Multimedia Design Project: Project Report and URL

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Product URL:

http://crosbygmo.weebly.com/

Analysis

Learner Analysis

This Webquest was designed to the meet the needs of a ninth grade co-taught environmental science class. The students' ages range from fourteen to sixteen years old. Many students struggle in science due to math and reading deficits. Out of the 133 students that will be using the Webquest, twelve of them are inclusion students who have been identified as having a specific learning disability (SLD), an emotional behavior disorder (EBD), or is hearing impaired. All students have been exposed to internet research in the past and have completed a Webquest in this class. As a science class, they have also been exposed to various project-based learning tasks and work often in small groups. Small groups change often, many times differentiated by mastery of content but for the purposes of this Webquest, students will be placed in mixed-ability groups so that collaboration is both necessary and meaningful for the students.

Context Analysis

Each class size ranges anywhere from twenty-three to thirty students. Each class period is 52 minutes long and meets daily Monday through Friday. In my classroom, I have ten student computers and about half of the students have access to personal technology that can be used to complete the Webquest. However, for the first few days of the Webquest it will be necessary to reserve a computer lab so that each student can download the supplemental graphic organizers and see the information more clearly. Some have difficulty seeing the information on their phones since it is so small. All computers to be used will have to have Adobe Flash Player downloaded if not already loaded. One student computer will have to be set to show close captioning for videos to be viewed.

Since these students have completed a Webquest and have created a product with the same technology in this class prior to this occasion, student and teacher comfort level with the technology is very high.

Standards Addressed

Science Standards

SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.

b. Recognize that different explanations often can be given for the same evidence.

SCSh6. Students will communicate scientific investigations and information clearly.

b. Write clear, coherent accounts of current scientific issues, including possible alternative interpretations of the data.

c. Use data as evidence to support scientific arguments and claims in written or oral presentations.

d. Participate in group discussions of scientific investigation and current scientific issues.

SEV4. Students will understand and describe availability, allocation, and conservation of energy and other resources.

f. Describe the need for informed decision making of resource utilization (i.e. energy and water usage allocation, conservation of food and land, and long-term depletion).

SEV5. Students will recognize that human beings are part of the global ecosystem and will evaluate the effects of human activities and technology on ecosystems.

f. Describe how political, legal, social, and economic decisions may affect global and local ecosystems.

NETS-S Standards

1. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.

b. Create original works as a means of personal or group expression.

2. Communication and Collaboration: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.

d. Contribute to project teams to produce original works or solve problems.

3. Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.

a. Plan strategies to guide inquiry.

b. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.

4. Critical Thinking, Problem Solving, and Decision Making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate tools and resources.

b. Plan and manage activities to develop a solution or complete a project.

5. Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.

a. Advocate and practice safe, legal, and responsible use of information and technology.

b. Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity.

6. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems, and operations.

a. Understand and use technology systems.

b. Select and use applications effectively and productively.

d. Transfer current knowledge to learning new technologies.

Task Analysis

Essential Question

How and why are organisms genetically modified and how does it affect the ecosystem as a whole?

Learning Objectives

Students will be expected to how organisms are genetically modified, why this is done, and the risks and benefits that doing this has on the environment as a whole.

Dispositional Objectives

During this task, students will expected to work in small groups, learning to collaborate and work together to share knowledge and produce a final product.

Overview

Introduction

Students will be acting as ambassadors for the World Health Organization. The problem they will be presented with is that bioengineers and researchers have developed a new type of grain that has been genetically modified so that it can be mass produced and which contains ample nutritional benefits for the growing human population. However, many other scientists and physicians feel that because this type of technology is very new, it presents many risks not only to the human population but to the ecosystem. Many are also worried that producing a mass crop of this type might hurt the agricultural economy and therefore the world economy. Student ambassador teams will be asked to discover how crops are genetically modified, the benefits of producing them (why are they produced?), and the risks they pose by their production. Then students will present their findings in the form of a brief video to the World Health Organization, encouraging them to either adopt or dismiss this new grain.

Task

Students will be placed in mixed-ability groups of three students per team. Students will be asked to investigate the following:

- How are crops genetically modified?
- What are the benefits of genetically modifying crops?
- What are the risks associated with genetically modifying crops?

Once they have completed the research, they will prepare a presentation that either supports or opposes the use of genetically modified crops.

Process

The process will be split into two parts: Research and Presentation.

Research: Student teams will assign one of the following tasks to each team member: Geneticist, Lobbyist (Pro), Lobbyist (Anti). The geneticist will be responsible for discovering how and why crops are genetically modified. The Lobbyist (Pro) will be responsible for researching the benefits of using genetically modified crops. The other Lobbyist (Anti) will be responsible for researching the risks associated with using crops that have been genetically modified. Students will be using the following resources in their research. I chose many of these resources from PBS Learning Media so that the content was appropriate for the grade level for the students. I viewed all resources prior to student use to analyze their effectiveness and context.

Engineer A Crop: Transgenic Mutation. *Harvest of Fear: A Nova/Frontline Special Report.* Retrieved November 20, 2013 from

http://gpb.pbslearningmedia.org/resource/tdc02.sci.life.gen.engineeracrop/engineer-a-crop-transgenic-manipulation/.

Biointeractive: Genetic Engineering. Howard Hughes Medical Institute. Retrieved November 20, 2013 from http://www.hhmi.org/biointeractive/genetic-engineering.

Is Genetically Modified Food Safe To Eat? *Harvest of Fear: A Nova/Frontline Special Report.* Retrieved November 20, 2013 from http://www.pbs.org/wgbh/harvest/viewpoints/issafe.html.

Prakash, R. (2010). How does genetic engineering work? *Bright Hub.* Retrieved November 19, 2013 from http://www.brighthub.com/science/genetics/articles/101239.aspx.

Should We Grow GM Foods? *Harvest of Fear: A Nova/Frontline Special Report.* Retrieved November 20, 2013 from http://www.pbs.org/wgbh/harvest/exist/.

What Are the Benefits? *Harvest of Fear: A Nova/Frontline Special Report.* Retrieved November 20, 2013 from http://www.pbs.org/wgbh/harvest/viewpoints/benefits.html.

What Are the Risks? *Harvest of Fear: A Nova/Frontline Special Report.* Retrieved November 20, 2013 from http://www.pbs.org/wgbh/harvest/viewpoints/risks.html.

What is Genetic Engineering and How Does It Work? *Ag Biosafety: University of Nebraska*. Retrieved November 19, 2013 from http://agbiosafety.unl.edu/basic_genetics.shtml.

Presentation: Student teams will reconvene and discuss their findings from the research and decide whether they support or oppose the use of genetically modified crops. They will then prepare a PowToon presentation. PowToon is an online tool that creates videos out of slideshow presentations. In the presentation they must include the following information:

- What is genetic engineering?
- How do scientists go about genetically engineering an organism?
- What are the applications of genetic engineering?
- Did the team decide that it was in support of or did it oppose the use of genetically modified crops?
- Five facts supporting their decision and the source
- 3 pictures throughout the presentation that relate to/support the topic
- Team member information

To create their presentation, students will use the following resource:

PowToon Beta (2012). Software. Retrieved November 28, 2013 from http://www.powtoon.com/

Details

Universal Design, Differentiation, and Assistive Technology

As a teacher of inclusion students who have been diagnosed with SLDs, EBDs, and hearing impairments, the WebQuest is designed to accommodate for these students. The first strategy used to accommodate these students was the creation of research aids (worksheets or graphic organizers depending on their assignment, see appendix). By adding these research aids, students are provided with various ways to interact with the materials (UDL 4.2). In addition, students will be provided with links to the definitions of difficult vocabulary that is included in the WebQuest and are informed of this addition prior to beginning the WebQuest (UDL 2.1). The terms are: exponentially, genetically engineered, support, oppose, geneticist, lobbyist. The links are in a different color than other links to eliminate confusion between vocabulary and various potential sources for information. In addition, there is a link to the transcript of the audio portions of the WebQuest so accommodate for students who are hearing impaired (UDL 1.2).

Grouping Strategies

For this task, students will be grouped into mixed ability groups. Student scores from previous assessments will be used for grouping. Groups will consist of three students: a high-level learner, an average-level learner, and a low-level learner. The motivation for grouping this way is to enhance collaboration (UDL 8.3). The ultimate goal by using the strategy is for students is to help and teach one another throughout the experience. Student groups may choose who is assigned what task: Geneticist, Lobbyist-Pro, and Lobbyist-Anti. The geneticist will be responsible for discovering how and why crops are genetically modified. The Lobbyist (Pro) will be responsible for researching the benefits of using genetically modified crops. The other Lobbyist (Anti) will be responsible for researching the risks associated with using crops that have been genetically modified. Group members may assist each other as needed throughout the research. When done, groups will reconvene and share their research and work together to make a decision to support or oppose the use of genetically modified crops. Group members will all assist with the creation and management of the PowToon.

Multimedia Elements

To add the engagement and enhance the overall learning experience, I added both a video and an audio clip to the WebQuest. Video: To add to the introduction and promote student engagement in the activity, I created a video with some alarming hunger statistics to grab their attention. I chose to use PowToon for the video since students will be using the same web application to create their presentations. I did add background audio to add to the overall effectiveness of the video but since much of the video was text, I did not add in a voice-over.

Audio: I decided to use a Voki for the audio part of the project to assist those students who have trouble with written content (UDL 1.3). I decided to have the audio describe the Task but also provided a link to the transcript for my hearing impaired student.

Development

This WebQuest was designed using free web-based software called Weebly. I have used Weebly before but at the point of development, it was still fairly new to me so I had to give myself plenty of time to work through it. First, I had to locate and/or create resources that I wanted to use. I was familiar with many of the resources that I used so it took about five hours to select and create the resources. About two hours of that time was used to create the PowToon video and the Voki audio resource. Since I have used a lot of the other content, the other hours were narrowing down the resources, rubrics, and worksheets I wanted to use. It took me about two hours to do the initial set up for the website, which was basically the outline of how it was to be set up. I began with an Introductory page, a Task page, a Process page, an Evaluation page, a Conclusion page, and a Teacher page with sub-headings for Learners, Standards, Processes, and Resources. Over the next several days I added instructions, content, links to web resources and multimedia to the appropriate pages. This took a total of about six hours to add since I ended up moving this around often. During the development stage, after receiving feedback from peers about the WebQuest, I decided to add sub-headings for each of the various individual assignments on the Process page (Geneticist, Lobbyist (Pro), Lobbyist (Anti)) so that the information was not as overwhelming to students. I also broke down the Task page into bulleted sections to make it more user-friendly. This clean up took an additional two hours to complete. Once completed, I went through the website to make sure all links worked correctly.

Implementation

Since the classroom where I teach only has ten student computers, I would first have to reserve a computer lab for individual students to be able to do their research. Adobe Flash Player is needed for some parts of the WebQuest but has already been loaded onto the computers in all of the labs. Students in each team would sit next to one another in the lab so collaboration is easy. Individual computers would be necessary for the research portion of the project, which would take a total of three class periods. After that, student groups may use the student computers in my classroom to work on their presentations. They will be given two class periods to work on the presentation part of the assignment. Teams will be given an additional three days to work on the project outside of class (at home, after school in my classroom or the media center, or during lunch) to

complete the assignment. Students will be expected to submit their notes with the URL to their projects.

Teacher Notes *(Found on the Teacher Page: Process)*

Implementation Ideas

Students will need individual access to a computer (preferable) or mobile device for the research portion of the assignment. This portion will take approximately two to three 45-minute class periods to complete. For the presentation creation, student groups will need access to one shared computer per team. The presentation creation will take approximately two 45-minute class periods.

Differentiation Strategies

Links to graphic organizers are included throughout the website and on the Teacher Page: Resources tab. In addition, difficult vocabulary has been highlighted and links to definitions are provided. You can differentiate the activity by allowing lower-level learners to choose three supporting facts rather than five. Another differentiation strategy is to allow students/student groups to choose their product rather than creating a PowToon.

Evaluation

Student Learning –

Students will be expected to complete two products: a research sheet and a presentation. The research sheet will be submitted with the URL of the PowToon. The PowToon will be assessed with a rubric (included on the Evaluation page of the WebQuest and in the Appendix). In addition, I will be walking by to assess student participation and understanding of the material throughout the assignment. Students may also choose to view one another's projects prior to publishing.

Product Design –

This WebQuest was designed to be used during content covering agriculture which will take place after this project is due. Therefore, a pilot test was done with four students from a different science class to see how well the WebQuest was designed, if it was easy to navigate, and if the students felt that that the WebQuest was engaging and met the learning needs. Students were to complete a brief survey on the Conclusion page of the WebQuest and provide written feedback as well. All felt that the WebQuest was engaging and that it met their learning needs. In addition, all students felt that the WebQuest was easy to navigate and user-friendly. Written feedback responses included (Note – grammar and spelling errors have been corrected):

Student 1 (Female, age 14): "I really liked using this style WebQuest rather than the sheet with URLs."

Student 2 (Female, age 15): “I like the idea of using PowToon but maybe you could provide more options for the presentation.” This option has been added to the teacher page as a strategy for differentiation.

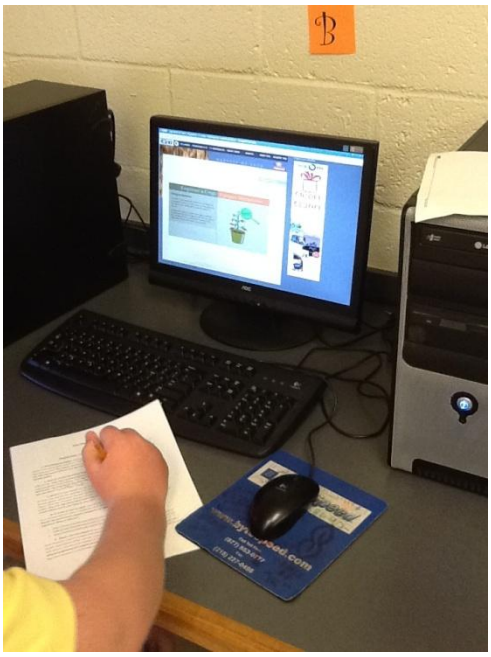
Student 3 (Male, age 15): “The video at the beginning was great. I liked how you used a PowToon for the video when that was what we would be using for the project.”

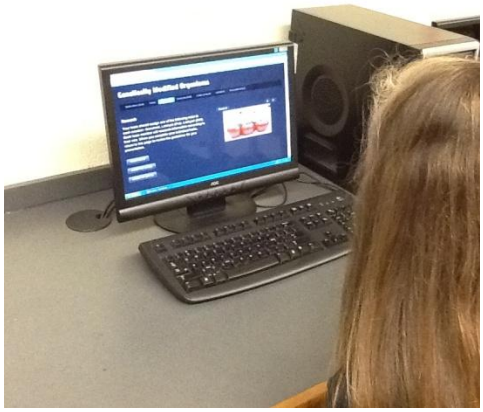
Student 4 (Male, age 14): “I liked it but I was initially confused about the words that were a different color. Once you explained what they were for, it made sense, but you may want to make a note about that on the introduction page.”

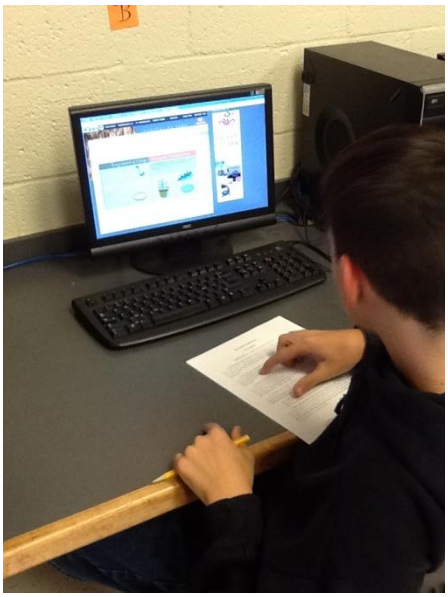
I also asked students verbal questions about the WebQuest: Did the all of the links work properly? Did you feel that the use of video and audio enhanced the overall project? Were you able to understand the directions properly or were there any that were confusing or hard to understand?

Students replied that all links were working properly and that navigation was seamless. They all felt that they video and audio enhanced the project and that without it, the website would have been “boring.” No clarification of the instructions or text was necessary but they were unsure if students who had not previously completed a PowToon would understand it without verbal explanations. (These students have used PowToon for a previous project.)

Pictures: Usability Test (Note – pictures were taken at angles so students’ privacy remains protected)







Reflection

Project Development

While preparing this project, I learned all of the details and techniques that go into web development. I knew the basics but it took a lot of planning to place all of the resources where they were supposed to go and make sure they were working properly. It was also much more difficult to make the website look professional and neat. In the rough stages of the web design, my website was very wordy and I knew students who looked at it would be completely overwhelmed and would shut down. I had to work to make the navigation more seamless and the WebQuest as a whole more organized and user-friendly. I think something that I would do in the future is that I would plan the WebQuest on paper first, literally sketching it out. I think that by doing so, I would be able to design the website much more quickly without having to go back and move things so often.

Instructional Design

I like the WebQuest as a tool for student learning. It is very organized and breaks down complex tasks for students and helps them to use online resources effectively. I like being able to guide my students to web resources I find interesting and useful and a WebQuest is an engaging way to have students use online resources. I do think, however, that having a separate "Task" and "Process" page is unnecessary. I felt like the Task page was just an overview of what I would explain further on the Process page. I did like adding in the multimedia elements because I felt like the students would enjoy them but I'm not sure if they actually added to the usability as I

intended. I think they will just end up adding the likability of the WebQuest as a whole.

Personal Growth

I felt that I became pretty fluent in web design with Weebly. It is easy to use but it did take me a good amount of time since my planning for it was proven ineffective. As I mentioned in the Project Development section, I feel that simply gathering the resources I wanted to use and then trying to put them into the website where I wanted them was time consuming and frustrating. However, it was a good learning experience and I feel that it will help as a coach to have made many mistakes along the way. It will help me when I assist others.

For Others

To other teachers, I would tell them to make a plan first. I just gathered resources and had a plan in my head. That wasn't very effective when it came time to create the WebQuest. I would also tell them to keep it simple. You can create a great WebQuest that is very effective and engaging without making it complicated.

References

Images

Figure 1: Genetic Engineering in Food (2011, October 6). *Genetic Engineering in Food. Planet Matters and More*. Retrieved December 2, 2013 from http://www.planetmattersandmore.com/environmental-issues/genetic-engineering-in-food/.

Figure 1. Genetic Engineering: The Pros and Cons. *B4Tea*. Retrieved December 2, 2013 from http://b4tea.com/food-health/genetic-engineering-the-pros-and-cons/

Figure 1. Genetically Modified Crops Giant Monsanto Faces Litigation. *Buildaroo*. Retrieved December 2, 2013 from http://www.planetmattersandmore.com/environmental-issues/genetic-engineering-in-food/

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Resources

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Appendix

Appendix 1. The Geneticist Answer Sheet

Appendix 2. Lobbyist Graphic Organizer (used for both lobbyists)

Appendix 3. Presentation Rubric

Appendix 1.

The Geneticist

1) What is DNA?

2) What is genetic engineering?

3) How is DNA important in genetic engineering?

4) Summarize the process of genetic engineering.

5) What is the difference between traditional breeding and genetic engineering?

6) What are the applications of genetic engineering?

Appendix 2. Lobbyist Graphic Organizer

Fact	Source	Expert/Witness

Appendix 3. Presentation Rubric

Categories	Exemplary (4)	Proficient (3)	Partially Proficient (2)	Incomplete (1)	Not Included (0)
Overall Effectiveness of Video (category will be multiplied x2)	Video was effective, informative and appealing.	Video was effective and appealing.	Video was effective or appealing, but not both.	Video was not visually interesting. Did not show much imagination. Did not convey information or compelling message.	Video was not finished.
Organization	Team presents information in logical, interesting sequence which audience can follow.	Team presents information in logical sequence which audience can follow.	Audience has difficulty following presentation because team jumps around.	Audience cannot understand presentation because there is no sequence of information.	Video was partially finished and what was there was disorganized.
Content Knowledge (category will be multiplied x4)	All content throughout the video is accurate. There are no factual errors. All parts of the research are answered.	1 part of the research is not accurate or not included.	2 parts of the research are not accurate or not included.	3 – 4 parts of the research are not accurate or not included.	5 or more parts of the research are not accurate or not included.
Visuals	All required visuals are included.	1 visual is missing from the video.	2 visuals are missing from the video.	3 visuals were included but one of the required visuals (picture of the disease or map) is missing	Appropriate visuals were not included.
Color Usage	Background and text colors/fonts were easy to see and were consistently used.	Background and text colors/fonts were easy to see.	Background OR text colors/fonts were difficult to see at times.	Background and text colors/fonts were difficult to see most times.	Background and text was impossible to see consistently through the video.
Animations	At least 1 animation was used effectively	1 animation was used but it did not add to the presentation	N/A	N/A	No animation was included
Total					