

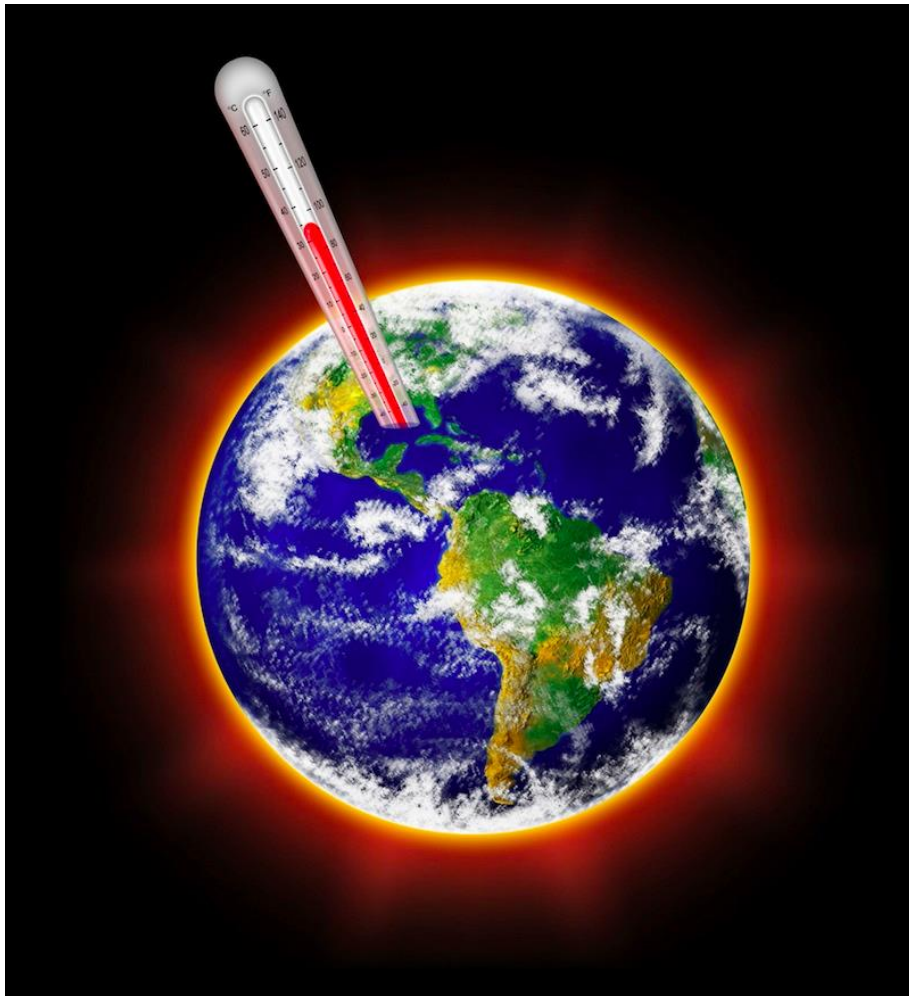
EDIT 730 – Final Project Proposal Outline

Designing a Constructivist Learning Environment (CLE)

Global Warming

By

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1. Learning Problem

Global warming is a complex global issue, which has been the subject of many conferences among nations with very little progress. It also affects almost every living being on planet earth to some degree. It has claimed many lives in the past and has cost nations billions of dollars, yet some governments, organizations, or even scientists do not believe such a thing exists.

The complex nature of this subject, which can be called a dilemma, matches Cognitive Flexibility Hypertext (CFH) model the most. CFH has been chosen as the CLE model to allow students to analyze and evaluate multiple cases in this complex topic from many perspectives and themes. A blog is also setup for students to post their reflections on certain topics, read posts from other students and provide comments. Such a learning environment will allow them to develop better understanding of this complex issue and prepare them to deal with complex issues in the future.

2. Target Audience

The target audience for this CLE course are groups of selected high school seniors located in Northern Virginia. These students are self-motivated and want to take part in this pilot program, which is aimed at exposing high school students to real-world issues before they graduate. Another motivation for them is to go on a field trip to the latest Smithsonian exhibit, which is about global warming and its effects on all living creatures.

The selection criteria starts with a survey about student's present knowledge about global warming. Faculty in charge will then select a group of 20 students who know the least about global warming to take this class. The class is 4 weeks long and fully an online class. Students need to have access to a computer with internet connection, either at home or school, and be able to navigate through web pages. During the course of this class students are asked periodically to do blog posts on given subjects and comment on two other student's blog posts.

3. General Knowledge Domain

There are interdisciplinary knowledge domains included in the global warming dilemma. Here is a list of the main knowledge domains:

- Weather system and what natural and manmade factors affect it
- Role of politics and big companies in global warming
- Economical aspects of dealing with global warming
- Global warming effects on human lives and economy
- Global warming effects on environment and ecosystem
- How technology can be used to combat global warming

Usually high school students do not get exposed to these knowledge domain. By using the CFH model, the students will not only get exposure to these domains, they will also get to know them from different perspectives. These perspectives are organized inside cases and each case can be associated with multiple themes. This crisscrossing of perspectives, cases, and themes provides the student with a more holistic learning experience. Not everything about global warming would fit inside this CLE. Links are provided to valuable sources outside, which provide a wealth of interconnecting knowledge.

Evaluating a dilemma like "global warming" requires reasoning skills, accommodation of multiple perspectives and use of argumentation skills, critical thinking skills, problem solving skills, and to use the high level of epistemology development. Learners will be able to navigate through multiple perspectives by crisscrossing cases to determine the nature of the problem and to examine alternative solutions. Furthermore, students will compare the differences and similarities between cases. Learners will access these cases in a nonlinearly manner, and at different time. They will obtain information from the alternative perspectives and themes in order to construct their arguments to support their interpretation of the proposed meaningful solutions of the global warming.

4. Learning Outcome

Highest level of Bloom's taxonomy (Evaluation) is used as the method to reach learning outcomes in this course, which means it contains elements from the other levels like knowledge, understanding and analysis.

In this CLE model students will:

- Increase awareness about global warming issue
- Evaluate the global warming controversy
- Compare different perspectives on global warming
- Appraise how Global Warming affects lives all over the globe
- Correlate political and economical aspects of Global Warming
- Support the knowledge construction with validated researches and scientific evidence
- Synthesis their understanding about the phenomenon
- Justify and reason the interpretation and meaningful solution
- Prioritize the urgent actions to be taken in the next ten years to combat the phenomenon
- Construct critical thinking to deal with and evaluate multi-faceted dilemmas in the future

5. Pedagogical Model

Global Warming is a very complicated and controversial subject. It involves every life form on earth, yet governments and even scientific organizations have not been able to come to a mutual understanding on what causes it and how to deal with it.

There are many factors involved in global warming controversy such as political and financial gain / loss, who is responsible for it, and who should be responsible for fixing it. Some have even mixed it with religion and faith, which makes global warming even more complex. Factors like these have turned global warming into a huge dilemma for the whole planet.

Due to the large number of perspectives to be considered in this dilemma, CFH model was chosen as the most suitable pedagogical model for this. It should also be noted that all of the above information could not be presented in a linear manner, making CFH even a more suitable model because information must be presented in a nonlinear manner in CFH model.

6. Learning Activity

The learning activity in a CLE should closely match the model specifications. The following table shows the main characteristics of a CFH model and its matching activities.

CFH Model Characteristics	Learning Activities
Offer multiple perspectives	Explore various points of view such as scientists, economists, politicians, industries, climatologists, and even common people.
Thematic Linking across cases	Access content based on various themes like: <ul style="list-style-type: none">• Facts and causes• Political aspects• Economical aspects
Emphasizing domain complexity	The information is presented in a nonlinear manner allowing students to move freely from one case to another case or from one theme to another. They can even view unrelated perspectives as they wish. This will help students grasp the complexity of global warming issue.
Emphasizing web-like nature of knowledge	The content is organized in a three dimensional model made up of themes, cases, and perspectives. Student can access and examine the content in any pattern they wish to use. This will help students

	gain a more holistic of the issue. This kind of knowledge presentation can only be done using a website.
Encourage construction of knowledge	Special care was taken to just present various perspectives without passing any judgments. The construction of knowledge is left to student and will take place during: <ul style="list-style-type: none"> • Multiple blog posts • Reading other blog posts • Replying to other blog posts • Final Survey • Final Project
CFH characteristics adapted from Jacobson, M., & Spiro, R. (1995) "Hypertext learning environments, cognitive flexibility, and the transfer of complex knowledge: an empirical investigation." Journal of Educational Computing Research 12(4), 301-333.	

7. Assessment

Constructivism learning environment under CFH promotes learners to own the learning process and to regulate and control their own learning. Therefore, learners will be assessed by the following methods:

Initial Survey (Pre-Assessment): Student will fill a survey before starting this class. On the initial survey student's knowledge and familiarity with global warming is collected.

Blog Posts: Students are given specific subjects to research and do a blog post at different times during this class. They are also asked to read other student's blog posts and comment on at least two of them.

Final Survey (Post-Assessment): Students will do another initial survey at the end of this class before completing the final survey. This final survey will have questions regarding the material presented for this class.

Final Project: At the end of the class, students are asked to write a two page summary about global warming and what solutions do they propose for the next ten years.

The following table demonstrates how each of the evaluation method corresponds with learning outcome:

Evaluation	Learning Outcomes
Initial Survey	<ul style="list-style-type: none"> • Increase awareness about global warming issue
Blog Posts	<ul style="list-style-type: none"> • Support the knowledge construction with validated researches and scientific evidence • Evaluate the Global Warming controversy • Compare different perspectives on Global Warming • Appraise how Global Warming affects lives all over the globe • Correlate political and economical aspects of Global Warming • Synthesis their understanding about the phenomenon
Final Survey	<ul style="list-style-type: none"> • Increase awareness about global warming issue • Evaluate the Global Warming controversy
Final Project	<ul style="list-style-type: none"> • Synthesis their understanding about the phenomenon • Support the knowledge construction with validated researches and scientific evidence • Justify and reason the interpretation and meaningful solution • Prioritize the urgent actions to be taken in the next ten years to combat the phenomenon • Construct critical thinking to deal with and evaluate multi-faceted dilemmas in the future

Design Table

CFH Model Characteristics	Learning Outcomes	Learning Activities	Evaluation
Offer multiple perspectives	<ul style="list-style-type: none"> • Increase awareness about global warming issue • Evaluate the Global Warming controversy • Compare different perspectives on Global Warming • Appraise how Global Warming affects lives all over the globe • Correlate political and economical aspects of Global Warming • Synthesis their understanding about the phenomenon 	<ul style="list-style-type: none"> • Explore various points of view such as scientists, economists, politicians, industries, climatologists, and even common people. 	<p>Final Survey: Students will elaborate on how their views have changed from the initial survey after they completed navigating the cases and thematic perspectives.</p> <p>Blog posts: Various perspectives have to be read to properly respond to blog questions such as:</p> <ul style="list-style-type: none"> • Have you been affected by the climate change? • What do you think the causes are? <p>Students will be encouraged to read latest blog post and post at least one comment. Also, they will be encouraged to reply to their classmates' comments.</p> <p>Final Project: At the end of the class, students will be asked to write a two-page summary about global warming and what can be done about it. They will also prioritize urgent actions should be taken on the next ten years.</p>
Thematic Linking across cases	<ul style="list-style-type: none"> • Increase awareness about global warming issue • Appraise how Global Warming affects lives all over the globe • Correlate political and economical aspects of Global Warming • Synthesis their understanding about the phenomenon 	<p>Access content based on various themes like:</p> <ul style="list-style-type: none"> • Facts and causes • Political aspects • Economical aspects 	<p>Blog posts: There is a blog post for each theme. (See above).</p>
Emphasizing domain complexity	<ul style="list-style-type: none"> • Increase awareness about global warming issue • Evaluate the global warming controversy • Appraise how global warming affects lives all over the globe 	<p>The information is presented in a nonlinear manner allowing students to move freely from one case to another case or from one theme to another. They can even</p>	<p>Initial Survey: Questions on the initial survey will make students realize the complexity of this issue.</p> <p>Blog Posts: Students will comment to multiple blog posts.</p>

	<ul style="list-style-type: none"> • Correlate political and economic aspects of global warming • Synthesis their understanding about the phenomenon • Justify and reason the interpretation and meaningful solution • Construct critical thinking to deal with and evaluate multi-faceted dilemmas in the future • Support the knowledge construction with validated researches and scientific evidence 	view unrelated perspectives as they wish. This will help students grasp the complexity of global warming issue.	<p>Final Survey: Students will elaborate on how their views have changed from the initial survey.</p> <p>Final Project. (see above)</p>
Emphasizing web-like nature of knowledge	<ul style="list-style-type: none"> • Synthesis their understanding about the phenomenon • Construct critical thinking to deal with and evaluate multi-faceted dilemmas in the future. 	The content is organized in a three dimensional model made up of themes, cases, and perspectives. Student can access and examine the content in any pattern they wish to use. This will help students gain a more holistic of the issue. This kind of knowledge presentation can only be done using a website.	Blog Post: Students will comment to multiple blog posts.
Encourage construction of knowledge	<ul style="list-style-type: none"> • Support the knowledge construction with validated researches and scientific evidence • Construct critical thinking to deal with and evaluate multi-faceted dilemmas in the future. • Justify and reason the interpretation and meaningful solution. • Prioritize the urgent actions to be taken in the next ten years to combat the phenomenon 	<p>Special care was taken to just present various perspectives without passing any judgments. The construction of knowledge is left to student and will take place during:</p> <ul style="list-style-type: none"> • Multiple blog posts • Reading other blog posts • Replying to other blog posts • Final Survey • Final Project 	<p>Blog Post: Students will comment to multiple blog posts.</p> <p>Final Survey: Students will response to the survey at the end of the course.</p> <p>Final Project</p>

Prototype

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