Global Code of Ethics for Science and Engineering

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Introduction

1. Normative ethical research

2. Descriptive ethical research

3. Values to be involved in global code of ethics

Normative Ethical Research

◆**Analysis of existing code of ethics**

➢literature search

➢analysis of existing code of ethics

◆**Examination of new "values"**

➢examination of Asian values

Common Values

◆ positive duties regarding mutual support, loyalty, and reciprocity

◆ negative duties to refrain from harmful actions

◆ norms for rudimentary fairness and procedural justice

Bok, Sissela, *Common Values*, University of Missouri Press, 1995, p.13.

Harris, Charles E. Jr., "Internationalizing Professional Codes in Engineering," *Science and Engineering Ethics*, Vol.10–3, 2004, pp. 509-10.

Basic Principles by Unger

1	truth, honesty, trustworthiness
2	respect for human life and welfare, including that of posterity
3	fair play
4	openness
5	competence

Stephen H. Unger, "Code of Engineering Ethics", Deborah G. Johnson (ed)., *Ethical Issues in Engineering* (excerpt from Stephen H. Unger, *Controlling Technology: Ethics and the Responsible Engineer,* Holt Rinehart and Winston, 1982), p. 107.

Themes Presented by Luegenbiel

1	public safety	7	human rights
2	competence	8	rights of engineers
3	honesty and objectivity	9	intellectual property
4	avoidance of conflicts of interest	10	preservation of the natural environment
5	confidentiality	11	concern for the implications of technology
6	making decisions that are fair and merit-based	12	public role for engineers

Heinz C. Luegenbiehl, "Themes for an International Code of Ethics of Engineering Ethics", *Proceeding of the 2003 ASEE/WFEO International Colloquium*, 2003

World Federation of Engineering Organizations

sustainable development and the environment

protection of the public and the environment

faithful agent of clients and employers

competence and knowledge

fairness and integrity in the workplace

professional accountability and leadership

http://www.unesco.org/wfeo/ethics.html#12

North American Free Trade Agreement

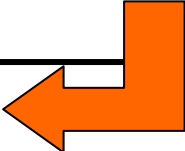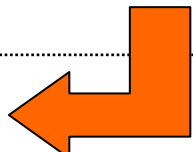| |
|---|
| truth, honesty, and trustworthiness |
| fairness, courtesy and good faith toward clients, colleagues and others |
| health, safety and welfare of public (hold paramount) |
| competence |
| examine the societal and environmental impact of actions and projects |

http://www.niee.org/Nafta_Report.htm

Themes Presented by Luegenbiel (again)

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Core Values

- honesty, truth, trustworthy
- fairness
- openness (accountability, disclose all relevant information)
- competence
- confidentiality
- public safety, health, welfare
- faithful agent of clients and employers

Analysis of Existing International COE

◆**Classification of values**

➢Micro level

➢Meso level

➢Macro level

●Conduct and Ethics in Engineering Practice Related to the North American Free Trade Agreement

●The WFEO Model Code of Ethics

●FEANI Code of Conduct

●Asian Engineers' Guideline of Engineer

Values in Existing International COE

Micro level (values to be respected as individual)	
core	honesty, truth, trustworthy
	fairness
	openness (accountability, disclose all relevant information)

Values in Existing International COE

Meso level (values to be respected as professional	
core	competence
	confidentiality
	public safety, health, welfare
	faithful agent of clients and employers

Values in Existing International COE

Meso level (values to be respected as professional)	
professional	professional development (continuing competence)
	professional dignity
	professional integrity
	whistle blowing in the public interest
	intellectual property
	quality of product

Values in Existing International COE

Macro level (values to be respected for society and environment)	
environment	sustainable development and environment
	humankind's continued existence
	benefit and welfare of mankind

Values in Existing International COE

Macro level (values to be respected for society and environment)	
impact	conscious of the importance of science and technology for mankind
	societal and environmental consequences of actions or projects
	assess all the impacts

Values in Existing International COE

Macro level (values to be respected for society and environment)	
public role	public interest / public roll
tolerance	local system of values
	traditional and cultural values

Analysis of Existing Japanese COE

◆ Survey by Science Council of Japan (2005)

➢ 54 Japanese academies

Values in Existing Japanese COE

care for social impact
social responsibility/society/user/impact/others (others・other companies・other fields・other job title)/mankind/public/

Values in Existing Japanese COE

accountability
official announcement/public information/release/publicity/information supplement/disclosure/explanation/description/clear indication/outgoing correspondence/publication/assertion/report/record/clear notification

Values in Existing Japanese COE

concrete contents of social impact
risk/harm/disbenefit/disadvantage/danger/burden /pain/harmful/accidental/invasion/casualty/health damage/life/safety/property/peace of mind/health

Values in Existing Japanese COE

rights (of test subjects etc.)
human rights/personality/privacy/dignity/right of self-determination/individual information/anonymity/will/wish

Values in Existing Japanese COE

fairness
honest/conscience/faithful/equity/justness/rightness/pertinence/bona fides

Values in Existing Japanese COE

moral・compliance
law/moral/norm/rule/institution/regulation/declaration/byelaw/canon/guideline/agreement/common sense/humanity/principle

Values in Existing Japanese COE

improvement and keeping in the quality of research (and/or researcher)
competence/improvement/education/training/acquirement/lucubration/nourishmen/induction course/guidance/supervision/accession/cultivation/enlightenment/learning from experience

Values in Existing Japanese COE

consensus・consent
contract/agreement/comprehension/expression of intention/acknowledgement/acceptance

Values in Existing Japanese COE

treatment of intellectual effort
intellectual property/intellectual product/patent/copyright

Values in Existing Japanese COE

matters concerning information management
confidential/use for purposes other than the original intent/leakage

Values in Existing Japanese COE

guarantee of objectivity of fact and data
validity/grounds

Values in Existing Japanese COE

acceptance of diversity (of research)
multiplicity/reciprocal/exchange of opinions・information

Values in Existing Japanese COE

not otherwise classified
happiness/welfare/benefit/health/well-being/peace/responsibility/commitment/evaluation/deliberation/examen/colloquy/earth/environment/nature

Examination of New Values

◆Examination of Asian values

➢Mottainai

⬇

"Mottainai is not just about material loss, but also about the sense of respect and compassion for the story behind every material objects."

Planet Link (ed.), *Mottainai*, Magazine House, 2005, p.9.

(Japanese-English parallel translation)

➢harmony

Asian Values

Asian values	
"Mottainai"	the lowest possible consumption of raw materials and energy (WFEO)
	the lowest production of wastes and any kind of pollution (WFEO)

Asian Values

Asian values	
Harmony	harmonious living with neighboring people and nature (Asian)
	inter-relational harmony (WFEO)
	collaboration of appropriate experts (FEANI)
	solidarity (among Asian engineers) (Asian)
	oppose prejudice and discriminative treatment (Asian)

1. Normative ethical research

2. Descriptive ethical research

3. Values to be involved in global code of ethics

Survey of Values

◆ **Delphi method**

➤ based on a structured process for collecting and distilling knowledge from a group of experts by means of a series of questionnaires interspersed with controlled opinion feedback

Samantha Pang, "The Delphi Method –theoretical, methodological, and practical considerations", Second International Workshop on "The Formation of Ethics Crossroads and the Constitution of Science and Engineering Ethics", 2006.

Survey of Values

◆**International Comparative Survey of Values in Science and Engineering -First Round-**

   ➢Identify the experts
   - mailing list (ECTM, JSEE, etc.)
   - Global Ethics Observatory, UNESCO

   ➢Send a questionnaire

Survey of Values

◆**Send a questionnaire**

➢ <u>Question</u>: How do you think that when a scientist and an engineer make decisions what do they think as important? (For example, values, principles, and/or behaviors that scientists and engineers think as important.)

➢ <u>Question</u>: How do you think that when a scientist and an engineer make decisions what they should think most important? (For example, values, principles, and/or behaviors that scientists and engineers should think as most important.)

Survey of Values -First Round-

◆responses from 47 people in 17 countries

◆Our research center's analysis first derived the values that can be seen directly in the responses.

  ➢33 values

◆Next, among the responses were some values not directly apparent, but are embedded values; we have clarified them.

  ➢7 values

◆Total of 40 values

Survey of Values -First Round-

1. accuracy（precision, low uncertainty, etc.）
2. accountability
3. autonomy
4. benefit of others
5. competency and skill（professional competence, thorough knowledge and evaluation of existing research and good practice in the problem area, etc.）
6. career
7. creativity（developing new values, originality & ingenuity, creating new technology, uniqueness etc.）
8. curiosity（interest, inquisitiveness, etc.）

Survey of Values -First Round-

9. dignity

10. economic efficiency（profit, cost, financial aspects, high level management sense, etc.）

11. efficiency

12. elegance

13. equity

14. ethical awareness（understanding relevant ethical/social/legal actions, etc.）

15. feasibility

16. justice

17. moral responsibility（ethical conduct, moral values, etc.）

18. objectivity

Survey of Values -First Round-

20. precautionary principle

21. prestige（personal success, self assessment, etc.）

22. respect of others（respect of others [other people, other cultures, other religions, animals and nature, and including humankind's future, society's future, environmental future], etc.）

23. professional responsibility

24. public benefit（human benefit, benefit of others, etc.）

25. religious values（e.g. Islamic religion）++We would not limit this to Islamic only++

26. safety

27. subjective judgment towards risk, relief, rest, ease

Survey of Values   -First Round-

28. scientific knowledge（scientific principles, scientific evidence, espistemological values, etc.）

29. sustainability

30. technical solution

31. truth

32. truthfulness

33. usefulness

Survey of Values -First Round-

34. cooperation（consultation with elders and other experienced specialists, etc.）

35. cultural diversity（global perspective, one's own culture & international standards, importance of every culture, etc.）

36. culture and/or principle of organization（scientific community's code of conduct, corporate culture, academic assessment, enhancement of corporate value, advancement of one's corporation and organization, etc.）

Survey of Values -First Round-

37. contribution to society（human health and safety, world peace, scholarship and knowledge specifically to contribute to society's welfare, knowledge/country/humanity contribution, spread of social success, building safety/safe society, etc.）

38. dialogue with public

39. social impact（societal consequences, science & technology's purpose, environmental care, public acceptance, social impact, support from society, etc.）

40. welfare of mankind（continuous improvement of human knowledge and life, solving serious human problems-for example, global epidemics and malnutrition, etc.）

Survey of Values   -Second Round-

◆questionnaire

➢Question: How important do you think these 40 values are to scientists and engineers? Please select a level. Level 0 (not important to scientists/engineers) ~ 4 (absolutely necessary to scientists/engineers)

➢Question: Among these 40 values, which to you think are especially important? Please select at least 5 values that you think should be included in a code of ethics or guideline. (Please enter the number of the values above.)

Survey of Values -Second Round-

1. accuracy	3.61
2. accountability	3.61
3. autonomy	3.23
4. benefit of others	2.69
5. competency and skill	3.69
6. career	2.76
7. creativity	3.38
8. curiosity	3.61
9. dignity	2.61
10. economic efficiency	2.61

responses from 13 people in 6 countries

Survey of Values -Second Round-

11. efficiency	3.00
12. elegance	2.15
13. equity	3.00
14. ethical awareness	3.38
15. feasibility	2.84
16. justice	3.07
17. moral responsibility	3.69
18. objectivity	3.53
19. perseverance	3.61
20. precautionary principle	3.00

responses from 13 people in 6 countries

Survey of Values   -Second Round-

21. prestige	2.30
22. respect of others	3.23
23. professional responsibility	3.92
24. public benefit	3.38
25. religious values	1.92
26. safety	3.46
27. subjective judgment towards risk	2.69
28. scientific knowledge	3.61
29. sustainability	3.23
30. technical solution	3.07

responses from 13 people in 6 countries

Survey of Values -Second Round-

31. truth	3.46
32. truthfulness	3.84
33. usefulness	2.69
34. cooperation	3.15
35. cultural diversity	3.07
36. culture and/or principle of organization	2.84
37. contribution to society	3.23
38. dialogue with public	3.00
39. social impact	3.23
40. welfare of mankind	3.07

responses from 13 people in 6 countries

Survey of Values -in Korea-

1. accuracy	3.71
2. accountability	3.17
3. autonomy	2.82
4. benefit of others	2.69
5. competency and skill	3.35
6. career	3.17
7. creativity	3.59
8. curiosity	3.12
9. dignity	2.41
10. economic efficiency	3.15

responses from 39 people in Korea

Survey of Values   -in Korea-

11. efficiency	3.00
12. elegance	2.35
13. equity	2.74
14. ethical awareness	2.92
15. feasibility	3.00
16. justice	2.79
17. moral responsibility	3.17
18. objectivity	3.12
19. perseverance	2.71
20. precautionary principle	2.74

responses from 39 people in Korea

Survey of Values   -in Korea-

21. prestige	2.23
22. respect of others	2.71
23. professional responsibility	3.56
24. public benefit	3.30
25. religious values	1.43
26. safety	3.43
27. subjective judgment towards risk	2.51
28. scientific knowledge	3.10
29. sustainability	2.94
30. technical solution	3.33

responses from 39 people in Korea

Survey of Values -in Korea-

31. truth	3.20
32. truthfulness	3.10
33. usefulness	3.05
34. cooperation	2.94
35. cultural diversity	2.30
36. culture and/or principle of organization	2.28
37. contribution to society	2.82
38. dialogue with public	2.35
39. social impact	2.64
40. welfare of mankind	3.00

responses from 39 people in Korea

Survey of Values -Second Round-

◆Our survey

➢23 professional responsibility: 3.92

➢32 truthfulness: 3.84

➢5 competency and skill: 3.69

➢17 moral responsibility: 3.69

◆Survey in Korea

➢1 accuracy: 3.71

➢7 creativity: 3.59

➢23 professional responsibility: 3.56

➢26 safety: 3.43

Survey of Values -Second Round-

◆Our survey

➢17 moral responsibility (7)

➢23 professional responsibility (7)

➢14 ethical awareness (5)

➢32 truthfulness (5)

◆Survey in Korea

➢23 professional responsibility (28)

➢1 accuracy (26)

➢7 creativity (25)

1. Normative ethical research

2. Descriptive ethical research

3. Values to be involved in global code of ethics

Micro Level

◆ Values to be respected as individual

➢ Core values

- honesty, truth, trustworthy
- fairness
- openness (accountability, disclose all relevant information)

➢ Values to be considered

- autonomy
- dignity
- elegance

Meso Level

◆**values to be respected as professional**

➢core values
  - competence
  - public safety, health, welfare
  - faithful agent of clients and employers

➢professional responsibility
  - professional development (continuing competence)
  - professional dignity
  - intellectual property
  - accuracy
  - objectivity

Macro Level

◆**values to be respected for society and environment**

➢environment

- sustainability
- earth, nature
- Mottainai

➢social impact

- conscious of the importance of science and technology for mankind
- societal and environmental consequences of actions or projects
- assess all the impacts
- risk

Macro Level

◆**values to be respected for society and environment**

➢public role

- consensus, consent
- dialog with public
- contribution to society
- welfare of mankind

➢rights

- human rights
- privacy, individual information

New Values

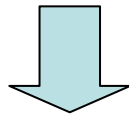◆**values to be considered as Asian values**

➢tolerance

- local system of values
- traditional and cultural values
- cultural diversity
- respect of others

➢harmony

- harmonious living with neighboring people and nature
- inter-relational harmony
- collaboration
- oppose prejudice and discriminative treatment

Global Code of Ethics

◆We need a <u>platform</u> that can be used for engineering practice and engineering education in any area.

continual cross-cultural dialog

open dialog other than expert group

Thank you very much for your patience