Impact of Computing

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Today's Plan

- This is Computer Science
- Impact of Computing
  - Positive Impacts (beneficial Effects)
  - Negative Impacts (Harmful Effects)
- The Present
  - Digital Divide
  - Crowdsourcing
- The Future

Impact of Computing (What is CS?)

https://code.org/files/computer_science_is_foundational.pdf

- Algorithmic problem-solving
- Computing and data analysis (managing, processing, visualizing and interpreting data)
- Human-computer interaction
- Modeling and simulating real-world problems
- Creating and manipulating graphics
- Programming (including game design)
- Security (including cryptography)
- Web design (illustrating principles of programming, human-computer interaction and abstraction)
- Robotics (designing and programming)
- Ethical and social issues in computing

Impacts—what does that mean?

- Impact from the **Student View**
- **Impact on people different from the student**
- **Impact on Society as a whole**

Impact of Computing in the CS Classroom *or integrated into other classes*

- Somewhat related to CSP-Explore Performance Task
  - 20-21 no longer an EXAM part but required in CSP Syllabus to investigate three computing innovations (CR-Describe a minimum of three activities addressing different computing innovations.)
    - Explain beneficial and harmful effects of at least one computing innovation on society, economy, or culture.
    - Identify the data used in at least one computing innovation and explain how the data is consumed, produced, or transformed by the given computing innovation.
    - Identify data privacy, security, or storage concerns for at least one computing innovation.

Our focus is NOT on CSP but rather on the **Impacts of Computing** as they exist **NOW**.

Most generally….Let's consider the WWW—being online

- Activities:
  - Debate Carousel
  - Taking Sides
  - Likert Scale
  - Polls (Socrative, Poll Everywhere, etc)

Activities

- **Debate Carousel:** A true false statement is given. A Debate Carousel Template is given to each participant. Each participant completes portion; templates are passed clockwise; another portion completed. Process continues until all four parts are complete. Allows students to see both sides of issues.
- **Taking Sides**: A true-false question is posed. Participants stand on one side of room if they answer true and on the other side of the room if they answer false. Usually this is followed by students sharing within small groups.
- **Likert Scale:** Similar to Taking Sides except it is not a binary choice. Students can stand between the two extremes.
- **Polls:** Can be to gather the same information as Taking Sides using a web-based tool such as Socrative.

Let's first look at the WWW-being online

- Impacts:
  - Impact from the **Student View**
  - **Impact on people different from the student**
  - **Impact on Society as a whole**
- **Positive** Impacts? (Beneficial Effects?)

Targeted Advertising

- **Benefits Of Advertising Through Social Media Include:**
  - Grow sales and your fanbase.
  - Use customer generated content for ads (which perform better, too!).
  - Better target net new and returning customers (so you waste less money).
  - Use platform analytics to determine winners.
- **Social Media Advertising 2020:**
  - Facebook.
  - Instagram.
  - Twitter.
  - Pinterest.
  - LinkedIn.
  - Snapchat.

Let's first look at the WWW-being online

- Impacts:
  - Impact from the **Student View**
  - **Impact on people different from the student**
  - **Impact on Society as a whole**
- Negative Impacts? (Harmful Effects?)

Targeted Advertising

- **"Targeted ads are one of the world's most destructive trends."**
  - Political advertisement on Social Media
    - Doctored/edited videos. (Fake News)
  - In the light on COVID-19
  - In the light of the 2020 presidential election
- **Overcoming the initial reaction requires trust: a recognition that whoever is addressing us is competent and isn't trying to manipulate us. This is why checking information is so important.**

Impact on Education-being online

- Some postsecondary educators view technology as a distraction in the classroom. Even if they don't ban the use of mobile phones or social media during class, they may begrudgingly view technology as a little more than a necessary evil.
  - **Technology affords better access to resources**
  - **Technology can improve student engagement**
  - **Technology can expand classroom boundaries**
  - **Technology can encourage self-paced learning**
  - **Technology can promote innovative teaching techniques**

Impact on Education: Digital Divide

- **Digital Divide: refers to differing access to computing devices and the Internet, based on socioeconomic, geographic, or demographic characteristics.**
  - School closures have turned a spotlight on inequities and other shortcomings
  - There is a drop in connectivity impacting rural and urban areas with populations already underserved by the medical system or racked with poverty.
    - **Between February and mid March, it is reported that there was a 10% increase in how many counties saw download speeds fall below the government standard**
    - **If you don't have internet access, you're cut off from society**
- **POSITIVE CONSEQUENCES???**

Impact on Society: Crowdsourcing

- Crowdsourcing is a model in which individuals or organizations obtain goods, services and ideas from a large, open community of Internet users.
  - COVID-19 data collection (Harvard Medical School) - https://www.covidnearyou.org/#!/
    - a collaboration between Harvard Medical School and the Boston Children's Hospital, asks visitors to voluntarily self-report daily if they are experiencing COVID-19 symptoms. The platform uses the data in real-time to update a map of the U.S. that allows users to see how many people—at the zip code level—have experienced symptoms.

Impact on Society: Crowdsourcing

- ***CitizenScience.gov*** is an official government website designed to accelerate the use of crowdsourcing and citizen science across the U.S. government.
  - Scientific research conducted to collect relevant data ; contributors use their own devices to record data.
  - https://www.latimes.com/science/story/2020-04-14/how-citizen-scientists-can-help-fight-covid-19

Today's Plan

- This is Computer Science→It all deals with the Impact on Society
- **Impact of Computing**
  - Positive Impacts (beneficial Effects)
  - Negative Impacts (Harmful Effects)
- The Present
  - **Digital Divide**
  - Crowdsourcing

Today's Plan

- The Future→
  - **What have we learned by being ONLINE?**
  - Can we choose computing innovations or technologies and have our students understand BOTH the beneficial effects and the harmful effects of the innovations?
    - Since we have been forced into virtual teaching and learning, have any computing innovations *stood out* for you or your students?
  - How can our experiences help us lessen the *negative* effects and strengthen the *positive effects?*

THANKS MUCH!!!!

Resources

- Code CS Https://code.org/files/computer_science_is_foundational.pdf
- Elderly: https://www.researchgate.net/publication/303817159_The_impact_of_technology_on_older_adults'_social_isolation
- Fake news: https://www.theguardian.com/us-news/2019/jun/06/fake-news-how-misinformation-became-the-new-front-in-us-political-warfare
- Targeted Advertising:
  - https://www.sciencedirect.com/science/article/pii/S0969698918307744
  - https://www.theguardian.com/world/2019/nov/05/targeted-ads-fake-news-clickbait-surveillance-capitalism-data-mining-democracy
  - https://www.bigcommerce.com/blog/social-media-advertising/#the-6-best-social-networks-for-ecommerce-advertising
- Education:
  - https://tophat.com/blog/how-does-technology-impact-student-learning/
  - https://www.theguardian.com/world/2020/apr/13/coronavirus-covid-19-exposes-cracks-us-digital-divide