Investigating Computer Innovations in Agriculture

What impacts have computer innovations made in agriculture and are these impacts positive or negative?

Complete these activities to investigate innovations in agriculture. For each exercise, look at the data used to complete the task; any data privacy, security, or storage concerns that might be associated with the innovation; and beneficial and harmful effects the computing innovation might have on society, the economy, or culture. (AP CSP Course Framework p. 111)

Activity 1 Marking the text
Choose an article that highlights both beneficial and harmful effects of a specific computing innovation.
1. Mark which effects are beneficial and which are harmful.
    a. For each effect marked as harmful, add notes about whether these effects should have been anticipated in advance.
    b. For each effect marked as beneficial, make notes indicating if these benefits were intended or unintended.
2. Circle any information that is connected to data.

Activity 2 Jigsaw - Group activity
Choose articles regarding the impact of computing innovation on agriculture.
1. Each person in the group reads an article about a different topic (Drones/UAVs, 3D printing or mapping as it relates to agriculture) taking on the role of ¨expert¨ on what was read.
2. Share the information from each reading with students from other groups and then return to your original group to share any new knowledge.

Activity 3 Rapid Research - Group activity
Each group will research an assigned computing innovation and make three presentations to share with the group. Assign roles to each member of the group which may include:
*   Leader or manager: Responsible for keeping the group on task and overseeing each component of the activity
*   Secretary or recorder: Takes notes and the minutes of meetings
*   Artist/Creative director: Makes drawings, diagrams or illustrations as needed
*   Monitor: Watches the time, distributes and collects equipment, keeps work area tidy

    Presentation 1. **Overview of topic** using Google Slides - 30 seconds to a minute
    *   Presentation must give an overview of the innovation, including the following:
        *   Provide a summary of the article
        *   Identify the impact of the innovation on people and society that you care about.
    Presentation 2. **Two sentence review** using Flip Grid - 30 seconds (https://info.flipgrid.com/)
    *   What are the positive (+) and negative (-) impacts on society, economy, or culture?
    *   What do I want people to know about this?
    *   Choose one of the sentence frames below for your second presentation:
        *   It is clear that _____; therefore, _____. While others try to persuade you that _____, the evidence suggests that _____

because _____.
- Due to the fact that _____, it seems evident that _____ in order to _____.

Presentation 3. **Meme** (https://www.canva.com/create/memes/) - about 10 seconds
- Make a tagline for your innovation and design a meme slide using your tagline.
- Once the meme is made, copy the URL address or take a Snip using the Snipping tool.

POSSIBLE TOPICS and SOURCES
Topics: Drones/UAVs, 3D printing, 3D Mapping, Hydroponics, Robotics, Self Driving Vehicles, Internet of Thing (IoT)

https://www.rocketspace.com/corporate-innovation/15-agtech-startups-to-watch-in-2020	15 Agtech Startups to Watch in 2020
https://www.downtoearth.org.in/blog/agriculture/applying-modern-tech-to-agriculture-66017	Applying Modern Tech to Agriculture
https://insideunmannedsystems.com/how-will-drones-change-agriculture/	How Will Drones Change Agriculture?
https://myfarmlife.com/equipment/how-3d-printing-helps-save-time-in-agricultural-manufacturing/	How 3D Printing Helps Save Time in Agricultural Manufacturing
https://www.raconteur.net/sustainability/top-5-tech-innovations-in-agriculture/	Top 5 Tech Innovations in Agriculture
https://disruptorleague.com/2018/08/06/5-innovative-agricultural-practices-that-are-changing-the-world/	5 Innovative Agricultural Practices That Are Changing the World
https://www.sciencedirect.com/science/article/pii/S2589721719300339	Edge Computing: A tractable model for smart agriculture?
https://news.mit.edu/2019/algorithm-growing-agriculture-0403	The Future of Agriculture is Computerized
https://hubpages.com/food/The-Role-of-Information-Technology-in-Agriculture	The Role of Information Technology in Agriculture
https://www.plugandplaytechcenter.com/resources/new-agriculture-technology-modern-farming/	New Agriculture Technology in Modern Farming

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