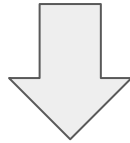# A Framework for Information Security Ethics Education

Introduction

- The internet has enormous impact on the society
- Big potential for misuse and abuse (hacking, spam, DOS, identity theft)
- The ubiquity and openness of the Web requires self-governance

Ethical Framework is needed

The ultimate goal of the authors is to have a positive influence on the ethical development of students in information security programs.

The Framework

1.Ethical Dimension:

The ethical dimension considers the ethical implications of a given information security topic. Ethical implications are explored from various perspectives to have relevance for individuals, as well as groups of individuals and society at large.

2. Security Dimension:

The security dimension focuses on ways in which a topic manifests itself to information security professionals and others who have a vested interest in information security. The security dimension includes a discussion of weaknesses in the information infrastructure.

The Framework

3. Solution Dimension:

The solutions dimension focuses on remedies that individuals, groups of individuals and society have created to address the ethical and security problems inherent in a topic. Technical Solution, legal solution, professional solution, cultural solution.

4. The personal moral development solution:

Includes introspection into one's personal beliefs in relation to this particular topic. How can students with different backgrounds in ethics and technology relate a particular topic (e.g., software piracy) to their own evolving moral values and development?

The Framework

The pedagogical approaches:

The framework‟s dimensions cover the basic content for lectures and classroom discussions relating to topics in information security ethics. The emphasis on the pedagogical approaches is to present creative and constructive learning experiences for students in various kinds of courses that address information security ethics issues.

3. The Four Dimensions

1. Ethical
2. Security
3. Solution
4. Moral Development

The Ethical Dimension

- Explores the ethical ramifications of a topic from a variety of perspectives
- Questions raised:
  - What are the implications of this topic for individuals, particular groups of individuals, and society at large?
  - What ethical dilemmas arise in discussion of this topic?
  - How do evolving technologies impact the way that individuals, groups, and society perceive the ethical issues surrounding this topic?
- Examining three theories:
  - virtue ethics (agent-centered approach, emphasizes the motivation for an action more than with the action itself)
  - utilitarianism (a consequence centered approach, emphasizes the ultimate outcome of an action whose worth is based upon the net total of "good" that it produces regardless of the motive)
  - deontological ethics (in order to act in an ethical manner, a person must take action for the sake of fulfilling an obligation)

The Security Dimension

- Observes ways in which the topic manifests to information security professionals and others who have a vested interest in information security
- Usefulness of information and communication technologies to society is challenged by the prevalence of vulnerabilities in these technologies
- Benefits of easy access to information via Internet have to be balanced against violations of privacy and intellectual property enabled by the Internet
- Examples/ Questions raised:
  - Is it ethical to send unsolicited email? When is it ethical to send anonymous mail? What are the ethical guidelines and what is the etiquette for exchanging email? Is it ethical to distribute or use personal information that belongs to other people?
  - Is Internet vigilantism justified under any ethical framework?
  - Ethically speaking, what minimum level of privacy protection should an organization provide irrespective of cost?
  - What steps can be taken to protect freedom of speech while discouraging disinformation?

The Solutions Dimension

- Focuses on remedies that individuals, groups of individuals and society have created to address security problems and associated ethical dilemmas
- Questions raised:
  - What is legal? What is ethical? Where do legal solutions address ethical issues and where do they fall short? What is unique about legal issues and ethics in information security?
- Perspectives:
  - **legal**: addresses relevant laws and regulations must be studied.
  - **professional**: addresses professional expectations and codes of ethics for information security
  - **cultural**: addresses how cultural factors can shape ethical behavior
  - **technological**: addresses how technology is used as a means of addressing information security ethical issues and enforcing solutions

The Moral Development Dimension

- Goal: Explore, explain, defend, question, deconstruct, and redefine their personal beliefs of right and wrong against the backdrop of the first three dimensions
- describes the stages and transitions that humans experience as they develop morally, as they develop their own personal beliefs and behaviors about right and wrong
- Questions raised:
  - "who am I now" in relation to:
    - technical, professional, cultural, and legal solutions
    - to these ethical and security issues, and asks questions such as "what is the relationship between who I am, who I want to be, and these issues and solutions"?

Technical

Legal

Professional

Cultural
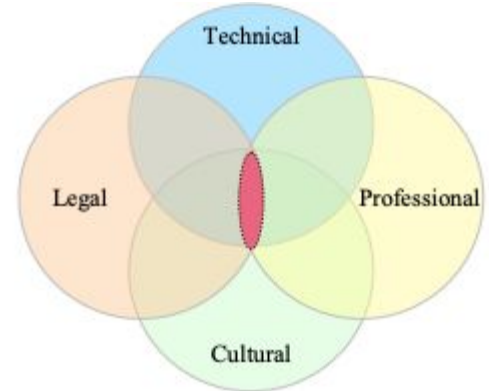
4. Pedagogical Approaches

The Challenge of teaching information security ethics:

- The teaching of facts, concepts and principles is based on a transfer of existing knowledge
- the development of ethical and moral beliefs includes cognitive, affective and social components.
    - ➔ individuals who are challenged with teaching information security ethics will find themselves faced with needing to teach differently

4. Pedagogical Approaches

Suitable learning activities:

- Constructivism: is about searching for meaning, where meaning is derived from experience, and experience is the result of continuous active
  - ➔ The learning process focuses on concepts and not on unconnected facts
  - ➔ Creation of new models by linking existing concepts and the corresponding experience
  - ➔ Teachers must offer students opportunities to experience, interact, reflect, and explore their inner principles and their behaviour voluntarily and through their own conviction.

4. Pedagogical Approaches

Learning activities by using a constructivist approach:

- Have the students write an ethical cyberwill
- Have the students write a code of ethics
- Use improvisation and role playing
- Create video enactments of ethical situations
- Explore the use of defensive tools
- Set up a trial by jury situation
- Develop a criminal code for particular security offenses
- Have students write and present a speech to be presented before a Congressional committee
- Fill (or fix) a policy vacuum

5. A Detailed Example

Case:

- A student hacker has broken into a university computer system that contains confidential personnel records and financial data
- He claims that he did this to prove that the system was not hacker-proof, and that it was "just a prank"
- Steven gained access to confidential personnel records and financial data by hacking into the Provost"s computer
- It was determined that the Provost failed to comply with the university computer security policy that requires logging off every night

5. A Detailed Example

Ethical Dimension

- **Utilitarian point of view (Consequences):** In this particular example, there are no apparent direct consequences for university employees since the personnel records were not actually breached
- **Deontological ethics (is hacking intrinsically right or wrong?):** it can also be asked the reactions they would have regarding the „rightness" or „wrongness" of the issue if Steve had hacked into a child pornography site or into the site of a spammer
- **Virtue ethics (Motive):** If Steven were a white hat hacker and his motives were to purposefully identify vulnerabilities in systems, would the act be ethical?

5. A Detailed Example

Security Dimension

- The goal is to create a discussion environment in which students are able to understand and internalize the ethical responsibilities of the network security administrator.
- Should the admin or she spend time trying to remove the vulnerability since Steven"s exploit did not result in a breach of confidentiality?
- Perhaps Steven"s recommendations are not trustworthy
- Should a company be hired to do a penetration test of all of the school"s computer systems?

5. A Detailed Example

Solutions Dimension

- Did Steven break any laws?
- Should the university create a policy on hacking?
- If Steven had not broken a law, a policy, or a code of conduct, is his action ethical?
- The Provost has broken a policy. What should the consequences be for her violation?

5. A Detailed Example

Moral Development Dimension

- The hope is that students will engage in a dialog about the existence (or non-existence) of an ethical principle regardless of whether or not there is a policy or law
- To increase students" sensitivity to the moral issues in the case, it might be effective to have students explore their beliefs from a personal perspective
- If the personal case is placed first, students may enter the case empathizing with potential victims and ready to crucify Steven…no matter what
- If the personal case is placed later, students might empathize with Steven as a peer and be more inclined to defend him