Exploring Innovations

Unit 1. Your Virtual World

Revision Date: Jan 15, 2020
Duration: 2 50-minute sessions

Lesson Summary

Students will read about and discuss the issues that arise from the use and misuse of technology. Over the two sessions, students will assess their current uses of computing devices and then narrow their focus to research and then discuss social media, online retail and banking, cloud data storage, and government surveillance as a class.

Learning Objectives

CSP Objectives

- *EU CRD-1 - Incorporating multiple perspectives through collaboration improves computing innovations as they are developed.*
    - LO CRD-1.C - Demonstrate effective interpersonal skills during collaboration.

- *EU IOC-1 - While computing innovations are typically designed to achieve a specific purpose, they may have unintended consequences.*
    - LO IOC-1.A - Explain how an effect of a computing innovation can be both beneficial and harmful.
    - LO IOC-1.B - Explain how a computing innovation can have an impact beyond its intended purpose.

- *EU IOC-2 - The use of computing innovations may involve risks to your personal safety and identity.*
    - LO IOC-2.A - Describe the risks to privacy from collecting and storing personal data on a computer system.

Essential Questions

- What are some potential beneficial and harmful effects of computing?
- How do economic, social, and cultural contexts influence innovation and the use of computing?

Teacher Resources

Student computer usage for this lesson is: **required**

These materials may be useful if you want to spend some time with the entire group discussing a few key topics.

- Video: "Your Facebook life in 62 Seconds" http://www.cnn.com/2014/02/04/tech/social-media/facebook-look-back-video/ (http://www.cnn.com/2014/02/04/tech/social-media/facebook-look-back-video/)
- Article on Facebook about privacy: https://www.facebook.com/about/privacy/ (https://www.facebook.com/about/privacy/) .
- Article: Ten Commandments of Computer Ethics - http://en.wikipedia.org/wiki/Ten_Commandments_of_Computer_Ethics (http://en.wikipedia.org/wiki/Ten_Commandments_of_Computer_Ethics)

Lesson Plan

Session 1

Getting Started (10 min)

Assign each student a number from 1 to 4. Students read the associated articles and prepare a 1 minute summary of a way computing fostered creativity.

1. in medicine (https://time.com/5710295/top-health-innovations/ (https://time.com/5710295/top-health-innovations/)).
2. in communication (https://www.intel.com/content/www/us/en/research/emerging-innovations.html (https://www.intel.com/content/www/us/en/research/emerging-innovations.html)).
3. in engineering (https://interestingengineering.com/11-of-the-most-important-yet-underrated-computing-inventions (https://interestingengineering.com/11-of-the-most-important-yet-underrated-computing-inventions)).
4. in arts, music or entertainment (https://www.complex.com/style/2013/12/digital-art-technology/the-gif (https://www.complex.com/style/2013/12/digital-art-technology/the-gif)).

Groups share their summaries.

Guided Activity (40 min)

Vocabulary:

Ask students to define the following. Compare their definitions to the ones below.

1. Computer
2. Computer System
3. Computer Network
4. The internet

1. Computer - something that can execute a program. Many devices (tablets, smartphones, robots, smart sensors) contain computers.
2. Computer system - a collection of computers and software that must function together to complete a task
3. Computer network - a type of computer system allows communication between multiple computers
4. internet - the one worldwide, public computer network

Computing innovations can have unintended consequences. We will investigate some ethical considerations that should be considered before releasing a new development. For this activity, group students in pairs. If there is an odd number of students then a group of three may be used.

- Students work in pairs to examine the Wikipedia article, "Ten Commandments of Computer Ethics" (http://en.wikipedia.org/wiki/Ten_Commandments_of_Computer_Ethics) and identify and share the two commandments they think are the most commonly violated.

- Students read commandments and individually identify the two they think are most frequently violated.

- Students share the two commandments they identified with partners and discuss why they choose the commandments they did.

- Pairs select two they think are the most significantly violated. Collect the responses from the class.

As a class suggest revision(s) to the 10 Commandments of Computer Ethics.

 Divide the class into four groups. Each topic group will work together to explore resources and prepare to share with the other groups tomorrow. Each student in the group should make their own copy of the worksheet, so they can bring them back to their original jigsaw groups. Students use their worksheet (ExploringInnovationsWorksheet.docx) to identify and record

- potential impacts of the technology,

- whether they primarily affect individuals or society as a whole, whether they are positive or negative,

- evidence of that impact

- the source they used to find the information.

After completing the worksheet, students should complete the Venn diagram (ExploringInnovationVenn.docx) to summarize key impacts of an innovation.

The topics (and examples of positive (+) and negative (-) impacts) include:

- Social media (+ connecting at a distance, - cyberbullying)

- Online retail, banking, and businesses (+ convenience, - identity theft)

- Cloud data storage (+ information sharing, - loss of privacy)

- Government surveillance (+ find terrorist threats, - loss of privacy)

For each of the above topics, there is a resource sheet in the lesson folder that can be provided to student groups. (Optionally, you may want to create additional resource sheets, or let students select other topics and find their own resources.)

Wrap Up (5 min)

Each group should discuss its progress this far in researching their topic. Students will have 10 minutes tomorrow to prepare to make a presentation to the rest of the class.

Session 2

Getting Started (3 min)

Students should take a few minutes to journal about the following prompt:

- Think about your typical day. How often do you think that your image has been captured by a surveillance camera? List all of the places where your image may have been captured. Also, consider what you have done in the past week. What data might have been collected about you somewhere over the past week?

Guided Activity (30 min)

Topic Groups: Have students briefly assemble into topic groups to compare and revise notes.

Jigsaw Groups: Have students assemble into their original jigsaw groups. Each member will present the information on the topic that was researched. All notes need to be shared within these groups.

Regroup and discuss the topics as a class if time permits.

Wrap Up (5 min)

Each student should select a topic that they would like to explore further and write the topic in their journal. It might be a narrow subtopic from the broader topics that were explored within this lesson. They might also want to write down a few interesting innovations connected to a topic. They will refer back to this during the practice performance lesson later in the unit.