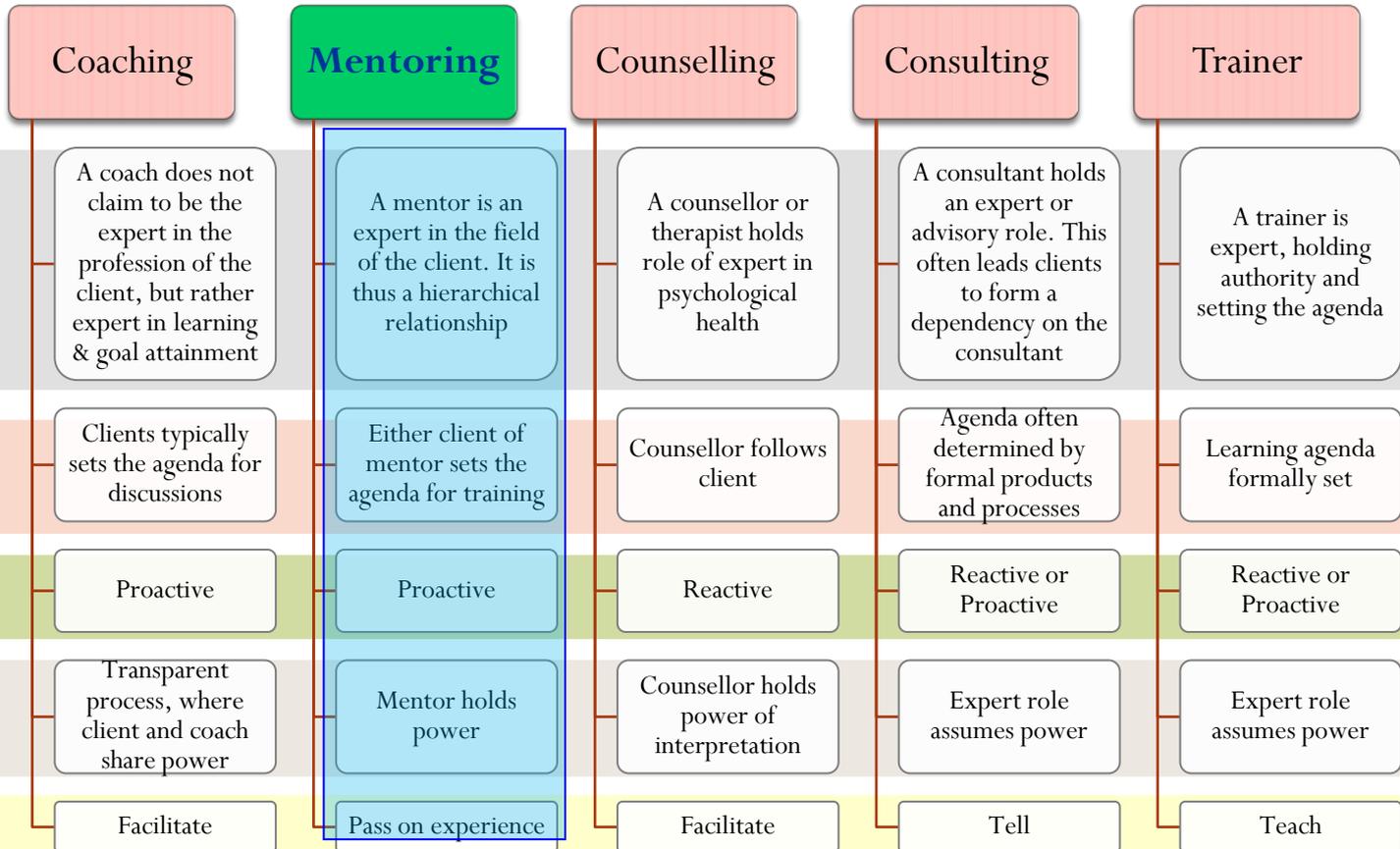
Mentee

Mentee is a new entrant to the profession undergoing mentoring process

Client/Employer

Training placement provider

Differentiating

	Coaching	Mentoring	Counselling	Consulting	Trainer
Expertise	A coach does not claim to be the expert in the profession of the client, but rather expert in learning & goal attainment	A mentor is an expert in the field of the client. It is thus a hierarchical relationship	A counsellor or therapist holds role of expert in psychological health	A consultant holds an expert or advisory role. This often leads clients to form a dependency on the consultant	A trainer is expert, holding authority and setting the agenda
Who sets agenda	Clients typically sets the agenda for discussions	Either client of mentor sets the agenda for training	Counsellor follows client	Agenda often determined by formal products and processes	Learning agenda formally set
Proactive / Reactive	Proactive	Proactive	Reactive	Reactive or Proactive	Reactive or Proactive
Power	Transparent process, where client and coach share power	Mentor holds power	Counsellor holds power of interpretation	Expert role assumes power	Expert role assumes power
Process	Facilitate	Pass on experience	Facilitate	Tell	Teach

Informal and Formal Mentoring

Informal

o voluntary mentoring

o arises spontaneously

o Casual occasional guidance

o difficult to study except in retrospect

o length of informal relationships appears to be longer

Formal

o a structure to support the deliberate pairing of the more skilled and experienced person with the less skilled/experienced person

o Structured with written records of goals, objectives and achievements

o involves planning & some negotiation between the participants about appropriate mentor roles

PREPARING FOR MENTORING:

- Develop the most appropriate structure for your mentoring process

- Obtain background information about your mentee's learning objectives

- Clarify your objectives/expectations: know what you can and are willing to offer and what you hope to achieve

- Be clear about other parties that are involved, their role and how you will interact with mentee

- Prepare for the first meeting

AGREE on the following:

- Meeting times: duration, regularity, place, notice, what happens out of meetings within the workplace

- Confidentiality: nothing disclosed without permission

Method of mentoring

- Direct one to one engagement
- Online mentoring
- Webnar

Role of Mentors

Mentor Attributes

- Good Listeners
- Open and Honest
- The ability to perceive what the mentee needs
- Effective confrontation techniques
- Conflict resolution
- Keep mentee focused on the plan

MENTORING PROGRAMME

A series of mentoring sessions over time

Time / number depends on goals & mentee's readiness/ability for learning

Begin with the end in mind

1. INTAKE SESSION

2. EXPLORING GOALS

3. AGREEING GOALS

4. MENTORING SESSION

5. REVIEW SESSION

6. SESSION

7. SESSION

8. CLOSE

MAINTAIN MOMENTUM

- Have regular meetings
- Keep a log of sessions
- Ask for feedback and be willing to change and to learn
- Do what you promised you would do
- Have high expectations of the mentee (and of yourself as a mentor!)
- Wherever possible keep communication open with their line manager and involve them (without breaking confidences with the mentee)

When a Performance Gap is Recognized…

- ❑ Should come up with positive, constructive strategies to overcome
- ❑ Use wisdom and timing, to choose when to confront
- ❑ Mentors should avoid:
  - Criticizing
  - Repetition of Shortcomings
  - "Absolute" statements - You are 'always' or 'never' something
  - Letting mentee learn by trial and error for too long
  - Letting personal friendship clog the mentoring path

THINGS THAT COULD HINDER MENTORING

Mentor	Mentee	Organisational
• Too directive • Arrogant • Power issues • No confidentiality • Not mature or experienced enough • Not ready to share experience • Poor communication	• Too defensive • Unclear about goals • Dependent • Power issues • Confidentiality • Unwilling to learn • Unclear expectations • Poor communication	• Unclear expectations • Lack of reward or recognition • No time or resource support • Poor communication • Poor relationships • Chain of command

QUESTIONING

Build question frameworks

Asking insightful questions

- Questions that challenge thinking
- Questions that provide another perspective
- Questions that open up possibilities
- Questions that haven't been thought of…

THE RIGHT QUESTION AT THE RIGHT TIME

Who, what, where, when, how……
Avoid "why" questions (Why?)
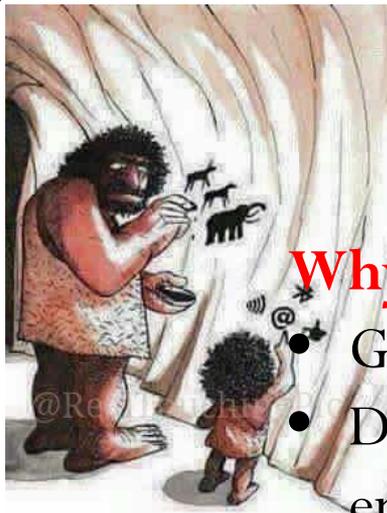
The old dog can still learn new tricks
or learn about a changed world…

Why should one be a Mentor

- Gain personal satisfaction through doing something worthwhile
- Develop transferable skills that are directly relevant to your engagement as facilitator and trainer
- Gain opportunities to work with people from other backgrounds and cultures
- Promote ERB/SEAP, enhance its image and help develop its future
- Be role model and build legacy
- Addition of educational extra-curricular activities on your CV

EXERCISE

Develop at least 4 questions which could help your mentee:

- Develop their goals/outcomes
- Understand their current reality
- Explore their options
- Decide on their actions to achieve their goals

PART II: Report Writing for Engineers

- Forms and importance of written communication in business

- Types, qualities, structure and style of good report

- Report writing process

- Basic tools for improving writing skills

Engineering Report Writing

A well written report conveys intended information to targeted audience in a concise, attractive to read, logical, good flow and inspires the reader

1) Types of Engineering Reports

Report can be from various sources:

- Results of investigations, research, analysis of engineering problem, training scheme, etc

- Record of engineering events, e.g., feasibility studies, designs, construction, commissioning, manufacturing, tests, etc.

2) Target Audience

- Clients from Government, Corporations or private entities
- Regulatory Authorities, e.g., PPRA, ERB, AQRB, CRB, IET, etc

3) Objectives of Engineering Report to ERB

- To show that a formal Training Mentoring Programme was followed
- To show inputs of mentors and mentees

3) Objectives of Engineering Report to ERB (contd...)

To demonstrate that the mentee has acquired the following:

- Technical skills in analysis and design
- Management skills to execute engineering projects
- Economical touch in solutions
- Professional use of codes and manuals
- Right communication skills, i.e., draft drawings and professional report writing
- Professional code of ethics and work attitude
- Leadership and reliability for the professional level
- Fit and proper person to be awarded the recognition of a PE status
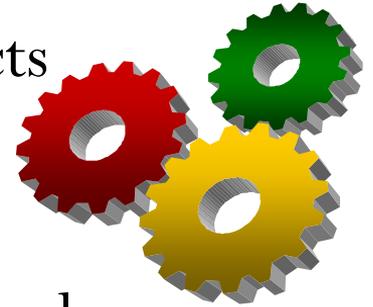
4) General Structure of a Report

<u>Title Page:</u> Short but concise to reader to focus on the topic

<u>Summary:</u> A short report summarizing important features of the report, any tangible results and conclusions

<u>Acronyms:</u> A list of abbreviations or shortenings of names/titles

<u>Contents:</u> Number and list of sections, subsections and corresponding page numbers

<u>Introduction:</u> Show the objectives of the report and comments on how the topic is being treated

4) General Structure of a Report

<u>Sections:</u> Pieces of different ideas formed into a section

<u>Conclusions:</u> Showing summing up of findings of your report and recommendations

References: Any useful material, data, books, papers referred to

<u>Acknowledgement:</u> List of those who helped you conduct investigations, design or tests in your report

<u>Annexures/Appendices:</u> Data printouts included for closer reference

5) Competences of report writer

- Good command of communication language

- Good knowledge of the subject matter by training, experience and mentorship

- Good appreciation of the targeted audience (e.g. senior engineering professionals) and what they seek from the report

- Good focus on the message of the report in a logical, concise and short interesting presentation

6) Steps of writing the report

a) **Planning the report**

- Collect information randomly and keep accurate record of sources in report file

- Write down topics and ideas randomly as they come to capture different aspects of ideas you want to convey

- Structure your report logically later

b) **First Draft**

- Determine your audience and keep details and complexity to match

6) Steps of writing the report (contd..)

c) **Revise first draft**

- As report take shape as a professional document, revise it to focus clearly to convey intended message to 'target readership'

d) **Diagrams, graphs, tables and mathematical derivations**

- Use simple diagrams/graphs

- Use tables where necessary

- Use mathematical presentations if only they are an efficient way to communicate otherwise throw these into the appendices

6) Steps of writing the report (contd..)

e) **Report layout**

- Good appearance is important

- Ensure proper presentation by formatting (use of std 12 pts same font)

f) **Headings**

- Properly label your headings and their approprite subheadings, label tables to corresponding to main headings

6) Steps of writing the report (contd..)

g) **Proof reading**

- A must do and may use a colleague to help

- Always ensure that you convey what you **think you now know**

h) **Presentation**

- Focus on the needs of targeted readership but be smart and attractive

- Direct your presentation style to appropriate needs of target audiences

PART III Ethics and Professional Conduct in Engineering

- Ethical Principles

- Ethics and codes of professional conduct

- The engineers and society

Ethics, Morals, and the Law

- ❏ Morals

  Principles of right and wrong

- ❏ Ethics

  - A set of moral principles guiding behavior and action

- ❏ Laws

  - _Binding_ codes of conduct; formally recognized and enforced

  - Company Policies

Classification of Actions:
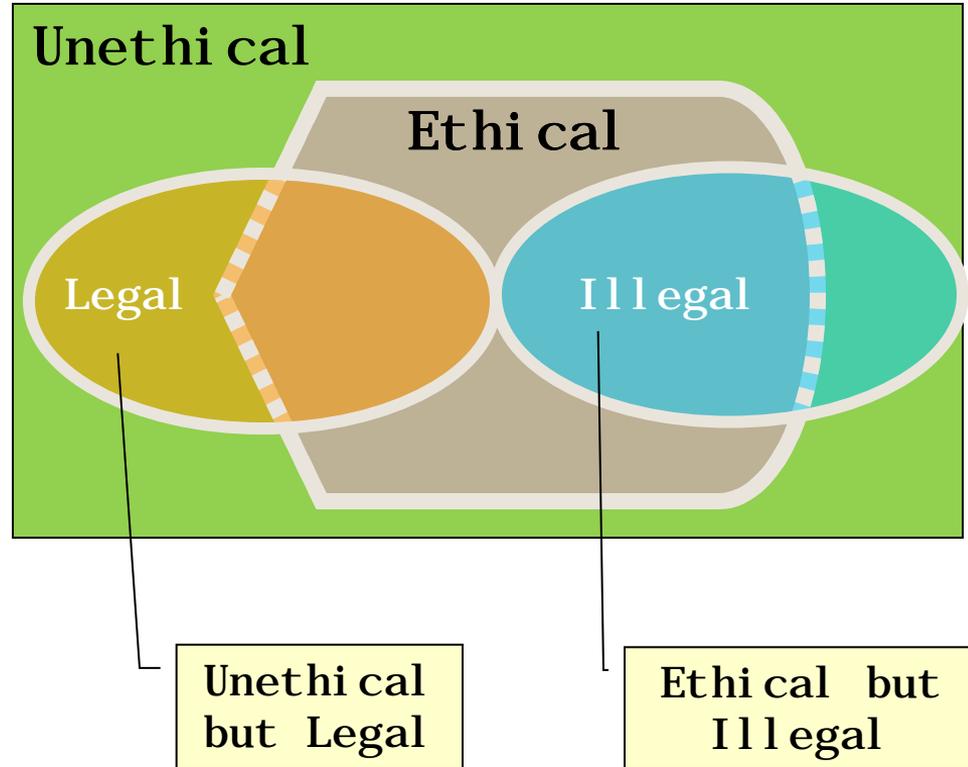
Differences (Principles):

Personal ethics is a foundation of professional ethics
There is a difference between professional ethics and personal ethics

Personal Ethics	_Morality_	_Professional Ethics_
• _Personal Ethics_ is the set of ones own ethical commitments.	▪ Refers only to personal behavior ▪ Refers to any aspect of human action ▪ Social conventions about right or wrong conduct.	• Involves defining, analyzing, evaluating and resolving moral problems and developing moral criteria to guide human behavior. • Critical reflection on what one does and why one does it. • Refers only to professional behavior

Two Dimensions of Ethics in Engineering

Ethics is part of engineering for two main reasons.

a) Engineers need to be **socially responsible** when building products and processes for society.

b) Social responsibility requires **professional responsibility**.

ABET Says . . . By the time of graduation students will have an understanding of professional and ethical responsibility

Ethics and Engineering

Where the ethical issues can arise:

- Conceptualization, Design, Testing, Manufacturing, Sales, Service
- Supervision and Project Teams
  - Project timelines and budgets
  - Expectations, opinions, or judgments
- Products: Unsafe or Less than Useful
  - Designed for obsolescence
  - Inferior materials or components
  - Unforeseen harmful effects to society
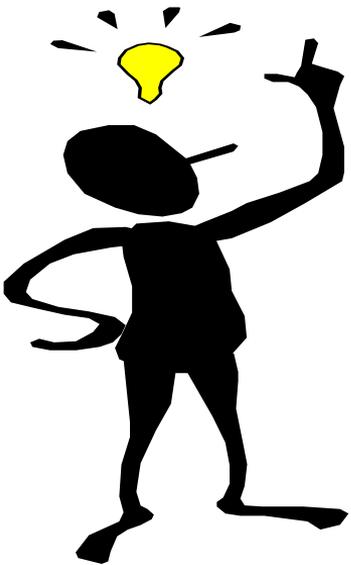
Ethics and Engineering
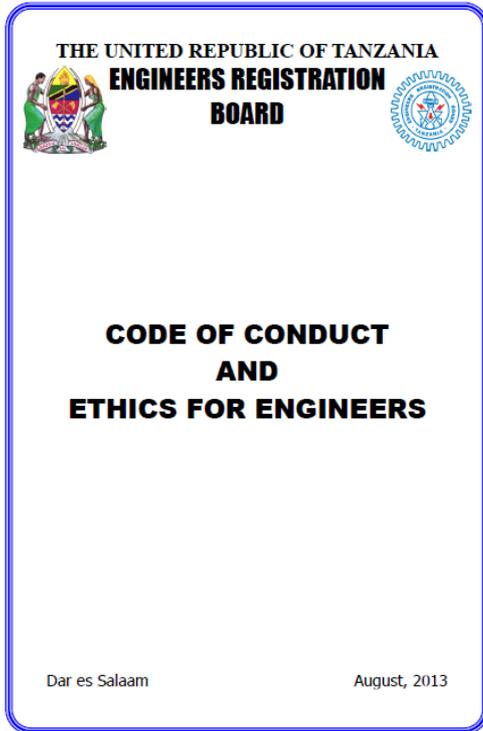
Impacts of an engineer's ethical decisions:

- The Products & Services (safety and utility)
- The Company and its Stockholders
- The Public and Society (benefits to the people)
- Environment (Earth and beyond - PPP)
- The Profession (how the public views it)
- The Law (how legislation affects the profession and industry)
- Personal Position (job, internal moral conflict)

Ethics and Engineering

Typically, good ethical decisions…

- …may be just that: "good," but rarely "great" or "ideal"
- …will not always be in the best interest (irrespective of the timeline) of all stakeholders
- …are not automatic but require thought, consideration, evaluation, and communication (much like the "design process")

Ethics:

THE UNITED REPUBLIC OF TANZANIA
ENGINEERS REGISTRATION BOARD

**CODE OF CONDUCT
AND
ETHICS FOR ENGINEERS**

Dar es Salaam   August, 2013

Shows what you have to consider when making decisions

- **Engineering Ethics**: is about
  - how we have to act and live <u>as an engineer</u>,
  - what we have to consider when making decisions,
  - aaccording to <u>what standards</u> are these <u>actions right or wrong</u>.

  Shortly Engineering ethics is how engineers morally act as an Engineer. This is professional ethics NOT personal ethics. code of conduct (1).pdf

Typical Ethical Issues that Engineers Encounter

- Safety
- Acceptable risk
- Compliance
- Confidentiality
- Environmental health
- Data integrity

- Conflict of interest
- Honesty/Dishonesty
- Societal impact
- Fairness
- Accounting for uncertainty, etc.

Note!

By themselves, character and integrity do not accomplish anything. But their absence faults everything else…

Peter Drucker

The Engineering Profession

How we view ourselves:

- Problem-solvers
- Engineering is enjoyable; *esprit de corps*
- Engineering benefits people, provides a public service
- Engineering provides the most freedom of all professions (Florman, 1976)
- Engineering is an honorable profession

REMEMBER!!!

- You are professional

- You are a member of a profession that has many worthy accomplishments

- You and your profession can do much to help to improve the quality of life

- Be a an exemplary mentor and a hero to your mentees

Thank you for listening!

"Those having torches will pass them on to others."

PLATO

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