

**Ethics
and
Technology Education**

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Ethics and Technology Education

The Issue

Today we live in an age of unparalleled change brought about by rapidly emerging technology. People throughout history have had to deal with the consequences of technological advancements. It is important that we make good choices to minimize negative social, environmental, and economic impacts of careless implementation of technology. Informed ethical decision making and proactive assessment of emerging technology is essential.

Regardless of how well intended, innovation and development of new technology have an ethical dimension. Technology itself is not capable of possessing moral or ethical qualities, but the ethical issues to be considered by the innovator include the following:

- Production of technologies that waste energy and resources.
- Production of new manufacturing processes that might inhibit employment, or might inflict suffering on some people.
- Development of an innovation that has only questionable applications.
- Introduction of technologies that raise hope, but have potential for failure and disappointment.

The ethics of various human endeavors are influenced and changed by new technologies. For example:

- Bioengineering is largely consumed with questions that have been increased by new life-preserving technologies, new cloning technologies, and new technologies for implantation.
- Rights of privacy are being continually attenuated by the emergence of new forms of surveillance and anonymity. Is it ethical to have video surveillance in public places?
- Additionally, the emergence of the Internet has added new questions regarding privacy and free speech.

Characteristics of the Issue

Sample Energy and Power Technology Ethical Issue

Challenges today such as global warming and depleting and expensive oil supplies are causing humans to supplement energy needs with alternative energy sources to make changes in lifestyle. For example, the potential for harnessing energy from tidal waves is being realized. Tapping into wave power and tidal power is becoming a real possibility in places like Alaska, California, New York, Washington, and Nova Scotia.

City leaders in San Francisco are considering giant turbines submerged in the San Francisco Bay below the Golden Gate Bridge as an alternative energy to power homes. Cecilia Vega (2006) of the *San Francisco Chronicle* described this proposal in an article titled *Tides around Golden Gate are Potential Energy Source*. City leaders hope wave and tidal power will decrease the city's dependence on oil and make San Francisco a hub for tidal power experimentation. A task force made up of environmental leaders, clean energy advocates and other experts will be formed to advise the city on the topic. "We have an imperative to do this," City Mayor Newsom said. "This is not insignificant. The imperative is global warming, the high cost of energy, the scarcity of resources."

San Francisco officials hope that turbines below the bridge will capture tidal energy from the powerful flow that circulates in and out of the mouth of the bay and would generate enough power for nearly 40,000 homes. Citizens in the San Francisco Bay area are faced with ethical questions regarding the development of emerging wave and tidal power options. These questions include:

- Where will the turbines be located?
- How large will the turbines be?
- What are the potential environmental impacts to the bay, fish, and other marine life?
- What evidence is there that existing tidal power usage, in other areas, does not harm the environment and marine life?
- Who will own the power generated from the tides?
- Who will pay to build and install the technology?
- What federal and state regulatory approvals are required to submerge turbines below the Golden Gate Bridge?

Sample Ethical Issues in Information and Communication Technology

Emerging information and communication technologies like email, cellular phones, and electronic scheduling are replacing paper systems in business, industry, and education. These emerging digital technologies are quickly changing the work environment by promising increased efficiency and lower costs of office communications. Electronic systems must be understood and used appropriately or ethical challenges can occur without our knowledge. There are ways in which the improper use of an emerging communication technology can create an ethical dilemma.

For example, email can handle a majority of correspondence. This technology is not difficult to learn how to use, is convenient, and inexpensive. However, standard mail is less vulnerable to undesirable interception than electronic mail. It is less likely that someone would be willing to open a letter than to look at an email. In other words, it is more challenging to monitor who has access to your email messages than it is to keep messages secure using regular mail in a post office. One might ask, what are the confidentiality concerns relating to the use of email?

Improper use and understanding of our emerging communication technology can create potential ethical challenges. In addressing these ethical challenges these questions need to be asked:

- Are we able to do more with less?
- Are we improving the quality of life?
- Do we truly save time and resources?

A Brief Review of the Literature

According to Kidder (2003) we all face tough choices. Sometimes we avoid these choices, other times we address them. However, we do not always decide to resolve tough choices. People who have a strong sense of vision and ethical values have the courage to stand up and make the tough choices.

A shrinking world and technological progress, argues Kidder, means that problems are increasingly global and demand solutions that presuppose a framework of values acceptable everywhere. Kidder

(2003) compiled eight vital values—love, truthfulness, fairness, freedom, unity, tolerance, responsibility and respect for life. These can provide a basis for a moral code of ethics.

Harvey and Airitam (2003) contend that if you discuss the subject of ethics, you are talking about challenges. Our first challenge is knowing the right thing to do. Many people are taught the difference between right and wrong at an early age. We learn that honesty is good, lying is bad; earning is good, stealing is bad; having manners is good, and intentionally hurting others is bad. The guidelines we use in separating good from bad and right from wrong are what form the essence of our individual characters.

Contributions of Technology Education to Teaching about Ethics

Technology education can address the ethical elements of *Standards for Technological Literacy* by providing students of all ages with opportunities to develop ethical decision-making skills. Ethical decision-making strategies can be taught and opportunities for reflection can be introduced in conjunction with science, technology, engineering, and math (STEM) content.

To do this, select a real-life ethical challenge that is appropriate for the maturity and knowledge levels of the learners. By using a real-life situation, the experience can be very effective. Next consider whether or not the students have the subject matter background to deal effectively with the challenge. If not, it would be appropriate to teach that content before engaging in the challenge. Part of this process includes letting the learners discover that they need additional knowledge to make good decisions. Students learn that having the right information at the right time will help them make wise decisions about technology. This is an important part of becoming a technologically literate citizen.

References

- Arthur, J. (2003). *Education with character: The moral economy of schooling*. Routledge.
- Cornman, James, *et al* (1992). *Philosophical Problems and Arguments - An Introduction*, 4th ed., Indianapolis: Hackett.
- Harvey, E. & Airitam, S. (2002) *Ethics4Everyone*. Dallas Texas: Performance Systems Corporation.

- Hill, R. B. (Ed.) (2004) *Ethics for Citizenship in a Technological World*. 53th Yearbook of the Council on Technology Teacher Education. New York, NY: Glencoe, McGraw-Hill
(companion Website: <http://www.uga.edu/teched/ethics/>)
- MacIntyre, A (2002). *A Short History of Ethics*. Routledge.
- Kidder, R. M. (2003). *How Good People Make Tough Choices: Resolving the ethical dilemmas of ethical living*. New York: Simon and Schuster.
- Singer, P. (Ed.) (1993). *A companion to ethics*. Massachusetts: Blackwell.
- Jonas, H. (1979). *The imperative of responsibility: In search of ethics for the technological age*. Chicago: he University of. Chicago Press.
- Vega, C. M. (2006, September 19). Tides around Golden Gate are potential energy source. San Francisco Chronicle.