




Computers and Society

Evaluating the Impact of Technology

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Evaluating Technological Impact

- It can be useful to think about the ways in which technology impacts the way we live our lives.
- Most computer scientists have a pretty positive view of technology.
- Is that view justified?
- How do we defend that view to other, more skeptical points of view?

Research and scholarship on the Web

- Having so much information available on the Web is a double-edged sword.
- What are some advantages to having the Web as a research tool?
- What are some disadvantages?
- What can be done to help address these disadvantages?

Research and scholarship on the Web

- Research challenges:
 - Google ranks pages by popularity, not correctness
 - There is no external editorial control or means to challenge incorrect information.
 - Authors may have a hidden agenda or motives.

Wikipedia

- Wikipedia is the best example of the challenges these issues present.
- Wikipedia has over 15 times as many words as Encyclopedia Britannica.
- Vast coverage of a wide variety of issues.
- Worldwide group of contributors and editors providing expertise.

Advantages of Wikipedia

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 - “Wisdom of crowds”
 - Able to solicit articles on a much wider array of topics.
 - Fast editing and updating
 - Democratizes choice of topic and content.

Disadvantages of Wikipedia

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- What disadvantages does the Wikipedia approach provide?
 - Uneven coverage, emphasis on pop culture
 - Inaccuracy, poor writing
 - Hidden agendas
 - Vandalism
 - Neutral Point of View

Technology as a crutch

- Computers encourage certain behaviors by making them easier
 - Spell checking
 - Calculators
 - Garbage collection
 - cut-and-paste

Changes in thinking

- What skills are less useful due to the advent of computers?
- What ways of thinking are made easier?
- What sorts of dialogue/discussion are more common?
- What sorts are less common?

Exercise

- The ubiquity of calculators has changed the way that math is taught in school. Some would argue that it's made it more difficult for people to perform and understand arithmetic.
 - Give some advantages to incorporating calculators into an elementary school curriculum.
 - Give some disadvantages to incorporating calculators into an elementary school curriculum.
 - Should calculators be banned from elementary schools? Why?
 - Should calculators be a mandatory part of the curriculum? why?
- What about laptops?

Technology and Education

- The past generation has seen a huge push on integrating technology into education, both at the K-12 level and in college.
- Recognition that computer skills are essential to getting good jobs
- Desire to use technology to improve the educational experience.

Issues

- There are really two separate issues here:
 - Making sure that students are tech-literate
 - Incorporating computers into the teaching of other subjects

Tech Literacy

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- What does this really mean?

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- What does this really mean?
- Are there specific courses in school on computer or application usage?
- Is there an exit exam that tests students' knowledge?

Tech Literacy

- What was your computer experience like in school? What did you learn about? Did all students do this, or just those who were interested?

Tech Literacy

- What topics should all students know about?
 - Basic usage? (turning it on, using a mouse/keyboard, etc)
 - Standard applications? (Word, Web browser, Excel?)
 - Hardware/component repair?
 - Internet skills?
 - Programming?

Improving Education

- Many educators would like to figure out how to use technology to improve the educational experience.
 - Save money
 - Move beyond traditional classroom settings
 - Provide new ways to explain/discuss
- What are some examples of ways in which technology can potentially enhance the traditional educational experience?

Improving Education

- Online courses/modules
- Websites with supplementary material
- Forums/bulletin boards
- Simulations
- Interactive software
- Multimedia
- “Clickers” - instant feedback
- Email - improved access to teachers
- Online ratings
- Web sites as a resource

Potential challenges

- What are some potential challenges to integrating technology into a class? What are things you've seen go wrong?

Potential challenges

- Extra workload for teacher
- Becomes a crutch - reinforces bad habits
- Unequal access
- “Fetishisation” of technology.
- Student isolation
- Time must be devoted to learning the tools, rather than the subject matter.
- Increased plagiarism.

Exercise

- Let's suppose that USF was considering whether to implement an online CS major. Students would be able to take some or all of their classes over the web.
- For each of the following participants, give:
 - Reasons why they would be in favor of this
 - Potential concerns or stumbling blocks
 - Workarounds or methods for addressing these concerns
- Groups
 - USF administrators
 - USF faculty
 - USF students

The Neo-Luddite view

- Luddites were a group of people opposed to the Industrial Revolution in Britain
 - Used as a shorthand to refer to people opposed to technology
- neo-Luddites are modern critics of computerization, the Internet, and modern technology.

Neo-Luddite criticisms

- Computers (and automation) cause massive unemployment as jobs are replaced.
- Computers “manufacture needs” - we use them because they are there, not because they make our lives fundamentally easier.
- Computers exacerbate social inequity.
- Computers weaken communities and lead to social isolation.
- Computers separate humans from nature and destroy the environment.
- Computers strengthen government, big business, and a capitalist point of view.

Neo-Luddite criticisms

- neo-Luddites tend to see technology as a harmful, dehumanizing force.
- Computers are a particularly egregious form of technology due to their speed and flexibility.
- The core issue: what is an appropriate way of life? Does technology interfere with that?

Computers and Work

- Luddites typically oppose the modern emphasis on markets, business, consumer products, and work as a dominating force in people's lives.
- They object to the idea that the central part of people's lives is what they buy, sell, or produce.
 - This is seen as dehumanizing.
- Issue - do you believe that business and corporations are primarily harmful, beneficial, or neither?

Need for technology?

- Neo-Luddites often argue that technology does not satisfy existing needs, but instead creates new needs and then satisfies them.
- Do we, as a society (not as an individual), “need” cell phones or PDAs, or are we just “pressured” into buying them by advertising, work pressures, etc?
- Put another way, does the presence of this technology encourage us to be materialistic and put too much emphasis of “stuff”?

Humans and Nature

- Neo-Luddites often argue that technology serves to separate us from nature and the world around us.
- The ethical question here is in deciding what sort of action is the “right” one to take.
 - One that benefits or enhances man’s relationship with nature
 - One that eases someone’s life, but with an environmental cost. (think about cars here)

Unequal Benefits of Technology

- Neo-Luddites also argue that, since there is a digital divide, making society more dependent upon technology is inherently undemocratic (or elitist).
- Large businesses have more access to computing resources, and so they have a competitive advantage.
- Does technology “widen the gap”, or does “a rising tide lift all boats”?

Evaluating and Predicting

- We may not agree with the Neo-Luddite point of view, but we still need to be able to accurately judge the impact of a new technology.
- Because we can build something, does that mean we should?
- Decisions about the development of technology are typically made by:
 - Research funding agencies (government-driven)
 - Companies (market-driven)
- Is there a role for everyday people?

Example: Telemedicine

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 - Privacy/security issues
 - Licensing - monitoring out-of-state “quacks”
 - Places additional power in the hands of large hospitals - lead to the “Wal-martization” of medicine?
 - Turf protection?

Predictions

- How do we decide when to deploy or release a technology?
 - As soon as it is available?
 - Not until all of its potential uses and misuses are understood?
 - Once it's deemed "acceptably safe"?
 - Once there's a public demand for it?
- Who should make these decisions?
 - Government?
 - Industry?
 - The "marketplace"?