BEEC Share and Learn Report: April 2026

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Topic: BME Eras Tour: ASEE Education Showcase Deep Dive

Resources:

- Will get word doc to use as a guide to try in the classroom
- Major Outbreaks Timeline: https://stacks.cdc.gov/view/cdc/82642
- Tuskegee Videos from CDC: https://www.cdc.gov/tuskegee/about/index.html
- Case studies: e.g. history of pelvic exam training of medical students
    - https://circulatingnow.nlm.nih.gov/2022/02/03/what-history-reveals-slavery-and-the-development-of-u-s-gynecology/
    - https://www.pbs.org/wgbh/americanexperience/features/cancer-detectives-brief-history-speculum/

Discussion and Lecture Notes:

Lecture Notes:

- Early-stage goal to help with engineering identity in an intro to BME course
    - Intro to BME
    - Design and Research Methods course (at Cincinnati)
    - Undergraduate survey
- Before and after HW activity to pick a disease or topic and what problem they would solve – find patent, publication, or professor who works in that space
- Introduce eras – pre-industrial revolution, industrial revolution (WW1) – invention of antiseptic techniques and medicine as a discipline, WWII and industrialized society, space age, 70's, 80's, 90's, 2000's, 2010-present day categories
    - 9 eras, divide based on number of groups
    - Get worksheet, get 20 minutes to fill out – major world events, common medical conditions, perception of medicine
    - AI Prompt for Think Pair Share – convert doc into monologue
- First era – enlightenment, scientific method, early prosthetics and surgical tools, herbal medicine was common and healing was religious or mystical.
- Era 2 – industrial revolution - X-rays, physics and use of these led to stethoscopes, glass manufacturing processes, electricity and steam power, medicine more scientific and common but hospitals feared because of disease spread
- Era 3 – 1950's and WWII, technology rewarded for how could save lives, antibiotics reduced wound deaths, computing systems and atomic technologies help drive innovation, trust in medicine grew and technology can have impact on care they received, medicine professional societies started
- Era 4 – space age – ultrasound, pacemakers, artificial organs, people more optimistic by how technology can save lives, transition towards chronic conditions
- Era 5 – 70's – diagnostics
- Era 6 – 80's – artificial heart, CT/MRI, AIDS big topic, surgeries had more tech involved
- Era 7 – 90's – minimally invasive surgeries, people believe in tech in medicine and look for interventions be
- Era 8 – 2000's – additive manufacturing, CRISPR and genetic engineering, push from macro to micro frontiers of technology, digital revolution and bioinformatics
- Era 9 – modern day – COVID brough mRNA vaccines, wearables, AI in healthcare, pushback in trust in vaccines, ongoing challenges in cancers, age related diseases, AI diagnostic and remote patient monitoring, transformed how quickly we develop technologies

- Where to go from here?
    - What are issues of our time?
    - Issues of future?
    - Major tech breakthroughs on horizon?
    - What will next diseases be?
    - What are best and worst case scenarios?

Discussion:

- Normally takes 40-45 minutes to do whole thing – half of a Tu/Th class or whole M/W/F class session
- Do this and then do a HW to go look for something you work on to help them think about where they're at
- Give props during eras! E.g. wigs, games, etc.
- Think about discussion in ethics and how we can use it to help set up the dilemmas across different eras to help build interest and pattern recognition of dilemmas and value systems
    - Tie perception of medicine given world events and what the values were, e.g. pre-industrial revolution if medicine is based on religion and moral
    - E.g. stem cell research in early 2000's and laws in regards to genetic technologies – Dolly the sheep, cloning and "playing God"
- IRB wasn't implemented until 70's aftermath of Tuskegee studies but it didn't crystalize until 90's
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- Talked about case studies: e.g. history of pelvic exam training of medical students
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