Digital Healthcare Technology: An Introduction

**Overview**

This lesson introduces students to the field of digital healthcare as an upcoming discipline that involves the use of information and communication technologies to help address the health problems and challenges faced by the general public. Digital healthcare is concerned with the development of computer technologies to aid healthcare professionals and patients in managing illnesses and health risks as well as in promoting health and well-being. These technologies include both hardware and software solutions and services, such as wearable computing, gamification, telehealth and telemedicine.

In other words, digital healthcare technology serves as a **check engine light for your body**!

**Standards**

**Common Core State Standards**

- **CCSS.ELA-Literacy.SL.9-10.1**
  Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9-10 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively.

- **CCSS.ELA-Literacy.SL.9-10.2**
  Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source.

- **CCSS.ELA-LITERACY.RST.9-10.4**
  Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.

**Michigan Educational Technology Standards**

- **9-12.RI. Research and Information Fluency**
  Identify, evaluate, and select appropriate online sources to answer content related questions

- **9-12.CT. Critical Thinking, Problem Solving, and Decision Making**
  Use digital resources (e.g., educational software, simulations, models) for problem solving and independent learning

**Objective**

Students will be able to analyze how digital healthcare technologies support personal health and to identify various career options in the field of digital healthcare.
Advance Preparation

- Make sure you have a computer and projector available.
- Gather example images you will use for the warm up. If possible, use something you have on hand, like a Fitbit® or other wearable technology. Any health-related apps that you currently use would also be effective.
- Post the objective of this lesson, the digital healthcare definition and a place to show responses to the questions attached to the videos.
- Watch the videos for each segment. These include:
  - The Future of Health and Fitness @ CES 2016 for the Introduction
  - HFII StatChat Healthcare Technology Video (2:06)
  - HFII Drone Healthcare Technology Video (1:42) for How is Digital Healthcare Technology Used?
- Review the following student handouts:
  - Student Handout #1, Advancing Digital Healthcare Technology
  - Student Handout #2, Analyzing Digital Healthcare Technology
- Review the segment on “Exploring Further” and make any necessary preparations to execute this segment.

Warm-Up (5 MINUTES)

- Begin the lesson by asking students if they (or someone they know) has access to a piece of technology that helps them monitor or prevent health problems.
- Ask students to briefly share the technology (apps, hardware, games, etc.) and to ask the class:
  - What if people in the future had access to technology that made taking care of their illness easier? Or had access to technology that prevented illnesses altogether.
  - What might one of these technologies look like?
- Show examples of current digital healthcare technology, such as a Fitbit®, the use of texting by Crisis Text Line, or a smartphone app like the one offered by Weight Watchers®. Ask students:
  - How might this technology benefit someone?
  - Does this example assist with the prevention of issues or help in monitoring of one’s overall health?
- Show the short video The Future of Health and Fitness @ CES 2016 for further examples of how digital healthcare technology can both prevent health issues and support care and monitoring of existing health problems.

Introduction (5 MINUTES)

- Review the objective of the lesson with students. Explain to students that in this lesson they will both analyze several examples of healthcare technology and explain how this technology can directly impact someone’s health. They will also identify various career options related to the healthcare technology field.
- Post the objective in the classroom. You will return to the objective at the end of the lesson to check with students to see if you think the objective has been met.
- Explain to students that in order to meet our objective they will begin by reviewing a definition of “Digital Healthcare Technology”
Henry Ford Innovation Institute and The Henry Ford Present
Opportunities in Digital Healthcare Technology Careers

What is Digital Healthcare Technology? (20 MINUTES)

- Students remain in their groups to now examine how digital healthcare technology can assist medical professionals as well as patients in preventing and treating medical issues.
- Have students brainstorm a list of careers they think may be associated with the digital healthcare field.
- Show the HFII StatChat Healthcare Technology Video (2:06) as a foundation for Student Handout #1 Advancing Digital Healthcare Technology.
- Distribute Student Handout #1. Give students the following directions for completing the handout.
  - You are to create an entirely new digital healthcare technology product or improve upon one that already does.
  - Use the handout to take notes of examples from the video.
  - You will need to complete each box in your handout to demonstrate how your product meets each requirement.
  - You may draw to supplement your writing, but must be able to explain your drawings.
  - Include possible careers in the digital healthcare field as part of your product.
- Once students have completed Handout #1, have them complete a structured share out of their inventions.
- Review with students the definition of digital healthcare that you have previously posted in the room, by drawing parallels in the definition to their innovations.

How is Digital Healthcare Technology Used? (15 MINUTES)

- Students remain in their groups to now examine how digital healthcare technology can assist both medical professionals and patients in preventing and treating medical issues.
- Distribute Student Handout #2 Analyzing Digital Healthcare Innovations or post the handout. Review with the students the following questions, which appear on the handout.
  - What medical problem is the video addressing?
  - What innovation (digital healthcare technology) was developed to solve the problem?
  - How does the innovation assist patients with their health risks? How does the innovation assist medical professionals with patient health risks?
  - What is a possible career related to this technology? Think about producing, using and maintaining this digital healthcare technology.
- Give the students the following directions for the handout:
  - We are going to watch a video highlighting the use of digital healthcare technology.
  - While you watch the video, think about the handout questions we’ve reviewed and take notes on the handout for your answer to each question.
- Show the video HFII Drone Healthcare Technology Video (1:42) and then answer the questions together, posting the answers in the classroom.
- Share the Teacher Resource answers with students and review student responses.
- Continue to highlight possible careers and job skills that enable the development and use of healthcare technology.
- If there is time, repeat this sequence for the HFII 3D Healthcare Technology Video (2:50)
- Ask students to answer the same questions using this video. Have each group report their answers, emphasizing possible career connections they might have come up with.
Closure (5 MINUTES)
• Review the objective that was posted in class and check with students to see if they believe the objective has been met. Include a review of the career options the class has identified.
• Introduce the Exit Ticket "What Do You Think?" to assess students’ mastery of the objective.
• As students leave the room, collect their tickets to review later as a formative assessment.

Resources
Teacher Resources
• HFFII Drone Healthcare Technology Video (1:42)
• HFFII 3D Healthcare Technology Video (2:50)
• HFFII StatChat Healthcare Technology Video (2:06)
• The Henry Ford’s Visionaries on Innovation
• The Henry Ford’s Innovation Nation Episode Guide

Student Resources
• The Henry Ford’s Innovation Nation Clip — Toys as Healthcare Technology (4:18)
• The Henry Ford’s Visionaries on Innovation

Explore Further
Digital Healthcare Technology Career Options
• View the HFFII 3D Healthcare Technology video (2:50)
• Have students create PowerPoint slides, explaining what steps might have taken place to produce the technology highlighted in the video.
• Have students list possible career options, based on each step of the PowerPoint.

The Henry Ford’s Digital Collections
• Assign students the task of investigating Dr. Howard’s Office in our digital collections.
• Students should report evidence of innovation they can observe in Dr. Howard’s Office.
• Next, have students recreate his office updating it with 21st-century technology. What would be the same and what would look different?

The Henry Ford’s Field Trip Guide
• Watch The Henry Ford Innovation Nation episode — Toys as Healthcare Technology (4:18).
• Visit the “Genius at Play” toy store at Henry Ford for Kids.
• Plan a field trip for students to purchase several items from the toy store to create a digital healthcare product.

Research a new innovation in digital healthcare technology using the student resources listed at the end of the lesson.
• Evaluate the innovation for its advantages to healthcare.
• List possible disadvantages related to the innovation.
## Student Handout #1
Advancing Digital Healthcare Technology

<table>
<thead>
<tr>
<th>Medical problem</th>
<th>Innovation (new/improved product)</th>
<th>How it helps medical professionals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How it helps patients</th>
<th>Skills needed to create the product</th>
<th>Careers associated with those skills</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Student Handout #1 (Teacher Example)
## Advancing Digital Healthcare Technology

<table>
<thead>
<tr>
<th>Medical problem</th>
<th>Innovation (new/improved product)</th>
<th>How it helps medical professionals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of communication between staff in hospitals.</td>
<td>StatChat — A patient-centered communication tool that helps keep healthcare providers connected.</td>
<td>Ease of communication; real-time patient information can be shared without delay.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How it helps patients</th>
<th>Skills needed to create the product</th>
<th>Careers associated with those skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse patient outcomes are associated to a lack of communication. Reduces stress, repetition of communication for healthcare providers, patients receive better overall care since everyone is on the same page.</td>
<td>Computer programming, software sales, medical coding, app building.</td>
<td>Webmaster/social media director, software developer, graphic designer, app designer.</td>
</tr>
</tbody>
</table>
Student Handout #2
Analyzing Digital Health Innovations

Directions:
Think about these questions as you watch the video, taking notes on the handout.

What medical problem is the video addressing?

1. ________________________________
__________________________________________________________________________

2. ________________________________
__________________________________________________________________________

What innovation (digital healthcare technology) was developed to solve the problem?

1. ________________________________
__________________________________________________________________________

2. ________________________________
__________________________________________________________________________

How does the innovation assist patients with their health risks? How does the innovation assist medical professionals with patient health risks?

1. ________________________________
__________________________________________________________________________

2. ________________________________
__________________________________________________________________________

What is a possible career related to this technology? Think about the production, use and maintenance needs of this product.

1. ________________________________
__________________________________________________________________________

2. ________________________________
__________________________________________________________________________
What Do You Think?

Name: ___________________________________________

How does digital healthcare technology support personal health?

   a. Makes it easier for people to stay healthy
   b. Gets information to doctors quickly
   c. Enables patients to monitor their health
   d. All of the above

How can you use digital healthcare technology (hardware or software) to monitor or prevent your own health issues?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

After this lesson, would you be more likely to think about a career in digital health technology? Why or why not?

________________________________________________________________________
________________________________________________________________________

Identify two careers in the digital healthcare field you might choose to pursue.

________________________________________________________________________
________________________________________________________________________
Student Handout #2 (Teacher Example)
Analyzing Digital Health Innovations

Directions:
Think about the questions as you watch the video, taking notes on the handout.

What medical problem is the video addressing?

*Delivery of important supplies, lab results and other important medical information for employees who make 300,000 home visits and drive over 4,000,000 miles each year.*

What innovation (digital healthcare technology) was developed to solve the problem?

*Drones as a more efficient delivery method for traveling nurses, other traveling employees in hospitals.*

How does the innovation assist patients with their health risks? How does the innovation assist medical professionals with patient health risks?

*Patients have access to care and other medical information in a more timely and efficient manner, so they have a better opportunity to monitor and prevent their personal health issues. Medical professionals can save time transporting this information which is currently unpaid, inefficient and aggravating for them.*

What is a possible career related to this technology? Think about the production, use and maintenance needs of this product.

*Drone driving, repair and programming, product design, fabrication and maintenance.*