

**Public Service Announcement on Human Impact on the Environment and Ways to Improve Assessment Project by David Consalvi
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This project follows the application model from Educational Assessment for the Elementary and Middle School Classroom, 2nd ed., Gary D. Borich and Martin L. Tombari, Prentice-Hall, 2004. ISBN: 0-13-094789-X, pp 203-223.

Application 9.1

Lesson or unit topic:

This is a constructivist-learning unit for a 10th grade introductory biology and/or ecology course covering basic ecology principles with a specific emphasis on human impact on ecosystems. All students have had a general introduction to science covering Earth science and the scientific method. Some students have further experience with biology, chemistry, or physics. Computing skills are rudimentary with an understanding of basic functions with some minimal exposure to video and audio. The majority of student experience with this technology would be developed from private usage. However, some students have greater tech skills and will be divided to act as tech leads in their groups. Prior knowledge is diverse due to the inclusion of students from 6 different feeder schools into this high school.

Content to teach:

Students will understand the impact of human, individual and global, actions on aquatic and terrestrial ecosystems.

MLR D2 Earth – d: Describe and analyze the effects of human influences on Earth Systems.

MLR B1 Skills and Traits of Scientific Inquiry – c: Use statistics to summarize, describe, analyze, and interpret results.

MLR B1 Skills and Traits of Scientific Inquiry – g: Communicate and defend scientific ideas.

NETS-S.7: Routinely and efficiently use online information resources to meet needs for collaboration, research, publication, communication, and productivity. (4, 5, 6)

NETS-S.8: Select and apply technology tools for research, information analysis, problem solving, and decision making in content learning. (4, 5)

Performance task:

Working collaboratively in small groups, students will use prior knowledge of the influence of human interactions on their environment and they will gather detailed statistics and examples of positive and negative human interactions on ecosystems. Finally, they will develop a video podcast to inform the community of a student run recycling center and the importance of every individual to be good stewards of the Earth through recycling.

Reflection:

The selection of a topic was easy although the implementation of the performance assessment at this time in the school year was impractical. This is one of the drawbacks of a short-term course is that the time to implement many of the strategies is diminished. My students only have been with me for 3 weeks and have not had the time to prepare and complete this assessment. So, I chose to prepare an assessment for use this term. Yet, rather than rush to start the assessment, I had a few students assess what I had developed for the task directions. They enjoyed the activity of providing me feedback for a course and offered a few useful suggestions that I implemented.

I chose to develop this lesson because it has been a deficiency in my past years and seemed an appropriate way to integrate technology and meaning into the instruction. Students need to increase their understanding of the connection between their actions and the global system. Typically, we discuss, lecture, read, and debate the concepts but they are not immersed in the topics. By completing this assignment, they will be forced to consider this connection more deeply than a simple discussion or lecture can accomplish. It also serves to fulfill a need for increasing awareness of our school run recycling project for the neighboring towns. I developed this

community service project over two years ago and have been interested in finding a way to promote it better. This provides a real world value to the students and the community by filling that role.

Application 9.2

Knowledge construction:

p201 – analysis, comparison, inference and interpretation, and evaluation
acquire information and construct new information.

Analyze and Evaluate: Students will gather and analyze data and articles providing information on human consumption and waste, the impacts of trash on an ecosystem, and population change. They will evaluate the impact of that data on a community system using the program Inspiration. They will then use this visual aid to predict the impact of population changes on a community's inputs and outputs. They will also use this tool to predict the impact of behavior changes on a systems inputs and outputs. Their predictions will be presented in visual form using charts and graphs developed from quantitative adjustments to their data extrapolation.

Strategic thinking:

p201 – use prior knowledge base to use general and specific problem solving strategies.
Diagram the known facts and figures concerning human waste using Inspiration.
Indicate the connection between individual, community, and global systems.
Extrapolate from the available data the long-term costs of continuing current trends.
Predict the impact of possible changes on the systems.
Assess the validity of the findings and adjust if necessary.
Organize the prior and new knowledge into a product to inform others.

Clear communication:

p202 – may be written, oral, drawing, or diagrams – visual, written, or spoken
produces a product that may be used to judge construction knowledge, strategic thinking, and ability to convey ideas.
Communicate: Students will communicate through a video podcast the importance of reduce, reuse, and recycle for individuals and communities. During this video, students will present the effects of human influences on an ecosystem.

Social skills:

Students will work collaboratively in small groups of three to five and will support each other in creating a quality final product. Each group member should contribute and explain their portion of the work to the other members to ensure everyone understands the material and process. Students will give constructive criticism in a way that improves the project without demoralizing the other team members. Finally, students will be able to complete the task in a proper manner that fulfills the minimum requirements and in a timely manner.

Reflection:

The challenge in this portion of the PA development was selecting a specific area to place each idea. I struggled with the differentiation between knowledge construction and strategic thinking. This however seems like it should be so. Once the skills have been developed, it is hard to imagine completing one without the other. The challenge is to identify the need for each of them so that they are not lost in the instruction. An example would be a student of mine who was having trouble with chemical conversion problems. As I pressed her on the difficulty, we found that the math was not the issue. Instead, she had never developed the skill to extract the important information from the problem and was hung up on how to get started. Being a junior level course, I incorrectly assumed the skill was developed. Once that skill was presented, she progressed nicely. I think this process helps to highlight the areas where specific skills will be needed by students to succeed on the assessment and was for that reason alone was a valuable exercise.

Application 9.3

Task directions for the performance assessment:

You are going to work collaboratively with up to 4 other students to produce a video podcast to educate others on the impacts of human activities on their environment. Being from a community that derives much of its existence from the environment, it is a necessity to protect our fragile ecosystems. The marine ecosystem provides lobsters, clams, salmon, and other precious resources. The terrestrial ecosystems offer other precious resources such as the fall foliage, moose, deer, and forests. Together these natural resources provide the backbone of the local economy and are a vital component of the regions sustainability. And in this investigation, you are going to discover they are vital connections to the global community.

Your video will also be a service announcement to encourage people to reduce, reuse, and recycle at the local, student-run recycling center. The format of the announcement is up to each group to decide. You may produce a product with text, graphics, audio, live video, cartoon characters, live actors, or any original and creative means you desire. However, the final product should be appropriate to your audience, which is primarily the local community that may use your student run recycling center but also others who visit the website. The timeline for completing specific tasks will be on the Moodle site and should be followed closely to ensure the final product is completed on time.

First, each member of your group will go to <http://www.ecofoot.org/> to take an online quiz to estimate your ecological footprint. This is simply an exercise to begin your reflection of how humans impact the Earth system. Discuss amongst your group members some of the different results and ways that you can change your impact on your surroundings. Use this discussion to brainstorm on key pieces of information that will benefit your final product.

Second, each member of the group will research statistics and information on how humans impact their environment with a specific emphasis on recycling and garbage. You can find a list of helpful links in the class Moodle site or find your own sources. You should collect primary sources for your information and data for inclusion in your final products. Then you will collaborate to share what you have learned and pool the data for analysis. You are to use Inspiration, a graphic organizer program on the computer, to assist in pooling your information. Using this program, make a web with labels to show the interrelatedness of different parts of the global system.

Third, identify within your web the areas impacted by individuals, communities, and international communities. Once you have this, you are ready to begin to extrapolate the long-term costs of continuing current trends. In other words, you are going to predict what the world will be like in years to come if we keep growing and using resources at the current rates. You should produce charts or graphs to help diagram your predictions that may be used in your video. I recommend using Excel to pool and analyze the data you have collected. This will simplify the charting and graphing.

Fourth, your group is going to make quantifiable adjustments to your predictions to see how the charts or graphs change if your modifications were implemented. Again, save your files for possible use in the final video. You are now ready to begin producing your layout and plan for the final product.

Fifth, create a storyboard and script that outlines your final product. You may use programs like Inspiration to organize your thoughts or a paper and pencil. The goal is to construct a timeline of ideas and images for your video and fully develop the concepts before spending time on the computer producing a video. The images do not need to be finished quality, but are rough sketches that stimulate thought about the concept. This method saves time and energy as well as organizes the final product. Visit the Storyboard Animation website at <http://pblmm.k12.ca.us/TechHelp/Storyboarding.html> to help you with this process. Also, the eMints *Creating Multimedia Products* ©2005 handouts are available to guide you through the process of designing and creating your movies.

Present your ideas as a group to your instructor for approval before beginning to create your movie. Be prepared to answer questions about your storyboard, script, and supporting materials.

Finally, you are ready to produce a video podcast to be put on the school website to inform the community of ways to improve their relationship with the Earth. Your video should meet the following minimum requirements:

- Length: 30 seconds to 5 minutes.
- Visual*: includes at least 10 graphics to convey meaning and gets your message across.
- Audio*: has appropriate audio that adds to the message and is not distracting. (Don't just choose a song because it sounds good. It has to add value to the product.)
- Content: informs others of the effects of human influences on Earth's systems and proposes more than 1 reasonable way individuals can decrease negative impacts on Earth's systems.
- Audience: targets the community members and visitors to the Shead website.
- Title Shot: has an introduction to the video with original and effective title.
- Ending Credits: has a conclusion to the video that directs people to the Eastport Recycling Center – hours of operation Saturdays from 9:00 to 1:00; cites sources of data and information appropriately; credits the work using the following information: "This production created by Mr. Consalvi's Science Students at Shead High School", (do not post your names on the website)

*Be certain not to use copyrighted material. The use of songs and images must be from sources that allow free distribution or are your own creation. Data should be referenced appropriately. Just because it is on the Internet or you can get it does not make it acceptable to use. Songs that have been purchased do NOT give permission to use in multimedia projects for public audiences.

When finished, submit your video to your instructor to be viewed by the class for review. Again be prepared to answer questions and take notes on suggestions to improve your product. You will have one additional week to consider and implement the suggestions before your final grade is given. Each student in the group should be capable of answering the questions and understand the material.

Individually and after the final product is submitted, each student will be responsible for answering three questions in relationship to your final product. These questions will be developed based on your final product and the learning objectives of the assignment so every group member will need to develop their knowledge of the material. The questions will be available on the class Moodle site. Choose the assignment for your group to enter your responses.

Reflection:

Developing the first set of instructions for a particular assessment is always a challenge. The material needs to be complete enough to give clarity to the students of what the task is; however, it also needs to be succinct enough to allow them to be able to use their own creativity to get to the final product. I will be providing an initial training on how to get started with making a movie and will show some student examples for do's and don'ts of production. I fear though that some of the movies will be replications of the examples with different content. These instructions offer the students enough guidance and support for creativity that there will be several original concepts created as well.

As I gave the initial set of instructions to a few students to gain their opinions of the assessment, they were concerned about the development component. That is why I added the day of initial training and evaluation of examples. The other feedback I received was a concern about group projects. There is the difficulty of working in heterogeneous groupings that has some students concerned that their peers will impact their grades. I understand this fear and find it valid. I hope that by selecting the groups according to specific skill sets that students have shown in the past will enable this to be minimized. Also, they will be able to develop the social skills that are needed in the real workplace. Frequently, you are not paired with someone of your own choosing, but you

need to be able to perform the task anyhow. I will be keeping an eye on the groups though to see if modifications need to be made here.

Those were the two primary concerns with most of the feedback being excitement. This points to another difficulty, which will be to keep them focused on the goal and not just the idea of creating a movie. They need to remember to proceed in an orderly fashion through the task to end up at a quality product without wasting a lot of time. Although, they will have personal time to waste and play with the tools if they desire. Unfortunately, I will only have two weeks to devote to the material directly. Fortunately, the concepts carry other material and assessment points indirectly with them. That makes it feasible to devote that much time. Ultimately, I envision this project diminishing the time spent lecturing on ecology topics allowing them to move into more material rather than less.

Application 9.4

Scoring rubrics:

Human Impact Service Announcement Rubric

Process	1 – Does Not Meet	3 – Partially Meets	5 - Meets	7 - Exceeds
Strategic Thinking				
Quantitative data to support ideas and reasoning.	Uses qualitative data or uses quantitative data unrelated to the topic with no valid quantitative data.	Provides quantitative data that is both related and unrelated to the topic.	Provides quantitative data that is related to the topic.	Provides quantitative data that is related to the topic and relates to the data in multiple ways to increase clarity and understanding for the audience.
Data organization	Provides data in random and disorganized manner.	Provides data in tables or charts with missing labels or descriptions.	Provides data in tables, charts, or graphs with proper labels and descriptions.	Provides data in tables, charts, and graphs in multiple ways to increase clarity and understanding for the audience.
Knowledge Construction				
Research – correctly cited.	Provides no primary source information.	Provides 1 primary data source.	Provides 2 primary data sources.	Provides 3 or more primary data sources.
Information analysis	Provides data in its original form only with no analysis or with 2 or more errors in analysis	Provides data in its original form with some analysis with no more than 1 error	Provides data in an original form with analysis and no errors or with extrapolation and only 1 error.	Provides data in more than 1 way with analysis and extrapolation and no errors.
Description of human influences on Earth Systems (ES)	Does not describe any human influences on ES.	Clearly describes 1 human influence on ES or 2+ human influences partially or with minor errors.	Clearly describes 2 human influences on ES with no errors in logic.	Clearly describes 3+ human influences on ES with no errors in logic.
Explains effects of human influences on Earth Systems (ES)	Does not explain the effects of human influences on ES.	Clearly explains 1 effect of human influences on ES or 2+ influences partially or with minor errors.	Clearly explains 2 effects of human influences on ES with no errors in logic.	Clearly explains 3+ effects of human influences on ES with no errors in logic.
Communication				
Uses technology to convey information in a meaningful way.	Provides a partial description of problem addressed with errors.	Provides a product that partially conveys the problem addressed with no errors.	Provides a product that fully covers the problem addressed with no errors.	Provides a product that fully addresses the product in more than one meaningful way with no errors.

Checklist for social skills (assign points 0 – 4)

- 0 – negative behavior.
- 1 – no demonstration of action.
- 2 – showed little demonstration of action with minimal support of peers.
- 3 – showed positive demonstration of action.
- 4 – showed significant, positive demonstration of action with continued support of peers.

- _____ Supported group members and peers.
- _____ Gave constructive praise and criticism to assist others.
- _____ Asked for clarification from peers.
- _____ Carried out roles and responsibilities.

Checklist for carrying out the task (assign points 0 – 2 – 4)

- 0 – no evidence or major distracting errors.
- 2 – minor errors but overall acceptable.
- 4 – no errors or no distracting errors.

- _____ Length between 30 seconds and 5 minutes
- _____ Audio appropriate and enhances final product.
- _____ Visual appropriate and enhances final product.
- _____ Title descriptive and appropriate.
- _____ End Credits meets requirements for citations and conclusion material.
- _____ Audience appropriate and meaningful.
- _____ Overall grammar and communication.
- _____ Completed on-time.

Individual Reflection Questions – 3 @ 4 points each

Total Assessment Value – 100 points

Reflection:

I found the rubric to be one of the most difficult portions of the assignment. This was in part because I am creating this for an assignment myself and want to make sure I am meeting the requirements of my course, but also other reasons. I found it difficult to put the tasks into one specific area. Some of the skills seem to overlap the Strategic Thinking, Knowledge Construction, and Communication areas. Each element is critical for the student to have beyond my classroom and therefore important. It is the primary reason that I find assigning grades so challenging. To focus on scores rather than feedback is counterproductive for some of my students. They will struggle to complete the assignment for fear of the final grade rather than focusing on the task at hand to gain the skills and knowledge.

I chose an analytical rubric with descriptors of each point value to make the scoring easier to understand and succeed. The difficulty here again is the ability to convey enough detail without limiting the students' final products more than intended. I weighted the values of the columns 1 – 3 – 5 – 7 because of the increase importance of these areas for this particular task. Although social skills are important, they are not identified as a necessity for my course and are not to be weighted too heavily for reporting. If there were a means to differentiate between the scores on the report cards, they could be valued equally.

I decided that the only reasonable way to assess social skills was with a checklist. Students will demonstrate this over the duration of the assessment and scores will be tracked by marks on my daily log sheet for students. The task completion skills are not listed in MLRs for this level; however, they are skills demanded of society. Students need to be able to complete tasks according to requirements and in a timely fashion. This is sadly a skill that many of our students lack and is therefore a necessity in every assessment. The three reflection questions are going to

be specific to each project, but designed to encourage every group member to have gained from the experience and be able to communicate those gains.

Application 9.5:

Identified testing constraints:

Time:

One class will be spent learning production skills according to the eMints model. Students will also discuss and evaluate movie examples from other student products.

Students will be given twenty minutes per day for one week to collaborate and research. The remaining 30 minutes of class will be directed towards development of other concepts dealing with population dynamics, limiting factors, biomes and species interrelatedness. During these discussions, students will be asked to reflect on how these components could play a role in their group projects.

The second week will be 50 minutes per day for 5 days for project development. The students will work to develop their concept, evaluate their results, and produce the final products. They will then present the videos to the class the following week and make adjustments if necessary for posting to the web. The final scoring will be based on the product produced for the web and not the class preview.

Reference material

Students will have access to the Internet, school texts, and any materials they supply to assist the project.

Other people:

Students will work in collaborative groups of 3 to 5 selected to offer diverse skill sets such as music, computing, information, analysis, and creativity. They will be required to show professionalism, courtesy, and cooperation with their peers.

Equipment:

Students will have access to computers, digital recording equipment, a SmartBoard, and at least the following software - Inspiration, iMove, Garage Band, iPhoto, Photoshop, Excel, and Google Earth.

Scoring criteria:

Scoring will be based upon the preceding rubrics and converted to a 100 point scale to fit the school reporting schema. There will be a combination of holistic and analytical rubrics to evaluate understanding, processing, and content.

Motivation:

Students are invested in the project because it supports a student-run recycling program in the community. Many also have parents or family members that derive their incomes from the sustainability of the environment.

Reflection:

This seemed to be the least difficult component of the PA development. This is most likely due to the fact that these areas needed to be considered prior to this point. What this added to the process was a way to reflect on what had been done and see if any adjustments needed to be made. I especially had to do this with respect to time. And, I intentionally left time off the task sheet because our schedule has so many disruptions. The timeline for the project will be posted on the Moodle site and within the classroom to allow for adjustments as necessary. In a way, this is a reflection of a reflection.

Application 9.6:

Feedback procedures and ways to learn from mistakes:

Procedures for providing feedback:

Students will be monitored during their research and production stages in the classroom with Remote Desktop. This will enable the instructor to assist and suggest ways to overcome obstacles if student options are exhausted. It will also enable oversight to ensure students remain on task.

Students will be able to use the Moodle website to create their scripts and collaborate outside of the classroom. This is also a means to solicit feedback from their instructor and peers.

Students will be required to present their scripts and storyboards in a group discussion setting. At this time, they will be given direct feedback from their instructor that will lead them back to the draft phase or onto the video production phase.

Finally, students will present their videos to the class. They will be given written and oral feedback from their peers. They will again be given a chance to edit their products before final submission.

Suggestions that will help them improve and learn from their mistakes:

Students will be given multiple opportunities to collaborate, communicate, and coordinate. They will be given oral and written feedback to highlight areas where improvement can be made and strengths that should be promoted.

Reflection:

I intend to have students continually assessing their progress and reassessing their progress in the discussions at the beginning and end of class. They will also be able to communicate over the Moodle website to share in and out of groups. And, they will be able to revise their project right up to the final upload to take advantage of suggestions. The ultimate goal is to have them develop and learn. They will be able to do this best by having opportunities to revise their work and collaborate.

A component of the process that was not included is the assessment of the assessment. For a project that encompasses so much effort, I will be having students complete surveys of the process and materials. This will be a way for me to improve my teaching and the PA. My students are accustomed to being able to express their opinions without hurting my feelings assuming they are being constructive in their approach. So, I typically receive good suggestions. This is what happened when I had students read over my first drafts of the project. It also gives them another learning opportunity to see that even their instructors are not perfect and everybody goes through the same development steps when designing products.

Cumulative Reflection:

This development process was a bit cumbersome to use for every assessment. I found that it took a lot of time focusing on terminology rather than content. I struggled to put things into the proper heading because I could rationalize them fitting into multiple categories. An example is the data component of the rubric. It could very easily be a component of Strategic Thinking or Knowledge Construction. The understanding that I settled into is that it really does not matter that much so long as it does fit. The concepts being scored are ultimately a part of what is being learned and assessed. This idea fits closely with the constructivist learning theory that I support. Students will learn and may be assessed during the learning process better if they are developing meaningful products in meaningful ways. They will ultimately improve their cognitive skills by learning the processes as well as the content.

I believe that a combination of this process for developing assessments and the ADDIE model offers a great combination tool for educators. The ADDIE model incorporated more strategies to predict possible difficulties and set up options should they arise. This process however seemed to focus on the process component of the students learning more. Together they seem like a perfect

melding of developmental models. In the future, I anticipate using them together to develop material.