Clean coal rhetoric: engaging the public on informal education websites about science and technology

David M. Niedergeses
Iowa State University

Follow this and additional works at: https://lib.dr.iastate.edu/rtd

Part of the English Language and Literature Commons, Instructional Media Design Commons, Library and Information Science Commons, Online and Distance Education Commons, Rhetoric and Composition Commons, and the Science and Mathematics Education Commons

Recommended Citation
https://lib.dr.iastate.edu/rtd/15071

This Thesis is brought to you for free and open access by the Iowa State University Capstones, Theses and Dissertations at Iowa State University Digital Repository. It has been accepted for inclusion in Retrospective Theses and Dissertations by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.
Clean coal rhetoric: Engaging the public
on informal education websites about science and technology

by

David M. Niedergeses

A thesis submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

Major: Rhetoric, Composition, and Professional Communication

Program of Study Committee:
Rebecca E. Burnett, Major Professor
Lee B. Honeycutt
Ron M. Nelson

Iowa State University
Ames, Iowa
2007

Copyright © David M. Niedergeses, 2007. All rights reserved.
# TABLE OF CONTENTS

List of Figures iv  
List of Tables v  
Acknowledgments vi  
Abstract vii  

Chapter 1: Energy and the Growing Connection Between Science and Culture  
  IGCC: Technological Problems in Human Discourse 3  
  Global Climate Change and Inexpensive Energy 4  
  Clean Coal: One Answer to Global Climate Change 5  
  Rhetorical Dimension of Clean Coal 7  
  Studying Informal Education Websites 9  

Chapter 2: Engaging Non-specialized Audiences on Informal Education Websites  
  Two Discourse Communities: Science and the Public 12  
  Boundary Objects and Informal Education Websites 13  
  Elements of Online Communication 14  
  Focusing On Engagement 16  
  Multiple Disciplines Converge on Engagement 22  

Chapter 3: A Three-Part Methodology 24  
  Circumstances of the Study 24  
    Website Elements to Study: Engagement 24  
    Artifacts for Testing 26  
    Research Participants 27  
  Study Design 27  
    Critical Analysis 27  
    Survey Design 28  
    Interview Design 30  
  A Three Part Study of Engagement Elements 31  

Chapter 4: Analysis of Informal Education Website Engagement Elements 32  
  Preliminary Analysis 32  
  Engaging Elements on Two Websites 33  
    Artifact 1: The Coal Energy Portal 34  
    Artifact 2: Learnaboutcoal.org 41  
  Summary of Critical Analysis of Engagement Elements for both Websites 51  

Chapter 5. Study Results 52  
  Response to Engagement Elements 52
LIST OF FIGURES

Figure 3.1 Nearly Identical Content 26
Figure 3.2 Content on IGCC 29
Figure 4.1 The Coal Energy Portal Front Page 34
Figure 4.2 Typography on the Coal Energy Portal 35
Figure 4.3 Images on the Coal Energy Portal 36
Figure 4.4 Motion on the Coal Energy Portal 36
Figure 4.5 Missing Motion on the Coal Energy Portal 37
Figure 4.6 User-generated content on the Coal Energy Portal 38
Figure 4.7 Hypermediacy on the Coal Energy Portal 40
Figure 4.8 The Learnaboutcoal.org Front Page 41
Figure 4.9 Typography on Learnaboutcoal.org 42
Figure 4.10 Images on Learnaboutcoal.org 43
Figure 4.11 Drop Down Menus on Learnaboutcoal.org 44
Figure 4.12 Full Motion on Learnaboutcoal.org 45
Figure 4.13 User-generated Content on Learnaboutcoal.org 47
Figure 4.14 Hypermediacy on Learnaboutcoal.org 48
Figure 4.15 Human Personality on Learnaboutcoal.org 49
Figure 4.16 Human Personality on Learnaboutcoal.org’s Commercials 50
Figure 4.17 Human Personality on Learnaboutcoal.org as Commentary 51
Figure 5.1 Motion Amount Affect 53
Figure 5.2 Motion Quality Affect 54
Figure 5.3 Sound Amount Affect 55
Figure 5.4 Sound Quality Affect 56
Figure 5.5 Personality Amount Affect 58
Figure 5.6 Personality Quality Affect 58
Figure 5.7 Opinion of Coal 61
Figure 5.8 Support for Research 61
Figure 5.9 Familiarity with Entity 63
Figure 5.10 Opinion of Entity 64
Figure C.1 Coal Energy Portal Front Page 116
Figure C.2 Coal Energy Portal Carbon Sequestration Page 117
Figure C.3 Learnaboutcoal.org Front Page 118
Figure C.4 Learnaboutcoal.org Carbon Sequestration Page 119
LIST OF TABLES

Table 1.1 Two websites take different approaches to presenting the same content 8
Table 2.1 A selection of important website elements 15
Table 3.1 Test Variables for Motion, Sound, and Personality 29
Table 4.1 Preliminary Analysis of Two Websites 33
Table 4.2 Engagement Elements Being Tested 33
Table 4.3 Two websites that take different approaches to presenting the same content 34
ACKNOWLEDGMENTS

The research found in these pages is the result of a good deal of hard work, and not all of it was mine. I would like extend my deepest gratitude to everyone who contributed to this project, beginning with my committee chair, Dr. Rebecca Burnett. Without her patient mentoring and insightful criticism this project could not have succeeded. I must acknowledge the help of the scholars and scientists who either offered their advice or contributed to my academic preparation for this undertaking, including Dr. Lee Honeycutt, Dr. Ron Nelson, and Dr. Carl Herndl. Thanks are also due to Elizabeth Beck and the Iowa State Honors Program for supplying willing test participants.

Most importantly, I am deeply appreciative for all the care and understanding extended to me by my family and friends for the last year and a half. Thank you all.
Some scientific and technological problems require public engagement. Engagement, defined in this situation as a level of interest or investment that fosters changing attitudes and behavior, can be achieved through informal education websites that present scientific arguments to a general audience. These websites function as boundary objects between the scientific community and the general public, noticeably affecting the audience’s attitudes and opinions about the science in question.

This study focuses on several website elements stimulating engagement on two informal education websites that present clean coal technology, an advanced effort to increase the efficiency of coal power while capturing coal power’s greenhouse gas emissions. Informal education websites about clean coal technology are challenged to supplant the public’s misgivings about coal with acceptance and even excitement.

To examine the ways in which these two websites attempt to engage their audiences and the ways in which those audiences respond, this study uses three methods. The first is a rhetorical analysis of the engaging elements present on the websites. The second is a user survey that collects data about a test audience’s response to those engaging elements. The last is an interview process designed to collect further detail about individual survey participants’ reactions.

Generally, the study found that even if users react negatively to specific website elements, they are often willing to separate that reaction from their response to the information presented. The results suggest that website elements designed to engage the audience might be useful as long as they do not obstruct the audience’s access to content they find interesting.

The results of the study further suggest methods to refine the study of audience engagement as a goal of online communication.
CHAPTER 1: ENERGY AND THE GROWING CONNECTION BETWEEN SCIENCE AND CULTURE

Energy is the single most important foreign and domestic policy issue since the end of the cold war. The last decade has seen a marked intensification in the debate over energy. For example, the Energy Information Association reports that in the 10-year period from 1995 to 2005, greenhouse gas emissions from human sources increased 11.7 percent. In 1998, the World Meteorological Association and the United Nations Environment Programme established the Intergovernmental Panel on Climate Change (IPCC) to study the causes and effects of climate change. The organization, made up of thousands of scientists from countries all over the world, concluded in early 2007 that average global surface temperatures have risen by more than 1°C and will continue to rise by 0.2°C per decade (Intergovernmental Panel on Climate Change, 2007, p. 10). More important, the IPCC ties this increase to the higher instance of human-caused emissions of greenhouse gases. Even when compared to less than a decade ago, the danger of global climate change has for now become stable knowledge (Schryer, 1993) in the scientific community.

During roughly the same 10-year period, the percent of Americans who believed that a consensus exists among scientists that global warming exists and could damage human society grew from 28 percent to 43 percent. By 2005, the percent crossed the halfway point (Kull, Ramsey, Stefan, Weber, & Lewis, 2005, p. 4). Evidence of the solidification of global climate change as stable knowledge can also be found in many cultural artifacts. The most recent and most prominent example is the documentary film An Inconvenient Truth featuring former U.S. Vice President Al Gore, winner of the 2006 Academy Award for Best Documentary. Socio-cultural concerns about global climate change seem to be growing.

The international debate over energy is just one indicator of the conflux of science and technology with human culture. Cheap energy fuels our economy. Our refrigerators, computers, SUVs, PDAs, and airliners all depend on energy. Our culture is defined by these artifacts. Foregoing some of them would be very costly; they give us convenient ways to work and live that add to our productivity and general welfare. But while they are necessary to maintain our standard of living, these things themselves consume resources. Just as computers fuel our economy, coal fuels our computers. And coal is increasingly seen as part of a greater scientific and cultural problem. Coal energy is one of the driving forces behind our economy and one of the greatest threats to our future wellbeing.

How can the scientific community mitigate a problem that seems to come from human culture itself? How can members of the general public who lack the specialized
knowledge of the scientific community decide to make changes in their everyday lives? The answer to these questions may be improving the communication that crosses the boundary (Star & Griesemer, 1989) between the scientific community and the general public.

As human culture becomes more technological, the boundary between scientific problems and cultural problems blurs (Latour, 1993). Contemporary science—like energy research—intimately involves the general public. Because scientific research increasingly requires support and conformity from the general public, good communication between the scientific community and the general public is vital. This thesis examines boundary-crossing discourse between the scientific community and the general public from a rhetorical perspective.

Rhetoric, the analytical study of arguments and persuasion, offers productive strategies for addressing the difficulties of communication that arise when scientific problems cross into the public realm. Like any artifact of communication, these boundary-crossing artifacts perform several rhetorical tasks simultaneously:

- Artifacts inform their audiences.
- Artifacts persuade their audiences.
- Artifacts engage their audiences.

The artifacts are overtly informational, designed to increase knowledge in the audience. They must also be persuasive, especially in the case of controversial scientific topics like global climate change and energy generation, where personal attitude matters a great deal. Finally, they need to be engaging, evoking active changes in attitudes and practices and seeking further interaction from the audience.

My thesis focuses on the boundary-crossing discourse that occurs in one technology currently under development—Integrated Gasification Combined Cycle (IGCC) power, or “clean coal”—which has the potential to help reduce greenhouse gas emissions that contribute to the societal problem of global climate change. To better understand the communication that occurs between the scientific community and the general public in this case, I analyze and test two websites about clean coal technology with a particular emphasis on engagement. These websites are examples of what the National Science Foundation calls “informal education”—programs designed to increase the general population’s knowledge and awareness of funded research. Examining the most prominent engaging elements on each website and the ways in which the audience responds to those elements helps explain how the scientific community uses boundary objects in this instance to engage the general public in scientific problems.
Integrated Gasification Combined Cycle power plants are different from common coal-fired facilities. They are potentially more efficient and cleaner than their counterparts. This puts IGCC power near the core of the United States energy debate. Because they are part of both a cultural debate and a scientific research and development program, IGCC plants depend on communication between the scientific community and the general public. Understanding the problem requires background both about the technology and about the rhetorical implications of communication between the scientific community and the general public. To build this background, I first discuss the technological problem of global climate change and the ways in which IGCC power plants are a part of it. Second, I describe the rhetorical implications of boundary-communication. Third, I discuss how these rhetorical implications are present in informal education websites. My goal is to show how these websites act as boundary objects to engage the general public in the technological problem of global climate change, especially as it is addressed by clean coal technology.

**IGCC: Technological Problems in Human Discourse**

While the general public is becoming more aware of the danger of global climate change, most members of the general public are less informed about individual solutions to that problem. This is not surprising, since climate change is a problem of massive scope, and any solution to it must necessarily be a partial solution (Pacala & Socolow, 2004). One partial solution is the Integrated Gasification Combined Cycle Power Plant. Until recently, IGCC was an obscure research track in energy generation. I first encountered the technology in a single paragraph of a power systems electrical engineering textbook as a baccalaureate student in 2003. Even among specialists, IGCC is a specialized field.

While IGCC technology can be considered esoteric, coal and coal energy is well known to the general public. Furthermore, coal suffers a very negative public image. Coal energy is seen as an ominous cloud left over from the industrial age (Davis, 1982). This image is slowly changing. To understand the ways in which the public is building knowledge about the possibility of clean coal, I start with a discussion about why coal is an important energy source despite its drawbacks. Then I explain the technology used in Integrated Gasification Combined Cycle power plants. Finally, I discuss the rhetorical task of moving the general public from awareness of coal as an important energy source to an awareness of Integrated Gasification Combined Cycle power plants.
Global Climate Change and Inexpensive Energy

The United States is home to the highest energy users on the planet. With 5 percent of the world population, the U.S. consumes 22.5 percent of the energy produced annually (U.S. Energy Information Administration, 2005a, p. 302). As India and China develop, they are expected to dramatically increase worldwide energy consumption. Currently, the United States generates much of its energy from domestic coal reserves. Given the threat of global climate change, burning coal would seem to be unwise, but for a variety of reasons that I discuss, coal power isn’t widely accepted or understood as an important source of energy.

Global Climate Change

French physicist and mathematician Joseph Fourier identified the greenhouse effect in 1827. Then, in 1904, a Swedish scientist named Svente Arrhenius suggested that greenhouse gases specifically from human activity could affect the global climate (Crawford, 1996). However, Arrhenius and his successors, through the 1960s, never had enough tangible evidence to prove the theory. While global climate change remains a disputed topic, historical data verify that climate change correlates to greenhouse gas emission. Despite strong empirical evidence (Intergovernmental Panel on Climate Change, 2007), politicians, scientists, industry, and the public still disagree about at least three questions:

- How much does human activity contribute to climate change?
- What can be done about it?
- How does it compare to legitimate economic concerns?

What is not disputed is the public’s opinion of global climate change. In a National Science Foundation survey in 2001, 86 percent of U.S. adults believed that global warming is a “somewhat serious” or a “very serious” problem (U.S. National Science Foundation, 2001, ch. 7 p. 29). These survey results are part of a growing body of evidence that the public accepts global climate change as a scientific and political issue (Krosnick, Holbrook, Lowe, & Visser, 2006).

Availability of Coal

Now that global climate change seems to be on many people’s political agenda, the nation must reconsider the environmental impact of its energy infrastructure. For example, more than half of the nation’s electricity is produced by burning coal. Coal is a desirable source of energy for the United States because of its abundance and accessibility. Most estimates suggest that at current levels of consumption and without finding any new reserves, coal resources will last about 180 years (U.S. Energy Information Administration, 2006, p.
The availability of coal makes it very inexpensive. However, burning coal produces carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. All of these byproducts contribute to the greenhouse effect, are highly toxic, or both.

While coal energy is environmentally hazardous, the alternatives have their drawbacks as well. Nuclear power creates radioactive waste that must be stored indefinitely. Natural gas is more expensive than coal, and while cleaner, it still emits carbon dioxide and other pollutants (U.S. Energy Information Administration, 1999, p. 50). And while most people stress the cleanliness and renewability of hydrological and wind power, these sources are limited by availability and carry their own, sometimes severe environmental drawbacks. All of these technologies have a place in U.S. energy policy, but none completely replaces coal. Given America’s appetite for energy and the cultural drive to limit greenhouse gases, the nation must once again turn to technology to satisfy its needs.

Even though burning coal contributes to global climate changes, it will continue to be a key part of the world’s energy solution. Because coal is very available and very economical, it fills a large gap that is not easily replaced. But is global climate change an inevitable consequence of coal power? Perhaps not. The U. S. Government and the coal industry are researching methods of extracting the energy from coal more efficiently and with less environmental impact. They argue that one of these methods—Integrated Gasification Combined Cycle Processing, also known as clean coal technology—could make coal a cleaner energy source.

Clean Coal: One Answer to Global Climate Change

Clean coal technology might satisfy both the need for abundant and inexpensive energy and the desire to reduce greenhouse gas emissions. Simply put, clean coal technology can improve energy efficiency and decrease environmental pollution. It represents a method completely different from the one used historically to release the energy from coal, based on three advanced technologies—gasification, combined cycle power, and carbon sequestration. Because clean coal technology depends on these two technologies working together, the scientific community refers to clean coal technology as Integrated Gasification Combined Cycle, or IGCC.

The “gasification” in IGCC refers to the means of combusting coal. In a traditional coal-fired power plant, coal is pulverized into particles and then burned in a furnace. The furnace heats a boiler, which drives a steam turbine. Waste gas products and fly ash are either captured or expelled through a smoke stack. Gasification works differently. Instead of
burning coal dust directly, a gasifier heats the carbon fuel to release syngas—a combustible mix of mostly hydrogen and methane—along with waste gases and trace pollutants. Since the pollutants are released in a gaseous state prior to combustion, separating them and storing them is theoretically easier than in a traditional coal plant. If gasification were implemented on a large scale, it could vastly reduce emissions from coal power generation.

“Combined cycle” indicates that two thermodynamic processes are used to generate electricity at the same time. Traditional coal power plants use three energy conversions:

1. Chemical energy from coal is changed to heat by combustion.
2. Heat energy operates a boiler to produce high pressure.
3. Steam pressure is used to run a turbine to generate electricity.

Since an IGCC plant uses gaseous fuel, it drives a combustion turbine directly. This leaves the excess heat free to run a steam turbine. Both turbines produce electricity, greatly increasing the efficiency of the heat-electricity conversion. Currently available IGCC plants are roughly 25% more efficient than standard coal plants, and promise further gains (Beér, 2006, p. 132).

The last key component technology is carbon sequestration. Carbon monoxide or carbon dioxide is always released by burning any organic material, including all fossil fuels. While CO₂ contributes less to global climate change per liter than other greenhouse gases, roughly a billion metric tons of the gas are released each year (U.S. Energy Information Administration, 2005b, p. 1). Carbon sequestration research is a relatively recent attempt to capture carbon emissions and prevent them from mixing with the rest of the atmosphere. Carbon can theoretically be stored in underground reservoirs or locked in to organic material. Of all the advanced technologies used by clean coal, carbon sequestration is the least well developed. Little evidence is available to show that carbon sequestration is feasible on a large economic scale (Metz, Davidson, de Connick, Loos, & Myer, 2005, p.171).

While carbon sequestration is not a proven technology, most of the other components of clean coal power are fairly stable. Scientists have been playing with the flammable syngas released by heating coal for centuries, and the combined-cycle process has been around for decades. Nothing is technically or financially prohibitive about any of this technology. Even though carbon sequestration is still in development, IGCC power plants are clear improvements over traditional coal-fired power plants. Some pilot plants already use this technology, such as the Polk Power Station in Tampa Florida (Folger, 2006, p. 2), but no financially independent, large-scale IGCC plants currently operate or are planned in the United States.
Currently, the U.S. Department of Energy supports a joint industry project to demonstrate the economic viability of IGCC electricity generation on a large scale. The project, known as FutureGen, is currently in its design phase and promises to provide economically competitive electric power from coal using IGCC technology. Furthermore, it will combine IGCC technology with carbon sequestration. If it is successful, FutureGen will be the first large-scale, zero-emission coal power plant.

IGCC plants like FutureGen may be clear improvements, but several cultural obstacles prevent implementation. One obstacle is economics. Power plants are not short-term investments. A city or utility that decides to build one makes a decades-long commitment to contemporary technology; coal plants are licensed for 40 years at a time (U.S. Energy Information Administration, 1998, p. 29). Another reason is a lack of economic impetus. IGCC plants, while more efficient than their predecessors, are more expensive to build. Overcoming these kinds of social obstacles is partly a rhetorical problem.

**Rhetorical Dimension of Clean Coal**

If the coal and energy industries do not find IGCC technology lucrative enough to justify implementation, scientists and engineers must appeal to a higher power. The general public, by choosing politicians carefully, could support IGCC development in many ways. The most popular among industry and the government is a cap-and-trade system, which is designed to allow economic forces to determine ways to implement new technology (Clean Energy Group, 2003). While many industry representatives support such a system, they debate details of implementation. Merely asking the public to make judgments about IGCC forces a general audience to judge the costs, risks, and benefits of a specialized technology against any number of other possible research projects—such as wind generation or bioethanol—that might benefit the environment or society more. Exposing the public to arguments about clean coal could have ancillary effects as well; users might be lulled into a false sense of eco-security by the promise of clean coal. They could end up consuming more energy, negating any benefit from IGCC.

The generation and consumption of energy—and therefore energy research—has serious human and environmental consequences. Therefore, these are not just political decisions, but moral decisions. Everyone involved in decisions such as these has a civic responsibility to make those decisions in good faith. However, members of the general public cannot know exactly what information they need; thus, the responsibility of educating rests with the scientific community. In a very real sense, the public hires scientists to develop and
employ the expertise that members of the public cannot have; in return, the public should expect knowledge that is accessible, comprehensible, and useful.

This knowledge debt can be paid in a number of ways. Scientific research and technological development are brought to the public in popular science magazines, newspapers, television, and on the Internet. The Internet is a particularly interesting because it is highly accessible, it targets a diverse audience, and it can offer direct interaction between the scientific community and the general public. Because of these reasons, websites are an appealing medium for informal education.

Informal education websites designed by the scientific community about technical topics like clean coal technology must perform several tasks to be effective:

- They must provide information to build knowledge.
- They must provide persuasive arguments to influence attitudes.
- They must provide engaging means to involve the public.

My thesis focuses on the third of these three rhetorical goals. To study engagement in this thesis, I examine two informal education websites about clean coal technology. While the sites have similar content, they take different approaches to engaging their audience (see Table 1.1). These two websites are boundary objects that straddle the scientific community and the general public. They fill a communication gap, enabling the general public to understand and act on scientific information about power generation with clean coal technology and about global climate change.

Table 1.1 Two websites take different approaches to presenting the same content

<table>
<thead>
<tr>
<th>Publishing entity</th>
<th>Website title</th>
<th>Website URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Americans for Balanced Energy Sources</td>
<td>Learnaboutcoal.org</td>
<td><a href="http://www.Learnaboutcoal.org">http://www.Learnaboutcoal.org</a></td>
</tr>
</tbody>
</table>

Informal Education Websites Address the Communication Need

From the perspective of the scientific community, an informal education website that effectively communicates to the public about scientific research and technological development can meet three rhetorical goals mentioned above—informing, persuading, and engaging the public. Since these three goals are rhetorical, authors of informal education websites about science and technology naturally employ rhetorical strategies and identifiable communication elements. Whether these elements are included in the website consciously, unconsciously, or accidentally, they can be identified by comparing the solutions embodied in the websites against communication theory and rhetorical analysis.
Because I argue that engagement is an important goal for informal education websites, I assess two selected websites about clean coal technology to see what engagement elements they use and how website users respond. I speculate that sites that employ engagement elements well are more likely to successfully build knowledge and opinions about science and technology in the general public and, therefore, are more likely to produce high-quality public decisions.

**Studying Informal Education Websites**

Because engagement seems to be critically important in informal education websites, in my thesis, I seek to answer two specific research questions:

- What website elements affect the public’s engagement in addressing major technological problems such as energy need?
- How does the public respond to those elements?

To answer these research questions, I analyzed and tested two artifacts—The Department of Energy Coal Energy Portal and Americans for Balanced Energy Choices Learnaboutcoal.org. As a starting point, I looked at the websites themselves and conducted a rhetorical analysis to identify elements that affect the public’s engagement. Then I conducted user testing to determine ways in which selected members of public respond to those elements. Finally, I conducted user interviews to provide more individual details. My discussion of the problem, the review of literature, an explanation of methodology, analysis and testing, and suggested implications are separated into six chapters.

**Chapter 1: Energy and the Growing Connection Between Science and Culture**

I begin the study with an examination of the scientific and cultural problem of global climate change and the ways in which that problem might find a partial answer in Integrated Gasification and Combined Cycle power generation. I then describe how informal education websites play a role in the research and development on which the technology depends. Finally, I suggest that studying informal education websites is a necessary part of this process.

**Chapter 2: Engaging a Non-specialized Audience with Informal Education Websites**

To identify the important website elements that I discuss in Chapter 4, in Chapter 2 I review communication theory important to informal education websites. This theory draws on a number of traditions, including rhetoric, technical communication, human-computer interaction, computer science, and graphic design. All of these disciplines provide insight about engagement related to informal education websites.
Chapter 3: A Three-Part Methodology
The study’s methodology is divided into three parts. In the first part, I describe my approach to the rhetorical analysis of the two informal education websites being studied. In the second part, I describe the design, development, and administration of a survey instrument and then analyze the results from a selected audience to determine the ways in which people respond to the key website elements. In the third part, I present my approach to interviews that asked respondents to explain their response to the websites.

Chapter 4: Analysis of Informal Education Website Engagement Elements
To build critical understanding of the engagement elements on each website, in Chapter 4 I analyze the multimedia and interactive elements of two websites about clean coal technology. The analysis is based on the theory that I discuss in Chapter 2. Comparing the two websites against a common theoretical perspective helps me identify the engaging elements used on informal education websites.

Chapter 5: Study Results
In Chapter 5 I present data collected by surveying and interviewing members of a test audience. The survey specifically targets the engaging elements present in the website that are identified in Chapter 4. To get detailed information about the response of individual participants, in Chapter 5 I also present data collected by personal interviews.

Chapter 6: Discussion, Implications, and Continued Research
In Chapter 6 I synthesize the information presented in Chapters 4 and 5 and draw conclusions. I also note questions for further research and discuss implications of my research.
CHAPTER 2: ENGAGING NON-SPECIALIZED AUDIENCES ON INFORMAL EDUCATION WEBSITES

When it comes to energy, American society suffers from a conflict of values. One value supports conservationist good will. Another value supports energy consumption—dependency on energy to fuel automobiles, computers, air conditioners, and televisions. The two values—conservationist good will and an appetite for energy—are not easily reconciled and are played out in the controversy about clean coal technology.

One way to reconcile environmental and energy needs is research and development of alternative energy sources like clean coal technology. These scientific research programs cannot succeed without the support and compliance of the general population. Why? Since the scientific community and the public will need each other to manage the energy problem, successful communication between the two groups is vital. However, bridging the communication gap between the scientific community and the general public is difficult in two ways. First, success requires managing different conventions and knowledge specializations. Second, success depends on the particulars of style, content, form, and so on of the communication artifact itself. A common way to achieve this type of communication is through informal education.

Informal education is any program designed to familiarize the general public with scientific and technical arguments. While informal education produces many types of artifacts, this study is especially concerned with websites. Understanding informal education websites—boundary objects that help manage the relationship between the scientific community and the general public—requires a strong critical foundation both in the differences between the scientific community and the general public and in the particulars of online communication. Building that critical foundation is the first step towards answering my research questions about website elements that affect the public’s engagement in addressing major technological problems such as energy need and the public respond to those elements.

Fortunately, building the critical foundation necessary to answer these two questions does not require starting from scratch. Established communication theory includes insights both about the boundaries between discursive communities and about the particular design decisions of online communication. Many disciplines have relevant insight. For this study, I approach the informal education of science with theory from rhetoric, sociology, and philosophy of science. For the practical task of managing communication on websites, I turn
to technical communication, new media theory, user-centered design, and human-computer interaction.

**Two Discourse Communities: Science and the Public**

The first step to understanding informal education websites is to understand the ways in which scientific knowledge operates differently in different communities. In *The Structure of Scientific Revolutions*, Thomas Kuhn (1964) explained how a scientific community can be split into groups. Adherents to different theoretical paradigms experience an incommensurability of ideas that prevents them from working together. The ideas expressed in one paradigm fly past people in another, unregistered and/or unrecognized. As further theorized by Randy Allen Harris in *The Rhetoric of Incommensurability* (2005), Kuhn’s work can imply a pragmatic challenge to communication between discourse communities.

If we consider the general public’s understanding of scientific issues as yet another paradigm, Kuhn’s ideas of incommensurability apply, but they don’t fully explain the public attitudes and behavior. While incommensurability explains some of the difficulties between the scientific community and the general public, it does not lead to a way of managing those difficulties. Either people agree and subject themselves to the paradigm, or they disagree and eventually remove themselves from the discussion. This approach (that is, addressing disagreement by dismissing an older, less popular view) must be avoided in the energy debate, and any debate that requires heavy public involvement because the public rarely displays the ability to think beyond long held positions that the scientific disciplines display. A reasonable reading of Kuhn that promotes scientific isolationism in which collaboration across paradigms is not likely, perhaps not even possible, can have serious consequences for scientific research. Kuhn’s concept of incommensurability may, in fact, reduce or prevent cross-disciplinary and interdisciplinary solutions to complex technological problems. Complex international issues, which include energy issues, cannot be resolved with partial solutions using narrowly focused scientific perspectives.

If incommensurability were the last word on the issue, large-scale collaboration between discourse groups would be unlikely, or impossible. Fortunately, scientific paradigms don’t always have to work on the absolute, “brick wall” incommensurability that prevents meaningful communication. An alternative explanation for the operation of scientific arguments comes from actor network theory, especially as applied by Bruno Latour in *Laboratory Life* (1979) and *We Have Never Been Modern* (1993). Rather than treating science as a binary belief or disbelief, Latour suggests that science is a process of reinforcing a paradigm across larger networks of people and in more circumstances. The bit of scientific
knowledge is somewhat different, depending on which people and which circumstances are inspected. Simply put, actor network theory argues that circumstances (including people, ideas, objects, and technologies) are interdependent. As objects in the network are independently understood by various actors, the consequence is that the object is necessarily perceived as “different.” For example, under some circumstances, a website could be informative and in others, entertaining. Still other circumstances might make the website persuasive, and in others annoying.

Looking at scientific knowledge as a network of circumstances (including people, ideas, objects, and technologies) makes easier our understanding of the ways in which that knowledge changes based on the circumstances in which it resides. However, for Latour’s brand of actor network theory to be workable, it must also explain observations of incommensurability. Actor network theory can explain the incommensurability as a lack of successful boundary objects.

**Boundary Objects and Informal Education Websites**

Even when science occurs across a network of circumstances, a kind of incommensurability still exists between different parts of that network. The best analog for incommensurability in actor network theory is the boundary. Boundaries are interesting because they outline the edges of discursive communities and identify places or situations where conflict and misunderstanding are more likely to occur. For example, as Susan Leigh Star and James R. Griesemer (1989) established in their ethnography of museum biologists, research is a joint effort of scientists, volunteers, administrators, beneficiaries, and the public. Even though each group had unique interests, knowledge, duties, and abilities, all were able to operate as a single network. Star and Griesemer found that the scientific process was handled through managerial decisions and through boundary objects—those objects that “inhabit several intersecting social worlds and satisfy the informational requirements of each” (1989, p. 393).

Informal education websites like the Department of Energy’s Coal Energy Portal and Learnaboutcoal.org fit this definition. The information common to both websites—the decreases in greenhouse gas emissions of clean coal power, the correlated increase in efficiency, and the abundance of coal fuel—is relatively stable knowledge for the broad community of scientists (Schryer, 1993). However, the same information is not nearly so stable for the broad community that comprises the general public. Informal education websites, therefore, are widely accepted references in one community and teaching tools in the other or, as suggested earlier, informative and entertaining.
The general public’s limited awareness about coal power may not seem particularly threatening. All sorts of science marches on with no significant public oversight. Why should the scientific community care to engage the public in any sort of discussion? In the long run, science and technology are only useful to the extent that society employs them. Even though the members of the general public are somewhat removed from energy research, failing to engage them, or engaging them unsuccessfully, carries serious consequences for both the researchers and the public. A similar situation is identified by Maria Eichmans Cochran. In her case study of communication failures between Brookhaven National Laboratory and its surrounding community, she discusses how a relatively minor accident led to public controversy and eventually to the termination of many nuclear experiments (Cochran, 2004; 2007). Cochran argues that if Brookhaven National Lab had fostered a better relationship with the surrounding community over the 50 years prior to the accident and if they had been more attentive to the communication patterns of the general public, they may not have lost their experiments. This is just one example of how failing to engage the public can have serious negative consequences.

The need to engage the public is not lost on the coal industry. The general public is a clear stakeholder in the outcome of coal energy research. The public holds some political control over research through the democratic process and some financial control over the industry through consumption choices. The general public can also voice opinions in public forums online and in print. Therefore, the question is not if the public will engage with the research, but how. This increased engagement results in stronger public decision-making, specifically about energy. However, such engagement cannot happen without successful boundary objects, including informal education websites. To gain specific insight into the ways in which the public engages and is engaged by informal education websites, I now turn to the particulars of online communication practices. Constructing a foundation of theory from technical communication, human computer interaction, and new media studies supplies a baseline for discussing the informal education websites that engage the public in clean coal energy research.

Elements of Online Communication

Online communication is complex and difficult to analyze. To simplify the process, websites can be separated into constituent elements that perform necessary tasks—information, persuasion, and engagement. These tasks were founded in classical rhetorical theory. For example, engagement, which is of special importance to this study, can be traced to Cicero’s
concept of *delectare*—the presentation should augment the appeal and interest of the content (Cicero, trans. 1959).

Technical communication textbooks and handbooks of user interface design (e.g., Burnett 2005; Shneiderman & Plaisant 2005) contain advice about the selection and implementation of website elements. Whether consciously, unconsciously, or accidentally employed, each element manifests a design decision that has interrelated observable, numerous, and overlapping effects on users that can be observed empirically through user testing. For convenience, I sort these elements into three useful categories:

- Elements that support the informing process
- Elements that support the persuading process
- Elements that support the engaging process

At a minimum, information elements include accessibility, usability, and understandability (Burnett, 2005; Schriver, 1997). Persuasion elements include credibility moves and rhetorical appeals (Aristotle, trans. 1924). Engagement elements include at least multimedia and interactive elements. Many of these elements appear in Table 2.1. Though

<table>
<thead>
<tr>
<th>Informational elements</th>
<th>Persuasive elements</th>
<th>Engaging elements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accessibility</strong></td>
<td><strong>Credibility</strong></td>
<td><strong>Multimedia</strong></td>
</tr>
<tr>
<td>Navigational Cues*</td>
<td>Design/Style*†</td>
<td>Typography</td>
</tr>
<tr>
<td>Architecture*</td>
<td>Sources*</td>
<td>Imagery†*</td>
</tr>
<tr>
<td></td>
<td>Ethos*</td>
<td>Sound†</td>
</tr>
<tr>
<td></td>
<td>Academic Rigor°</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Current**</td>
<td></td>
</tr>
<tr>
<td><strong>Usability</strong></td>
<td><strong>Appeals</strong></td>
<td><strong>Interactivity</strong></td>
</tr>
<tr>
<td>Identifier*</td>
<td>Logos*</td>
<td>User-generated content</td>
</tr>
<tr>
<td>Transitions*</td>
<td>Pathos”</td>
<td>Functionality</td>
</tr>
<tr>
<td>Design*</td>
<td>Ethos”</td>
<td>Hypermediacy‡</td>
</tr>
<tr>
<td>Simplicity†</td>
<td>Values”</td>
<td>Human Personality*</td>
</tr>
<tr>
<td>Immediacy†</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Understandability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Register†</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Content*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual Aids*†</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sequence†</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


1“Engagement” can have many meanings. A full catalogue of the terms meanings would be useful, but for the purpose of this study I limit discussion only to user’s interest and willingness to spend time with material.
the list is necessarily partial and imprecise, the diversity of website elements forms a matrix of potentially testable factors.

Actively testing every possible website element might be possible but would be prohibitively time consuming and expensive. To reduce the effort required and to maintain the usefulness of the study, researchers must focus on website elements that are particularly prominent or influential. In this study, both artifacts—the U.S. Department of Energy’s Coal Energy Portal and the Americans for Balanced Energy Choices’s Learnaboutcoal.org—display similar solutions to the informing and persuading processes. However, even a brief glance shows that the two artifacts have vastly different approaches to engaging the audience.

**Focusing On Engagement**

Since informal education websites are boundary objects between discourse communities, I suggest that engaging the audience is critical. The nature and level of engagement on informal education websites can be seen on the two artifacts I am testing: Learnaboutcoal.org and the Coal Energy Portal. These sites take very different approaches to engagement, especially with regard to multimedia and interactive elements. The content on both sites is almost identical and the arguments are similar. The way claims and evidence are presented, though, is very different. Learnaboutcoal.org is slick and makes use of the technologically advanced elements. In contrast, the coal energy portal is stark, providing information in an unadorned way.

While “engagement” includes participation, interest, involvement, or any of a dozen related concepts, for the purpose of my analysis, I focus on two aspects of engagement that, given the versatility of the internet, are uniquely important to informal education websites. They are multimedia and interactivity.

**Multimedia Design Elements**

Multimedia refers to the use of more than one mode of communication—especially, presentations that use not only textual information but also graphic and auditory information. Since non-textual elements can be present in varying amounts on a website, multimedia sites are scaleable—that is, they are entirely variable in textual, graphic, and auditory elements. For example, an essay that uses boldface headers displays a small amount of multimedia, if any. Another essay that uses decorative and informative images display _more_ multimedia. Adding motion, sound, animations, and video clips displays even more multimedia. Website users subjectively compare the amount and quality of multimedia on websites.
To improve the accuracy and precision of the analysis and test of users’ responses to multimedia elements, I inspect four areas of multimedia that scholarship in technical communication, user centered design, human computer interaction, and new media theory tend to suggest are especially important:

- Typography
- Imagery
- Motion
- Sound

These four types of multimedia are prominent elements that might differentiate two websites with remarkably similar content like Learnaboutcoal.org and the Coal Energy Portal. The use of multimedia might have special influence over users’ response. Since typography is arguably the most basic element influencing multimedia, this is where I begin my discussion.

**Typography**
Reducing the concept of multimedia into its most basic form might include only typographic design. Typographical cues can support textual relationships visually. However, typography on the Internet is relatively restricted. The web was originally designed for accessibility, not usability. As such, HTML is only a slight step up from plain text. Web designers choose from a limited number of typefaces and styles. They define titles, headings, subheadings, and body text, and they have limited control over the ways in which such elements are rendered on the screen. However, HTML depends a great deal on the users’ computers to determine how a typeface looks.

Typography experts like James Felici (2003) discuss the web with exasperation. Even with cascading style sheets and embedded fonts, a 72-dot-per-inch screen limits typographic sophistication (2003, p. 285-290). Still, setting type on the web follows the same general maxims as print typography. Applying visual design concepts like grid layout (Schriver, 1997) and chunking can indicate document structure, establish relationships between text, and image fields, and manage user attention (Kostelnick & Roberts, 1998).

**Images**
A more prominent use of multimedia is imagery. The purposes that images serve include information and decoration. Informative images, which supplement the content of a site, supply evidence, organize ideas, and compress arguments into quickly processed units. Images, which can also be decorative, contribute to the visual identity of a website and can increase visual interest may not add substantively to the content of the website.
Whether the images of a website are informative or decorative, they must be well adapted to the audience (Burnett, 2005). If users interpret an image differently than the site designers intend, the consequences might be severe. Confusion is an obvious consequence. A more serious consequence would be misinterpretation. Users might even reject the website entirely and leave.

Images have more than binary purposes to inform and decorate an argument. New media theorists tend to argue that they help create a virtual world in which users immerse themselves (e.g., Manovich, 2001; Bolter & Grusin, 2000), increasing their engagement with the site.

Motion
While images represent a higher degree of multimediacy than typographical cues, motion represents a higher degree than images. A variety of kinds of motion appear on websites. Video clips and animations are obvious examples that are becoming common as more users access the web with broadband connections. However, other types of motion are important as well. Pop-up ads, drop-down boxes, and scrollable text are a few examples of motion prevalent on websites.


Do users really want an illusion created by informal education websites? Are informal education websites related to the entertainment genres discussed by Manovich (2001) and Bolter and Grusin (2000)? I think a great chance exists that informal education websites will continue to follow the practices of information systems that I discuss from human computer interaction (HCI) and in user-centered design. Both in HCI and user-centered design, system designers maintain a respect for users. Users have specific tasks in mind before they even start using a system (Norman, 1986; Shneiderman & Plaisant, 2005). Users may appreciate entertainment, but given the nature of informal education websites, they are more likely interested in information.
**Sound**

The use of sound is tied very closely to the use of motion on websites. The conceptual conflict between new media theory and user-centered design about motion spills into sound as well. Bolter and Grusin (2000) might say that adding sound increases the immediacy of the virtual world. Manovich (2001) might say that it improves the illusion, making a better (or, at least, more engaging) experience for users. In the world of entertainment, this is typically true because a richer medium often means a more popular product. Just as films shot in black and white are retro and artistic, while full-color films are mainstream, silent movies are less popular than those with sound.

However, common sense and a great deal of informal evidence suggest that sound is not always beneficial. Most of us have a common, negative experience with unsolicited sound on websites, especially when we are not able to control it. People tolerate sound on some websites, and not on others. What remains to be seen is whether users prefer sound or silence on informal education websites. Sound may be another case where technological capability outpaces human interests; higher technology does not always imply better communication.²

**Interactivity**

A second type of engagement element is interactivity. The word *interactivity* is used in many different and incompatible ways. To limit the discussion to interactivity that is distinct and influential, I offer that a website element is interactive if it allows users to share agency with the information system or the system’s designers. This definition permits a scale of interactivity. A navigation menu is certainly be interactive, since user action would change the displayed content. An animated menu with rollover buttons is more interactive. A game, online calculator, or a weblog is even more interactive. *Interactivity* is arguably more important than multimedia for energy issues because it allow users to participate in the production of knowledge and in decision-making. Interactivity implies a shared agency between the users, system designers, and the system itself.³

As with multimedia, interactivity is measurable in amount and quality. For example, two online games might both be interactive, but one might be more engaging for some users than the other. Hence, an interactive website component has two attributes that together account for users’ experience—the degree of interactivity and the perceived quality

---

² Plenty of anecdotal evidence exists that sound is bad on websites, especially unsolicited sound. However, little scholarship treats it specifically.

³ *Interactivity* is a slippery term. After all, a written paper is interactive in the sense that it is intertextual. But the ideas of shared agency and participation help to narrow the possible interpretations of interactivity.
of interactivity. To improve the accuracy and precision of my analysis and testing of users’ responses to multimedia elements, I inspect four areas of interactivity that seem particularly important:

- User-generated content
- Functionality
- Hypermediacy
- Human personality

These four prominent types of interactivity might differentiate two websites with remarkably similar content like Learnaboutcoal.org and the Coal Energy Portal, and might have special influence over users’ responses.

USER-GENERATED CONTENT
The first form of interactivity that is interesting to this study is user-generated content. Allowing users to add and adjust a website’s content is a unique feature of technologically mediated communication. The Internet is particularly capable of giving a voice to the public. Some of the most important—or at least more popular—online communities are those that are entirely produced by users. Websites that rely on the community to produce content multiply the breadth and depth of knowledge that can serve as a foundation (Morville, 2005, p. 135). As these communities continue to develop more advanced means of ensuring credibility, their authority and usefulness grows.

While engaging the audience is easily done on the Internet, the concept of user-generated content has been a critical part of ideology and practice in a number of arenas at least since the mid-20th century, such as Rogerian argument and linguistics. For example, Rogerian argument is founded on recognizing the position of the audience (Hairston, 1976). User-generated content is also an analog to part of what linguists call “involvement strategy” (Tannen, 1989). User-generated content tends to increase engagement—the interaction between users, information systems, and information system designers. The importance of involving the public in political discussions is not difficult to establish, especially in public debates like energy that are particularly sensitive as I noted earlier when I cited the situation at Brookhaven National Lab described by Cochran (2004).

FUNCTIONALITY
The second form of interactivity that is important for websites is functionality, which is a difficult concept to define. Some websites allow users to actually perform tasks on the web. For example, online calculators, car insurance quote generators, web-based email, and other
web applications all allow users to complete some task. All sorts of functionality grant power to the users, who are freed to use such tools in whatever ways they see fit.

The scholarship specifically about functionality is sparse in the fields I am synthesizing. However, functionality can be looked at from the lens of user-centered design. When users visit a website, they tend to have a specific goal in mind (Shneiderman & Plaisant, 2005): fact-finding, entertainment-seeking, or any number of other actions. Identifying the tasks users want to perform is a key part of user-centered design and human computer interaction (Shneiderman & Plaisant, 2005; Norman, 1986). Failing to allow users to perform their desired tasks easily and quickly can result in those users choosing to use a different website.

HYPERMEDIACY
A third type of interactivity that is important for websites is hypermediacy. In Remediation: Understanding New Media, Bolter and Grusin (2000) argue that hypermediacy is an important feature of technologically mediated communication. Websites give power to users by collecting information from different sources and giving users access to those sources. Users’ experiences becomes nonlinear and partially self-determined. The availability of information recasts users’ identities. Whereas before users were subject to the experience presented them, hypermediacy gives them more control over that experience.

However, extreme hypermediacy can quickly overwhelm users, resulting in information overload—a concept proposed by Calvin Mooer in 1959 and applied to web communication by Peter Morville (2005, p. 165). While most people are capable of handling multiple lines of argument at a time, a certain limit exists beyond which users are too confused to make the best use of the communication artifact. Take, for example, users with a specific fact-finding goal. If a website does not connect enough information, users are unlikely to be satisfied. At the same time, if the site connects too much information, users are likely to get lost or distracted. Either represents a failure condition.

Hypermadiacy is a key attribute of technologically mediated communication. Like the other elements I discuss, hypermadiacy is a scalable quantity. Too little and users’ experience lacks the power of technology. Too much and users can suffer from confusion and distraction. Hypermadiacy must, therefore, be balanced to accommodate users’ needs efficiently (considering navigability, hierarchy, design, and so on; see Table 2.1).

HUMAN PERSONALITY
A fourth type of interactivity that I examine in this study is the use of human personality. Websites can either suppress the speaker or actively construct a personality for the speaker.
Including a personality provides users with a counterpart to simulate conversation. If including a personality humanizes a website or makes it more approachable, users might respond to that website more favorably.

As a rhetorical technique, the use of personality goes back to the ethos appeal from Aristotle (trans. 1924; trans. 1985). However, Kenneth Burke’s concept of rhetorical agent from dramatist critique provides more precise explanation (1969). Dramatism is particularly useful because of its ability to gauge the relative prominence of different aspects of rhetorical presentation. Dramatism provides a way to consider roles or performances—both of agents on websites and of users of the websites.

Extending Burke provides a way to describe human personality as played out in roles for both the agents on the site and the users. Agents on websites can perform largely informative roles or largely entertaining roles. Users can perform engaged learner roles or more passive spectator roles. These roles of are not simple binaries, though that is the easiest way to present them. In fact, the roles of website agents and users often include elements of being both information providers and entertainers, of being both learners and spectators.

Informal education websites can encourage any combination of these roles. As I discussed previously, theorists and practitioners must balance the entertainment capabilities of technologically mediated communication and with the informational capabilities. New media theorists (e.g., Bolter and Grusin, 2000; Manovich, 2001) tend to focus more on entertainment. Technical communicators (e.g., Burnett 2005; Schriver, 1997), human-computer interaction theorists (e.g., Shneiderman & Plaisant; 2005), and user-centered designers (e.g., Norman, 1986) seem to focus more on information. Close attention to the rhetorical situation and the demands of the audience is required to sort out these roles with respect to the two websites analyzed in this study.

**Multiple Disciplines Converge on Engagement**

New media theorists like Manovich and Bolter, and Grusin seem to view new media as primarily for entertainment. They also seem to agree that artificial intelligence is a goal in and of itself. Convincing users to accept the anthropomorphism of computer systems is the ultimate goal of this brand of new media.

Technical communication, user-centered design, and human-computer interaction theorists like Burnett, Schryer, Shneiderman and Plaisant, and Norman take a different view of communication. For them, artificial intelligence is not currently convincing enough to suspend disbelief and persuade users that they are interacting with a human. They suggest that attempting to persuade users they are interacting with a human can only result in broken
promises. Extending this pragmatic approach to websites argues for using as little human personality as possible.

Having a strong background specifically targeted towards engagement strategies as discussed by theorists in rhetoric, technical communication, new media studies, and human-computer interaction goes a long way in preparing for a close critical analysis of the two websites being tested. In Chapter 4, I analyze two informal education websites with special attention to their engaging elements. That analysis would not be possible without diverse and robust communication theory about technologically mediated communication, human computer interaction, new media, and visual design. The theory gathered here helps support the upcoming analysis.
CHAPTER 3: A THREE-PART METHODOLOGY

Informal education websites are a particularly complicated form of communication. They are heterogeneous combinations of many discrete elements that interact and recombine to build knowledge. If the combination of elements is successful, it results in a website that informs, persuades, and engages its audience. Since this study is especially concerned with the ways in which websites engage their audiences, I focus on website elements that are likely to contribute to the engaging task. Doing so addresses my primary research questions:

- What website elements affect the public’s engagement in addressing major technological problems such as energy need?
- How does the public respond to those elements?

These research questions can be addressed with critical analysis and quantitative and qualitative data. I have chosen to use a mixed methodology approach because each of the three succeeding categories of data cuts closer to individual users’ experiences. First, I compare the two websites being tested to the ways that communication theory predicts users may respond. Second, I develop and use a quantitative survey instrument to identify the ways in which users respond to the website. Finally, I interview representative users to identify specific reasons why those users responded as they did.

In this chapter, I discuss both the circumstances and the design of my study. To explain the circumstances of the study, I describe the specific website elements being tested, the artifacts chosen for analysis, and the target user population. To explain the design of the study, I describe the method of analysis, the survey instrument, and the interview process.

Circumstances of the Study

A number of constraints shaped this study from the beginning. The complexity of communication on websites, the resources available for the investigation, and the availability of artifacts and study participants guided the study’s progress. To manage these challenges, in this study I focus on only a few elements in closely related artifacts to test, and select willing participants who are representative of the target population.

Website Elements to Study: Engagement

Websites are comprised of many multimedia and interactive elements that can be combined in different ways to increase user engagement. Since one of my goals in this study is to

---

4 Users who respond similarly are then considered a response group. While this study didn’t have enough of a population base to identify these kinds of groups, it is likely to occur and deserves a more robust study.
examine the ways in which different element combinations lead to different user responses, I chose website elements that are likely to differentiate the two websites being tested. Some elements are so common that no appreciable differentiation exists. Other elements do not differentiate websites because they are too rare. Therefore, I chose to study elements that are prominent on the websites being tested and are distinct in the ways they are implemented. For the two websites being tested, I identify three factors to study that support users’ engagement—motion, sound, and human personality.

**Motion**
The first website element I test is motion. Motion, including animation, moving text and images, and video clips, is a prominent engaging element on some informal education websites. The use of motion can be considered either largely informative or largely entertaining, depending on what critical approach is used. Choosing which approach is most appropriate requires a detailed understanding of the rhetorical situation of the websites being tested.

The Coal Energy Portal uses motion very sparsely whereas Learnaboutcoal.org makes heavy use of motion. Given that disciplines and artifacts both take distinctive approaches to the use of motion, studying the ways in which motion is implemented in an actual situation is interesting.

**Sound**
A second website element that is often paired with motion is sound. While motion and sound do not necessarily coincide, the two elements are correlated on the websites being tested. As with motion, academic disciplines take different approaches to the use of sound, and those approaches play out on actual websites. A study of sound—through analysis, testing, and interviews—helps to determine whether emphasizing information or entertainment is more appropriate for the situation on the informal education websites being tested.

**Human Personality**
A third website element related to motion and sound is human personality. Motion and sound can combine with other elements to create an identity for websites. This identity can serve as a rhetorical agent or spokesperson and, thus, humanize the content and make it more approachable. It can also anthropomorphize the website itself.

The use of human personality on a website, like motion and sound, must balance information (e.g., Shneiderman & Plaisant, 2005) and entertainment (e.g., Manovich, 2001).
Constructing a human identity on a website might make that website more “user friendly” or more interactive. On the other hand, users might reject the artificial human relationship.

The two websites being tested take different approaches to the use of human personality. The Coal Energy Portal suppresses the rhetorical agent, following the conventions of scientific writing, while Learnaboutcoal.org includes heavy use of personality. Studying human personality on these websites helps determine which approach is more appropriate for the rhetorical situation on the informal education websites being tested.

**Artifacts for Testing**

This study tests users’ responses to two artifacts—Learnaboutcoal.org and the Coal Energy Portal—about current research in coal energy technology (see Figure 3.1). The two websites are rhetorically interesting for several reasons. They have very similar content. Looking at the data and evidence supplied by each, the two share content almost line by line, and most of their external citations are nearly identical.

While the two websites are very similar in content, they take very different approaches to presenting that content, especially regarding motion, sound, and human personality. Each site makes different assumptions about users’ goals and activities. For example, the Coal Energy Portal presents itself as a catalog of information that can be mined like an encyclopedia. On the other hand, Learnaboutcoal.org presents a narrative and invites users to enter a virtual world.
The similarity of content of these two sites enables my analysis to focus on the presentation, especially the engaging elements of motion, sound, and human personality.

**Research Participants**
To compare the presentation of information on the two website, I recruited 20 university honors students—10 per website—for user testing. University honors students were recruited for two reasons. The first reason is their availability and their willingness to participate in research.

The second and more important reason for recruiting university honors students is that they are representative of the socially engaged individuals that the websites target. I argue that the two websites being tested primarily target the minority of the general public who actively take part in the political process and who are more likely to enter the national discussion about energy and energy policy. Since honors students tend to engage in political issues, they can serve as an approximation of the concerned citizenry.

**Study Design**
To understand how motion, sound, and human personality operate as engaging elements of informal education websites, I designed this study to get progressively closer to individual users. The study has three parts—a critical analysis based on communication theory, a survey instrument to determine how groups of users respond to the websites being tested, and an interview process to typify users’ experiences in response groups.

**Critical Analysis**
The first part of the study is a critical analysis based on the communication theory presented in Chapter 2. The theory draws on technical communication, new media studies, user-centered design, and human-computer interaction to explore the ways motion, sound, and human personality are used on the website and the ways users respond to it. This analysis, presented in Chapter 4, identifies which elements are more prominent and influential for the actual artifacts being studied. I identify expected users’ responses by comparing the ways in which the elements are actually used on the site to communication theory from technical communication, user centered design, human computer interaction, and new media studies.
Survey Design
The second part of the study is a survey instrument. The survey is intended to identify the ways in which users respond to motion, sound, and human personality on the two websites being tested. The survey includes four parts:

1. demographics and original position
2. website browsing
3. response to motion, sound, and human personality
4. new-position questions

Each survey part is designed to reveal a particular characteristic of users’ responses to one of the two websites being tested.

Demographics and Original Position
The first part of the survey asks demographic and original-position questions. Demographic questions help identify whether users with similar backgrounds respond similarly to the websites being tested. If users with similar background respond in a similar ways, they can be considered a user response group. Therefore, demographics might serve as an independent variable in the study.

Original-position questions are important because they establish a standard for comparison. These responses allow me to focus on specific users’ responses to the websites. The demographic and original-position questions are presented in Appendix A, along with the rest of the survey questions and instructions.

Website Browsing
The second part of the survey allows users to browse one of the websites. After answering demographic and original-position questions, study participants are directed to use one of two websites about research in clean coal technology. While this interaction is not timed, users are directed to spend roughly 10 minutes with the site.

In order to be sure that users are exposed to similar content, they are instructed to focus on the splash screen and one subordinate web page (see Figure 3.2 next page). The subordinate web pages were chosen for the similarity of content. The pages chosen for analysis can be found in Appendix B. Using pages parallel in content increases the likelihood that differences in users’ responses are due to the different motion, sound, and human personality elements on the two websites.
Response to Motion, Sound, and Human Personality

The third part of the survey collects users’ perceptions about the motion, sound, and human personality elements on the two websites. Since the participants are students at a technological university, I assumed that they have a good understanding of typical website conventions against which to compare the websites being tested. Therefore, the survey uses direct questions, allowing study participants to gauge the websites against their own expectations (see Table 3.1).

Table 3.1 Test Variables for Motion, Sound, and Personality

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Dependant Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of Element</td>
<td>Affect on User Interest</td>
</tr>
<tr>
<td>Quality of Element</td>
<td>Affect on User Willingness to Spend Time</td>
</tr>
</tbody>
</table>

Perception of Amount

Participants were asked to identify the amount of motion, sound, and human personality on the website they viewed. They were presumed to have enough experience with the Internet to compare the websites being tested.

Perception of Quality

Participants were asked to subjectively report the level of quality of motion, sound, and human personality on the website they browsed. The term “quality” can be defined in many relevant ways. Rather than specifying how to gauge quality, this study allowed individuals to apply their own judgment regarding quality. Participants were directed to consider both...
content and production quality, but otherwise are left to define high and low quality on their own.

**Response of User Interest**

For motion, sound, and human personality on the website, participants were asked to gauge how both the amount and quality, however they chose to define it, of each element affected their personal interest in the website.

**Response of User Willingness to Spend Time**

For motion, sound, and human personality on the website, participants were asked to gauge how both the amount and quality, however they chose to define them, of each element affected their willingness to spend time on the site.

**New Position Questions**

The last part of the survey collected data about users’ new positions. The questions in this part of the survey mirrored the original position questions from the first section. Asking participants to answer these questions again allows me to identify changes in the users’ general opinions. Since the website was the only stimulus related to energy issues that users experienced in the interim, any shift in their opinions can probably be attributed to the website they used.

**Interview Design**

The third part of the study was an interview process designed to inspect the responses of three study participants in more detail. The finer detail helps identify why users responded as they did to engagement elements on websites. This section describes how interview subjects were selected and how interviews were conducted.

During the survey process, users were asked to volunteer to discuss their responses in person. Three volunteers were chosen: two who browsed Learnaboutcoal.org and one who browsed The Coal Energy Portal. A fourth interview participant who reviewed the Coal Energy Portal site volunteered to be interviewed but failed to follow through, even when reminded with phone and email messages.

To ensure that the users would accurately discuss their responses, the interviews were conducted confidentially. Each interview lasted between 20 and 30 minutes and was recorded on video and audio tape. The interview questions and responses were subsequently transcribed.

The interview process was designed to allow study participants to define as much of the discussion as possible. In order to let the study participants discuss their own responses,
interviews were open-ended. The interviewer began each part of the interview with an open-ended question about the participant’s survey responses. Then, looking both at the survey responses and at the website that the participant viewed, the interviewer and the study participant discussed the prominent website elements and the user’s unique responses. This allowed the study participant the most freedom possible in determining the course of the interview discussion. Transcription of interview questions and answers are available in Appendix C.

A Three Part Study of Engagement Elements

This study uses a three-part methodology to arrive at the closest possible understanding of users’ experiences. First, I use a critical analysis to identify the most prominent engagement elements on each of the websites being tested. Second, I use a survey instrument distributed to 20 university honors students in two groups—one for Learnaboutcoal.org and one for the Coal Energy Portal—to make broad observations about how groups of users respond to each website. Finally, I use an interview process to characterize the individual user experiences of three study participants. The next two chapters of this study present the results of these research methods. Chapter 4 analyzes the engagement element on each website. Chapter 5 presents the results from the survey and interview processes.
CHAPTER 4: ANALYSIS OF INFORMAL EDUCATION WEBSITE ENGAGEMENT ELEMENTS

Informal education websites are more likely to be successful if they perform three communication tasks—informing, persuading, and engaging the audience. First, websites must inform users in an understandable way. Second, websites must persuade their audiences, adjusting the audiences’ attitudes so people are receptive to the research described by the website. The third task—engaging the users—is the focus of my study.

In this chapter, I analyze two informal education websites that have similar purposes. Namely, they argue that leading-edge research into clean coal technology is a productive and worthwhile investment for the country, for corporations, for citizens—that is, for all the stakeholders. While similar in purpose, these websites take different approaches to using engaging elements. Comparing the use of engaging elements on these two websites is the first step to answering my research questions:

- What website elements affect the public’s engagement in addressing major technological problems such as energy need?
- How does the public respond to those elements?

After a detailed critical analysis, describe a study that asks useful questions about the ways in which users actually respond to the engaging elements on the two websites.

Preliminary Analysis

Many categories of website elements influence user experiences (see Appendix D). While this study focuses on engaging elements, a narrower focus is still required. However, I do not suggest that the elements I analyze are the only ones that are distinct on the two websites. My preliminary analysis recognizes that the two websites use many notably different elements. Each site frames the discussion of clean coal technology in a different way. The typography, imagery, motion, and sound of each website contribute to a unique user experience. However, these are not the only elements that contribute to users’ experiences, and so a broader look at the gross differences between the two websites is useful. A preliminary inspection identifies many differences of varying subtlety (see Table 4.1 next page).

While all of these differences are important, this study sets many of them aside to focus on specifically engaging website elements. My preliminary analysis reveals that two categories of engaging elements are particularly important to test—multimedia and interactive elements. These categories are especially interesting because they are unique to online communication. Furthermore, the websites being tested seem to display starker
differences in their application of multimedia and interactive elements. Since the websites display such different approaches to multimedia and interactive elements, analyze four elements in each category (see Table 4.2; refer to Chapter 2 for a full discussion of these elements).

**Table 4.1 Preliminary Analysis of Two Websites**

<table>
<thead>
<tr>
<th>The Coal Energy Portal</th>
<th>Learnaboutcoal.org</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impersonal</td>
<td>Personal</td>
</tr>
<tr>
<td>The site never invokes the users or the audience of the website. The site doesn’t have a spokesperson/rhetorical agent.</td>
<td>The site approaches its audience in an accommodating, personal way.</td>
</tr>
<tr>
<td>Technical</td>
<td>Less technical</td>
</tr>
<tr>
<td>The vocabulary is specialized and references particular research projects.</td>
<td>While it uses technical information, it presents it graphically and avoids technical terminology.</td>
</tr>
<tr>
<td>Extensive information</td>
<td>Limited information</td>
</tr>
<tr>
<td>Many research projects are presented as a vast network of interrelated scientific programs.</td>
<td>The site links to relatively few other research projects.</td>
</tr>
<tr>
<td>Multiple authorial voices</td>
<td>Few authorial voices</td>
</tr>
<tr>
<td>Each page on the site, and even separate text on single pages, seems to be written independently and not designed as a linear, coherent argument.</td>
<td>The site constructs a single, almost linear argument. While it has several speakers, there is no appreciable difference in how those speakers approach the audience.</td>
</tr>
<tr>
<td>Minimal bias</td>
<td>Blatant bias</td>
</tr>
<tr>
<td>The website suppresses cultural bias. The only overt evidence of cultural bias comes from administrative research directives.</td>
<td>The website does not suppress cultural influence the same way the Department of Energy site does.</td>
</tr>
</tbody>
</table>

**Table 4.2 Engagement Elements Being Tested**

<table>
<thead>
<tr>
<th>Multimedia elements</th>
<th>Interactive elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typography</td>
<td>Functionality</td>
</tr>
<tr>
<td>Images</td>
<td>Hypermediacy</td>
</tr>
<tr>
<td>Motion</td>
<td>Human Personality</td>
</tr>
<tr>
<td>Sound</td>
<td>User-generated Content</td>
</tr>
</tbody>
</table>

**Engaging Elements on Two Websites**

The websites being tested both display a distinctive combination of the engaging elements listed in Table 4.2. A comparative analysis of the interactive and multimedia elements of each website characterizes the websites and identifies which elements are likely to produce an observable effect in users’ responses. While this analysis is comparative, each website (see
Table 4.3) will be dealt with individually, beginning with the Department of Energy’s Coal Energy Portal.

Table 4.3 Two websites that take different approaches to presenting the same content

<table>
<thead>
<tr>
<th>Publishing entity</th>
<th>Website title</th>
<th>Website URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Americans for Balanced Energy Sources</td>
<td>Learnaboutcoal.org</td>
<td><a href="http://www.Learnaboutcoal.org">http://www.Learnaboutcoal.org</a></td>
</tr>
</tbody>
</table>

Artifact 1: The Coal Energy Portal

The U.S. Department of Energy publishes websites about the research programs it supports. Since many of these programs are interrelated, the Department of Energy collects links to programs on topical portals. The Coal Energy Portal is a central location from which users can access the latest developments in coal gasification, carbon sequestration, and other advanced fossil fuel research. Like any effective website, the Coal Energy Portal is a distinctive combination of website elements that work to achieve the website’s purpose. The Coal Energy Portal takes a distinctly minimal approach to multimedia elements and interactive engaging elements (see Figure 4.1).

Figure 4.1 The Coal Energy Portal Front Page: The simple style of the Coal Energy Portal values accessibility of advanced technology.
Multimedia Elements on The Coal Energy Portal

The engaging elements on the Coal Energy Portal belie a direct style. The simple combination of formatted text and images challenges assumptions that advanced technologies like Flash™ animations and full-motion video are the only effective ways of engaging an audience. The front page for the Coal Energy Portal uses very sparse multimedia elements and instead prefers simple hypertext (see Figure 4.1). The result is a practical portal that allows for high accessibility but often does not take the opportunity to use visuals and sound to engage the audience. Examining the typography, images, motion, and sound on the Coal Energy Portal clarifies the ways in which the website engages its audience with multimedia.

**Typography**

The first design element I discuss is typography (see Table 4.1), which is critical on this website because it identifies text hierarchy and organizes hyperlinks. The Coal Energy Portal follows typographic conventions (Felici, 2004; Burnett, 2005). Like any professional document, the Coal Energy Portal uses typographic style to identify headers, titles, captions, and body text (see Figure 4.2.1). The portal also uses Web conventions to organize the hyperlinks that are set apart by color and underlining (see Figure 4.2.2), especially in body text. Hyperlinks in navigational menus rely on position and rollover affects to identify their function (see Figure 4.2.3). The clarity and simplicity of typography both for content and hyperlinks suggest that the Coal Energy Portal is using conventions appropriately for the purpose.

![Figure 4.2 Typography on the Coal Energy Portal: Typography indicates (1) body text, (2) hyperlinks, menu items, and (3) headings.](image-url)
IMAGES

The second design element is the use of images, which can decorate text to add visual interest or can contribute to knowledge-making. Either type can engage users. The Department of Energy makes sparse use of images on its Coal Energy Portal. Most of the images are decorative rather than informative (see Figure 4.3.1).

Subordinate web pages of the Coal Energy Portal do use some informative images. Charts, graphs, and diagrams are used rarely and are not placed prominently (Figure 4.3.2). More emphasis on informative images in prominent places—as seen in the Learnaboutcoal.org website—might evoke more user engagement.

MOTION

The third design element is motion, which is often seen as an enhancement of imagery, but as communication elements on the Internet become more modular (Manovich, 2001, p. 30), motion can be applied to any type of design element. Animated text and video can make communication more immersive (Bolter & Grusin, 2000, p. 200), but it is not heavily used on the Coal Energy portal. The only motion is in dropdown menus (see Figure 4.4).
The motion of the dropdown menus seems to do nothing more than hide extra links. In that regard, motion seems to exist primarily to support functionality, an interactive element. Otherwise, motion is completely absent, despite ample opportunity. For example, when the Coal Energy Portal quotes policy makers who talk about energy researchers, the site merely presents transcribed excerpts (see Figure 4.5), when it could easily include a video clip. Whether absent through a conscious choice to increase accessibility or by unintentional omission, the lower degree of motion distinguishes the Coal Energy Portal from Learnaboutcoal.org.

"We all believe technology offers great promise to significantly reduce [greenhouse gas] emissions -- especially carbon capture, storage and sequestration technologies."

President George W. Bush
June 11, 2001

Figure 4.5 Missing Motion on the Coal Energy Portal: Obvious opportunities to use video and sound, like this quote from President Bush, are not taken.

**Sound**

The fourth aspect of multimedia is sound. Like motion, sound can be useful for adding content and increasing the interest of a website, and can increase the immersiveness of the users’ experiences (Bolter & Grusin, 2000, p. 200). While more and more websites use multimedia technology to combine text, sound, and motion, The Coal Energy Portal does not employ any sound elements. This may be a good thing, given that users of this website may prefer an informative experience to an entertaining, immersive one. Employing sound on a website constitutes a major risk, since little critical theory addresses the conditions that govern users’ responses to sound. Users may not have the freedom to turn up the volume or may be annoyed by the intrusion on their privacy. Given that the Coal Energy Portal seems designed as an informational resource that responds to users’ requests, omitting sound seems to be a reasonable choice.

**Coal Energy Portal’s Multimedia Use**

Multimedia elements on the Department of Energy’s Coal Energy Portal are sparsely used, which may have consequences. The sparse use of multimedia frames the site as a source for reference rather than entertainment. The website depends largely on the content to add interest to the site and makes less use of the presentation. Finally, since engagement

---

5 While not explicitly used, many ideas from frame analysis as developed by Erving Goffman (1974) and later Deborah Tannen (1993), may apply. The theme appears in this study in a few places.
categories influence each other, the lower level of multimedia reduces the interactivity of the site.

**Interactivity on the Coal Energy Portal**

The characteristic simplicity of the Coal Energy Portal’s use of multimedia is also present in its use of interactive elements. Interactivity on a website can build a stronger relationship between the information system, its users, and its subject matter. To understand how the Coal Energy Portal uses interactivity, I analyze four types of engagement elements—user generated content, functionality, hypermediacy, and human personality. The Coal Energy Portal uses low levels of all of these, except for hypermediacy.

**User-Generated Content**

The first interactive element I analyze is user-generated content. Allowing users to have control over the communication process is one way to help them engage with science in a positive way (Cochran, 2004). Opening a dialog can demonstrate that the site designers have good will towards the audience (Aristotle, trans. 1985). However, the Coal Energy Portal provides almost no means for users to supply content. Just sending feedback to the website’s administrator is prohibitively effortful. The contact information (see Figure 4.6) is too hard

---

**Web Site Contacts**
for all DOE Web sites:

If you find a broken link or have questions/comments about DOE Web sites, please contact the appropriate Webmaster listed below:

Main website (http://www.energy.gov only) - DOE.Webmaster@hq.doe.gov

**Program Offices**
- Office of Civilian Radioactive Waste Management (http://www.orw.doe.gov/contact/index.shtml)
- Office of Electricity Delivery & Energy Reliability (http://www.oe.energy.gov/contacts.htm)
- Office of Environmental Management (http://www.em.doe.gov/Programs/ContactUs.aspx)
- Office of Legacy Management (http://www.legacy.doe.gov/contact.htm)
- Office of Nuclear Energy (http://www.nucleargov/)
- Office of Science (http://www.sc.doe.gov/Contact/index.htm)

**Staff & Support Offices**
- Office of the Chief Financial Officer (http://www CFO.doe.gov/)
- Office of the Chief Information Officer (http://cio.energy.gov/contact.htm)
- Office of Congressional Affairs (http://congressional.energy.gov/contact_us.htm)
- Office of Economic Impact & Diversity (http://diversity.doe.gov/Contacting_Us/contacting_us.html)
- Office of the General Counsel (http://www gc.doe.gov/)
- Office of Health, Safety and Security (http://www.hss.energy.gov/)
- Office of Hearings & Appeals (http://www oha.energy.gov/)
- Office of Human Capital Management (http://humancapital.doe.gov/contacts.htm)
- Office of the Inspector General (http://www.ig.energy.gov/contact.htm)
- Office of Management (http://management.energy.gov/)
- Office of Policy & International Affairs (http://www pi.energy.gov/)

Figure 4.6 User-generated content on the Coal Energy Portal: User-generated content is suppressed on the Coal Energy Portal. Even the Web Site Contacts page is confusing to use.
to find. Even if users do find it, they must identify the correct individual to contact. Given the number of possible contacts, errors are likely. Even if users do try to find the correct contact, no guarantee exists that users’ suggestions would be followed.

**Functionality**
The second interactive element I analyze is functionality. Functionality—the tasks that website users can perform—can make a website more engaging by occupying the users. A website that books flights, calculates postage, converts currency, or lets users shop for music is clearly more engaging. While there is a dearth of theory about how website functions act as communication elements, they are clearly important to engagement.

Even though functional website elements are clearly engaging, they may not be appropriate in all situations. The only form of functionality evident on the Coal Energy Portal is the drop down menus previously discussed. The menus serve the function of expanding the website’s navigational options in response to user action. This small example is the only form of functionality observable on the Coal Energy Portal. The page incorporates no tools, games, or activities. As with any website, users are free to view textual and visual information, but that is the extent of their freedom. Quite simply, users cannot actually do much of anything on the website. And even though the Coal Energy Portal uses little functionality, it does not seem to be lacking anything. Functionality may not be an appropriate element for this website.

**Hypermediacy**
The third interactive element I analyze is hypermediacy, which measures the degree to which a website interweaves information from many sources. Websites that are highly hypermediated connect to many other websites, giving users access to more and more information. The Coal Energy Portal is heavily hypermediated, as evidenced by the high number of menus and hyperlinks. The Coal Energy Portal indexes and links to information from multiple locations, both within and outside the Department of Energy’s website.

The Coal Energy Portal gives its users many content choices. They can select links from nine separate navigation menus (see Figure 4.7 next page). These menus open related websites about research programs, governmental organizations, and other sources websites. While these options bring many corners of the Department of Energy website to users’ fingertips, the most important hyperlinks do not use a menu at all. Instead, the key hyperlinks are embedded in a prose discussion. Selecting any of these embedded links leads users away from the Coal Energy Portal to more specific topical pages. These topical pages, too, are aggregates of still more pages.
The fourth interactive element I analyze is human personality. Interaction implies that users interact with something. In most cases that thing is the system, set up to respond to users’ activity. In other cases, that thing can be a rhetorical agent or third person (Burke 1969). The identity and character of that human personality can have a profound affect on the users’ experiences.

The Coal Energy Portal suppresses its rhetorical agent. Website users encounter information, but they do not actively engage with another personality. From an interactivity perspective, the Coal Energy Portal declines the opportunity to use an agent that could facilitate the user-system relationship. If users expect a primarily informative experience, the lack of human personality may have a positive affect. If users expect entertainment, the lack may have a negative affect. Testing this element might help differentiate what theory—human computer interaction (e.g., Shneiderman & Plaisant, 2004), user-centered design (e.g., Norman, 1989), and technical communication (e.g., Burnett, 2005) or new media studies (e.g., Manovich, 2001)—is most appropriate for this website.

**Interactivity Conclusion: Coal Energy Portal**

Like with multimedia, the Department of Energy’s Coal Energy Portal takes a minimalist approach to interactivity. The site uses few of the interactive elements that are evident in other websites. Declining to use user-generated content, functional elements, or a rhetorical

---

6 While “agent” is the appropriate rhetorical concept from Kenneth Burke, I use the term “human personality” to simplify design of the user testing presented in Chapter 5.
agent makes the website stark. The high degree of hypermediacy is a notable exception to the Department of Energy’s typical minimalism. Because of the shear size of the Department of Energy and the high number of related sites, the Coal Energy Portal must manage many hyperlinks. Generally speaking, though, the website uses little interactivity.

Artifact 2: Learnaboutcoal.org
The Department of Energy is not the only source of information about clean coal technology. Other entities present the same information in different ways. One such entity is an industry advocacy group called Americans for Balanced Energy Choices. While Americans for Balanced Energy Choices uses nearly identical sources for their content, their advocacy website, Learnaboutcoal.org uses a distinctive presentation to engage users.

The Department of Energy’s website can be characterized as a passive reference where users are responsible for finding their own content. Learnaboutcoal.org, on the other hand, is much more aggressively engaging (see Figure 4.8). The website actively seeks users

![Learnaboutcoal.org Front Page](image)

**Figure 4.8 The Learnaboutcoal.org Front Page:** Learnaboutcoal.org uses multimedia elements and interactive elements more than the Coal Energy Portal.
through television commercials and through human spokespersons on the website itself. This is indicative of a difference in attitude on Learnaboutcoal.org concerning combination of multimedia and interactive elements on the site.

**Multimedia Elements on Learnaboutcoal.org**

While the Coal Energy Portal uses a simple, textual style to engage users, Learnaboutcoal.org makes much greater use of multimedia elements. Learnaboutcoal.org embraces a technologically advanced combination of text, images, motion, and sound. In the four types of multimedia elements analyzed in this study—typography, images, motion, and sound—Learnaboutcoal.org is on the leading edge. The website successfully combines all four into a single, coherent and inviting page. A detailed look into the typography, images, motion, and sound of Learnaboutcoal.org illustrates that despite a few glitches, the website represents a very sophisticated use of multimedia technology.

**Typography**

The first multimedia element I analyze is typography. Similar to the Coal Energy Portal, Learnaboutcoal.org uses typographic conventions to identify text hierarchy and organize hyperlinks. It identifies headers, titles, captions, and body text (see Figure 4.9.1). The portal also uses web conventions to organize the hyperlinks; hyperlinks are set apart by color and underlining (Felici, 2004; Burnett, 2005) (see Figure 4.9.2), especially in body text. Hyperlinks in navigational menus rely on position and rollover affects to identify their function (see Figure 4.9.3).

![Figure 4.9 Typography on Learnaboutcoal.org](image)

**Figure 4.9 Typography on Learnaboutcoal.org:** Learnaboutcoal.org makes similar typographic choices to the Coal Energy Portal.
While Learnaboutcoal.org follows typography conventions overall, the home page has one unexpected use of typography. As seen in Figure 4.8 above, the home page includes three phrases.

- 250-year supply of coal in America.
- Half the cost of other fuels.
- Technology-pathway to emissions-free power plants

These three phrases cued as display text. Their color, size, and ragged position suggest they are not part of a navigational element or a continuous section of body text, but rather seem intended to increase the visual interest of the page. In fact, the phrases are hyperlinks that are identified by rollover effects, but not by typography conventions or position. They mirror navigational hyperlinks in the main navigation bar and may serve to assemble a linear argument on the page, but users are more likely to misidentify them as non-functional.

While Learnaboutcoal.org follows most typographic conventions, the site sometimes lacks consistency (like the example above). In those situations, users are more likely to misinterpret the website.

Images

The second multimedia element I analyze is the use of images. Like the Coal Energy Portal, Learnaboutcoal.org uses images to decorate the page. For example, the site uses images of children on every page, placed in the margins (see Figure 4.10.1). The marginal images seem to provide commentary on the primary content. While the marginal images provide an extra avenue by which to engage the content, the use of informative images would likely be more effective.

Figure 4.10 Images on Learnaboutcoal.org: Learnaboutcoal.org balances decorative and informative images.

7 In fact, they are not merely images, but full-motion videos with a soundtrack. When each video has finished playing, it remains visible with one of the frames displayed as a still image.
On Learnaboutcoal.org, informative images are commonly placed within the text rather than the margins (see Figure 4.10.2). Those images are used very differently than the images on the Coal Energy Portal. First, the Learnaboutcoal.org images are integrated parts of the argument rather than decorative additions. Second, the Learnaboutcoal.org images are visually consistent (see Figure 4.10.2). By integrating images into the argument and by using a consistent visual design, Learnaboutcoal.org makes better use of images than the Coal Energy Portal, possibly leading to a better user experience.

**Motion**

The third multimedia element I analyze is the use of motion. Like the Department of Energy’s Coal Energy Portal, Learnaboutcoal.org uses motion to hide hyperlinks. Dropdown menus open and collapse entire navigation menus (see Figure 4.11).

![Figure 4.11 Drop Down Menus on Learnaboutcoal.org](image)

Figure 4.11 Drop Down Menus on Learnaboutcoal.org: LearnAboutCoal.org employs more motion in its dropdown menus.

Unlike the Coal Energy Portal, navigation is not the only use of motion on Learnaboutcoal.org. In fact, nearly every website page uses an animated entrance. Hyperlinks fly in, the site title types itself letter by letter, and horizontal rules trace themselves onto the page. Advanced web technologies—in this case Flash™—enable the animation of any web element. Still, animated web elements are not the height of motion on Learnaboutcoal.org. The website also uses full-motion, full-sound video. While the Coal Energy Portal missed some obvious opportunities to use multimedia clips, Learnaboutcoal.org invents opportunities. The site uses a full third of its graphical space for videos (see Figure 4.12 next page), and new clips appear on nearly every page of the site.

Rather than provide more information, the videos seem to be attempts to humanize the site. How is the heavy use of motion likely to affect the users’ experience? On a basic level, the videos increase the visual interest of the site (Bolter & Grusin, 2000, p. 203). The greater interest comes at the possible cost of accessibility; users with slower download rates or inferior equipment will have a much different experience than those with state-of-the-art machines (Burnett, 2005). Finally, the use of video is the most prominent way that the website offers a rhetorical agent for the user to interact with (Burke, 1968), as discussed in the upcoming section on Human Personality.
If users prefer an immersive, entertaining experience on informal education websites, the use of motion on Learnaboutcoal.org will likely provide it. On the other hand, if users primarily want to use the site as a reference, the motion might frustrate them.

**Sound**

The third type of multimedia element I analyze is the use of sound. While sound was not a prominent element on the Coal Energy Portal, Learnaboutcoal.org does use sound extensively. Sound is embedded in the full-motion video clips (see Figure 4.12 above) described above. The child spokespersons each deliver a scripted monologue, framed as a conversation that provides commentary on the primary text. Like the videos themselves, the soundtrack does not provide much new information, but rather explicitly invites users to engage with other website elements.

Learnaboutcoal.org does allow users to stop the video or mute the sound. Mute or pause functionality is an important feature that gives users control over their experience. Instead, Learnaboutcoal.org begins the sound and video automatically, and the control to turn it off is not visually prominent—indeed, by default it is invisible. Users who do not want to listen to the script and do not figure out how to turn off the sound may perceive it negatively.

Just like with the videos, the unsolicited sound can have several effects. The sound increases the prominence of the spokesperson, almost to the point of intrusion. If perceived as an intrusion, the sound may depress user engagement. Users may decide to leave the site or deselect the sound and motion element.
Multimedia Conclusion: Learnaboutcoal.org

Learnaboutcoal.org makes ample use of multimedia elements. While some possible glitches exist in the use of typography, Learnaboutcoal.org does make sophisticated use of images, motion, and sound. In general, Learnaboutcoal.org has a more multimedia character than the Coal Energy Portal. The effect on users depends on what type of experience users expect. If users want a no-nonsense informational presentation, they may dislike Learnaboutcoal.org. If users want an entertaining, immersive virtual experience, they may like Learnaboutcoal.org.

Interactive Elements on Learnaboutcoal.org

While the Coal Energy Portal makes minimal use of interactivity elements, Learnaboutcoal.org includes interactivity as a major element. Interactivity is important to a website because it can help build a stronger relationship between a website, its audience, and its subject matter. A stronger relationship between these three entities suggests that the users are more engaged with the website itself and, by association, with its subject matter.

Of the four interactive web elements that are especially important to this analysis, Learnaboutcoal.org approaches three in a way distinct from the Coal Energy Portal. First, Learnaboutcoal.org includes user-generated content, at least superficially. Second, it reduces the level of hypermediacy with a simpler navigational scheme. Third, it makes heavy use of human personality. Like the Coal Energy Portal, Learnaboutcoal.org does not make much use of functionality. Examining each of the four interactive elements important in this analysis—user-generated content, functionality, hypermediacy, and human personality—characterizes Learnaboutcoal.org’s unique use of interactivity.

User-generated Content

The first interactive element I analyze is user-generated content. While the Coal Energy Portal did not allow much user-generated content, Learnaboutcoal.org prominently includes a weblog where users may post their own content and interact with the website managers. The website foregrounds the weblog feature by placing it on the introductory page of the website and by specifically referencing it in the site’s video commentary (see Figure 4.13 next page).

While the weblog does offer users opportunity to supply content, it does not seem to be a very neutral discourse space. Anyone may post to the blog, but the blog’s managers maintain control and can foreground or suppress user-generated content according to any criteria they choose. This structure lends itself to bias, and Learnaboutcoal.org does nothing to mitigate that bias. The blog’s author is not clearly identified (other than the name “Joe”). It does nothing to recognize the author’s bias. Owing to its failure to control or admit bias, the blog ends up presenting a one-sided opinion. On some occasion users challenge that opinion,
but challenges tend to result in the blog owners rationalizing their original opinion (see Appendix E).

Popular weblogs are a relatively new to in Internet culture, and they may have already peaked in popularity. The weblog on Learnaboutcoal.org is theoretically a good attempt at incorporating user-generated content. However, as it is implemented, the blog does not provide an open platform for users to engage in discussion. Any positive affect the blog might have had on users’ experience may be overshadowed by the specific problems with its implementation.

FunctionalITy

The second interactive element I analyze is functionality. As discussed above, websites that help users perform specific tasks are naturally more engaging than purely informational websites. The Learnaboutcoal.org uses slightly more functional elements, but those elements are still quite basic. For example, the weblog (see Figure 4.13 above) can be seen as a functional element that allows users to post opinions and respond to other users. Another web element on the Learnaboutcoal.org website that might be considered functional is the archive of commercials. The website uses television commercials to recruit users and stores them in an online archive.

Both of these examples are very basic forms of functionality, but both can be better explained as other types of elements. The weblog is better explained as user-generated content, and the archived commercials are better explained as further reinforcing human personality. Since functionality is barely used on the two websites being tested, it is not likely
to have a large effect on the user experience. It can thus be dismissed without losing much critical insight.

**Hypermediacy**

The third type of interactive element I analyze is hypermediacy. While the Coal Energy Portal uses an extensive amount of hypermediacy, Learnaboutcoal.org uses relatively less. The website indexes information from multiple locations, but uses only three menu areas, as compared with the Coal Energy Portal’s nine (see Figure 4.14).

The number of menus is not the only difference in the two websites’ uses of hypermediacy. Learnaboutcoal.org’s link structure is also simpler than the Coal Energy Portal’s and is arranged in a linear fashion. While the more ordered structure helps to make the site navigable, any benefit is offset by the lack of descriptive text (Burnett, 2005, Shriver, 1997). The links do not successfully identify the content being discussed. For example, the link “Ultimately Clean” presents information on the coal industry’s current progress in reducing emissions, but also on current research and development of clean coal technology. Also, more material exists about clean coal research under the link “Fuel of the Future.”

How does the simpler structure affect the users’ experience? Likely, users will be more likely to view the entire website and will be less likely to get lost or distracted while browsing. On the other hand, the less descriptive hyperlink labels might increase the difficulty of users choosing content on their own, forcing them to accept the arrangement indicated by Learnaboutcoal.org. This lack of choice may have a negative effect on the users’ experiences.
HUMAN PERSONALITY

The fourth type of interactive element I analyze is human personality. Interaction implies that users interact with something or someone. The identity and character of the communicative agent can have a profound affect on how the users to engage with the site (Burke, 1969). While the Coal Energy Portal doesn’t make significant use of human personality, Learnaboutcoal.org foregrounds an artificial human agent by including sound and video of child spokespersons (see Figure 4.15). Since the spokespersons directly address both the website’s users and its informative content, they deserve special attention.

Learnaboutcoal.org is graphically divided into three sections. The first section is navigational. The second section is a content area. The third section is reserved for child agents. A different child is featured on every page (see Figure 4.15). Using a child agent in this way has at least two consequences. First, the child is an example of unsolicited system-initiated interaction. Second, the child provides commentary on the informative elements of the page. If users reject the unsolicited interaction or the extra commentary, the website might alienate its users.

One unique consequence about using child spokespersons is that they are system-initiated interaction. Most interaction on the Internet is user-initiated. Users perform some action and then receive a response. Since the spokespersons begin to talk and move without any action from the users, they demand users’ response. The users must choose to listen
to each child’s argument, shut off the video, or close the browser. Only the first option is favorable to the website’s purpose.

Opening the website automatically initiates the child agent’s discussion, but that does not necessarily mark the beginning of the users’ experience with the website’s personality. Because Learnaboutcoal.org uses television advertisements that feature the same children, the website often initiates a relationship well before users even open a browser. This suggests that users who have seen a commercial will have a different experience than those who have not, since the audience-agent relationship is already established (see Figure 4.16).

![Figure 4.16 Human Personality on Learnaboutcoal.org’s Commercials: Each agent is also featured in a television commercial and is available for download on the site.](image)

The spokespersons on Learnaboutcoal.org do not offer much new content, but rather provide commentary about information presented elsewhere on the site. This adds a level of mediation to the information. This may be intended to make the information more approachable; for users who might not be totally comfortable with the site otherwise, the child spokesperson can tell them everything they need to know. Furthermore, the child will often direct users to specific content, as when Danielle states “Hey, there’s even a blog where you can share your ideas too!” on the website homepage (see Figure 4.17 next page).

Website users may respond in a number of different ways to the use of human personality on the Learnaboutcoal.org website. Users might consider the system-initiated interaction to be too invasive. On the other hand, they may consider it a welcome feature that humanizes the site. Users might consider the use of children to be deceptive, or over-simplified, or condescending. Or the users might prefer it and take on a parental role (Burke, 1969). The possible variability in users’ experiences implies a great risk in this use of a human personality.
Summary of Critical Analysis of Engagement Elements for both Websites

Limiting this discussion to a select few engagement elements that are prominent on the websites being tested makes a critical analysis possible. Even discussing a limited number of multimedia and interactive elements illustrates that the two websites—The Coal Energy Portal and Learnaboutcoal.org—make very different assumptions about the type of engagement sought by website users. By organizing itself as a textual, hypermediated reference site with little motion, sound, or human personality, the Coal Energy Portal invokes information seekers dedicated to finding specific information as quickly as possible. Conversely, Learnaboutcoal.org uses typography, human personality, imagery, motion, and sound to create an immersive online multimedia experience that invokes an audience interested in being lead through the content in a linear fashion and entertained along the way. What remains to be seen is whether actual users identify themselves as information seekers or as entertainment seekers.
CHAPTER 5. STUDY RESULTS

Science and technology change dynamically, especially in the field of energy generation. When the general population notices these changes, they must make a decision about how to respond, whether that means actively supporting research and development, actively opposing it, or ignoring it all together. Choosing the response is easier when people interact with one of the boundary objects that introduce scientific and technological arguments to the public.

In the case of the research and development of clean coal technology, two of these boundary objects are the Coal Energy Portal and Learnaboutcoal.org. To understand how users respond to these websites, I conducted a survey of university honors program students as representatives of civically and politically engaged individuals. The survey examines two general concerns:

- responses to engagement elements used by each website: motion, sound, and human personality
- responses to the arguments on each website overall

The data collected in the survey suggest that the engagement elements on Learnaboutcoal.org reduce users’ engagement. Regardless, users responded favorably to both websites overall. Data gathered from follow-up interviews helps account for this result. These interviews suggest that users are willing to separate their response to multimedia and interactive elements from their response to the website as a whole. This chapter presents the results of the survey and interviews.

Response to Engagement Elements

First, I consider the response of users to specific engagement elements. User responses were different depending on the site they viewed. Generally speaking, users displayed three trends.

- A mixed response to motion
- A negative response to sound
- A mixed response to personality

While these trends emerged from the survey data, interpreting them requires looking at data from users’ interviews. To characterize these responses, I present both types of data in the rest of this section.

---

8 All survey data are included in Appendix A.
Response to Motion Elements

Users were asked to gauge their perception about the amount\(^a\) and quality of motion on the website they were assigned to use. The results are displayed in Figure 5.1. As expected, the users who browsed Learnaboutcoal.org identified more motion (mean 1.4) than those who viewed the Coal Energy Portal (mean 0.1). The users who browsed Learnaboutcoal.org on average reported that the motion had a mildly positive effect on their engagement (mean effect on interest 1.0 / mean effect on willingness to spend time 0.7). On the other hand, the users who browsed the Coal Energy Portal, with essentially no motion to evaluate, reported very low effects on engagement (mean interest 0.4 / mean time 0.2).

![Figure 5.1 Motion Amount Affect: Users reported how the amount of motion affected their interest in the website and their willingness to spend time browsing it.](image)

Users also evaluated the quality of the motion they saw, as displayed in Figure 5.2. Both the users who browsed Learnaboutcoal.org and those who browsed the Coal Energy Portal judged the quality of motion for the site they viewed as moderate (Learnaboutcoal.org mean 1.7, Coal Energy Portal mean 1.6). The users of Learnaboutcoal.org reported similar responses to motion quality (mean interest 1.2 / mean time 0.7) as they reported to motion amount (mean interest 1.0 / mean time 0.7). However, users of the Coal Energy Portal reported a notably better response to motion quality (mean interest 1.4 / mean time 1.6) than to motion amount (mean interest 0.4 / mean time -0.2) (see Figure 5.2 next page).

\(^a\)Since an amount below zero is nonsensical, only answers above zero were valid for all survey questions regarding the perceived amount of something.
Interpreting these results is easier in light of the user interviews. The three users I interviewed confirmed that motion had various affects. For example, in an interview, User 1 reported a positive but skeptical response.

I don’t know that I’ve seen any video as well-produced and placed into a website as this girl here. I was very impressed by the technological aspects behind it then again, I’m very aware that anyone can produce a website or a pamphlet or a flier to make themselves look good.

User 1 Interview, lines 63-69

Given that User 1 talks about the video in general, users may be more likely to evaluate the motion, sound, and human personality of an element all at once rather than one at a time. The interview data are clearer when the user discusses elements that can only fit in one of the three types—just motion, for example, and not sound or personality. For example, in an interview, User 2 responded to the animated navigation.

…and the motion I talked about when I said the positive impact is that the, uh, the toolbar was kind of cool

User 2 Interview, lines 359-361

The tendency of users to have a particular element in mind suggests that their responses may not be based on all of the motion elements equally but on a selection unique to their experience.

Figure 5.2 Motion Quality Affect: Users reported how the quality of motion affected their interest in the website they viewed, and their willingness to spend time on it.
While users on average seemed to favor motion, some users placed conditions on the use of motion. For example, in an interview, User 3 was quite satisfied that the Coal Energy Portal used essentially no motion.

…if it says there’s a movie and I’m enticed to see the movie, then that’s ok but, but like, stuff that’s going on, sort of without my control, just drives me nuts, so I mean in that sense it’s nice that there’s no like random, you know, sounds when you mouse of over? the link or something.User 3 Interview, lines 164-168

This meshes well with user centered design and human computer interaction preference for deferring control of the experience to the user.

Generalizing from the interview and survey data, users had a mixed response to the amount and quality of motion on both websites. Their specific response depended on which motion element they scrutinized, whether it was also linked to sound and human personality elements, and whether it gave the user a choice over whether to use it. Even though motion, according to the interview participants, may be an opportunity to engage the audience, users who didn’t experience any motion did not indicate that it harmed their engagement.

**Response to Sound Elements**

The appearance of motion is often closely associated with sound elements on the web, as is the case on the websites being tested. Users were also asked to gauge their perceptions about the amount and quality of sound on the website they were assigned to use. Users who browsed Learnaboutcoal.org saw much more motion (mean 1.5, see Figure 5.3) as compared...
to those who browsed the Coal Energy Portal (mean 0). The users of Learnaboutcoal.org, who reported higher sound, also reported that the sound had a low positive effect on their interest in the site (mean 0.4) and their willingness to spend time on it (mean 0.5). The wider spread of these distributions suggests that a greater portion of the population had a more negative response (st dev interest 2.6 / st dev time 2.0). The participants who browsed the Coal Energy Portal and reported no sound also reported that the lack of sound had a somewhat positive influence on their interest and willingness to spend time (mean interest 1.3 / mean time 1.0). The narrower distribution (st dev interest 1.4 / st dev time 1.7) of these populations suggests that relatively fewer users reported an adverse effect on interest and willingness to spend time on the site.

Users also evaluated the quality of the sound they experienced. Both the users who browsed Learnaboutcoal.org and those who browsed the Coal Energy Portal reported moderate quality of sound (Learnaboutcoal.org mean 1.9, Coal Energy Portal mean 1.6, see Figure 5.4). Those who used Learnaboutcoal.org reported that the quality of sound had a moderately favorable effect on their interest (mean 1.4) and a slightly favorable effect on their willingness to spend time on the site (mean 0.6). The low mean and high standard deviation (1.7) for the users’ willingness to spend time on the site suggest more users had a more adverse response to the quality of sound.

The users who browsed the Coal Energy Portal reported moderately favorable responses to the quality of sound on the website (interest mean 1.5 / time mean 1.5).

Interpreting these results is easier in light of the user interviews. Both groups of interview subjects—those who saw Learnaboutcoal.org and those who saw the Coal Energy

![Figure 5.4 Sound Quality Affect](image)

*Figure 5.4 Sound Quality Affect:* Users reported how the quality of sound affected their interest in the website and their willingness to spend time browsing it.
Portal—expressed negative opinions about sound use on websites. This was certainly true for those who saw Learnaboutcoal.org as illustrated in this interview comment from User 2.

I sat and I listened to it, you know. I heard her out, and I didn’t really go about navigating the website while she was talking, but, you know after she was done, then I was able to kind of forget about that and I looked at what the website had to offer—a mhmm—and that’s, that’s actually when I became interested, was when she stopped talking.

User 2 Interview, lines 156-182

User 2 seems to see sound as an obstacle to communication. This was a common response. Even interview subjects who viewed the Coal Energy Portal and who did not experience sound voiced a dislike for sound on web pages, as in this comment from User 3:

Interviewer  What do you think about the amount of motion that’s here on the site, sound and motion, kind of multimedia features?

User 3  There aren’t any really. That I found really, and I didn’t find a lot of mhmm...What do you think about that?

User 3  I hate background sounds; it drives me nuts

User 3 Interview, lines 156-162

User 3 volunteers a dislike in lieu of answering the question. Sound elements have enough of a negative influence for this user to actively discourage their use.

The study participants seem to dislike the use of sound overall. Still, individual users can respond in a range of ways. Some participants, like in Interview 3, imply that sound on websites might incur rejection from the users. Other users, like User 2, suggest that they are willing to wait and ignore the sound if possible.

Response to Human Personality Elements

Users were asked to report their perception of human personality on the website they were assigned to view. Those who viewed Learnaboutcoal.org reported more personality (mean 2.1) than those who viewed the Coal Energy Portal (mean 1.2, see Figure 5.5 next page). When gauging the ways in which the human personality affected their interest, users who viewed Learnaboutcoal.org reported a slightly positive affect (interest mean 1.1, time mean 0.8). Given the wide distribution of those populations (interest st dev 1.8, time st dev 1.8),
a greater portion reported a more adverse affect. On the other hand, users who browsed the Coal Energy Portal who reported a lower perception of human personality also reported a more positive affect on engagement (interest mean 1.6, time mean 1.7).

Users were also asked to report their perception of the quality of the human personality. Both the users who viewed Learnaboutcoal.org and those who viewed the Coal Energy Portal reported moderate quality (Learnaboutcoal.org mean 1.8, Coal Energy Portal mean 1.6, see Figure 5.6). Both groups reported that human personality affected their engagement positively, but the interest and time responses varied greatly. For those who used Learnaboutcoal.org the engagement response to personality quality was widely distributed.
(interest st dev 2.0, time st dev 1.8). The same was true for the engagement response to personality quality for those who used the Coal Energy Portal (interest st dev 1.8, time st dev 2.2).

Looking at the interview data sheds further light on the survey responses. Even single users had varied responses to the personality on the website. For example, the response of one of the users who viewed the Learnaboutcoal.org ranges from near hostility to skepticism to mild approval. Early in the interview, User 1 offers some harsh criticism of the human personality.

She knows nothing about coal. She is reading a speech. And probably getting paid fairly well to do so. Perhaps a daughter of one of the rich people who’s creating this website.

User 1 Interview lines 103-105

Later, User 1 seems to praise the quality of the human personality.

This website in this browser window appears almost like a, another human speaking to you (mhmm) and this came much closer than most websites in existence today because it has this nice video and this girl talking directly to you.

User 1 Interview lines 131-134

In yet another excerpt, User 1 expresses doubt about the credibility of the human personality on the website.

I don’t think there is any harm in having a nice pretty little girl here telling you about what is being done with coal, but then to really back up their claims it’d be nice to have some, not politician, but some scientists, although its hard to gauge a scientists credibility either.

User 1 Interview lines 294-298

Other interview participants seem to consider the human personality on the website to be too artificial to be successful, as in this comment from User 2.

Like I said, there didn’t seem to be much personality, cuz, it seemed like, she was just reciting, lines that had been given to her. She, the impression that I got was, ok, here’s a child, she is
an actor, she’s been told, to, talk like this and be like this and she’s doing that cause that’s what she’s good at.

User 2 Interview lines 137-141

The many variations of opinions about human personality on this website, even for single users, suggest that human personality elements are more complex and less predictable than motion or sound elements. The fact that users reported a wide range of responses in the survey with regards to human personality’s affect on engagement is not surprising.

Looking at all three elements, some trends seem to emerge. While users seem to respond favorably to the multimedia and interactive elements of these websites, they may merely be generous critics, overlooking things that they dislike. Interviewing some of those users further suggests that users are generous critics. Even though the users are not always resolute about their judgments, they clearly have an understanding of what they like and dislike about motion, sound, and human personality on these two websites. Taking the surveys and interviews together, motion and sound seem to have a mixed effect on user engagement, and sound seems to reduce user engagement.

Responses to General Arguments
With regard to the multimedia and interactive engagement elements on the website, users generally report a mixed response, or a positive response under certain conditions. However, users also seemed able to ignore the elements that evoked a negative response. The ability of users to look beyond those elements is also apparent in the users’ responses to the website in general. For both the user group assigned to the Coal Energy Portal and for the one assigned to Learnaboutcoal.org, the positive trend is clear in two categories:

- Attitudes toward coal energy and coal energy research
- Attitudes toward the publishing entity

Both survey and interview data suggest that the users respond favorably to the website as a whole, despite their mixed responses to some of the individual elements.

Attitudes Toward Coal and Coal Research
Users were asked to report their opinion about coal energy both before and after using their assigned website. While the majority of users initially reported a negative opinion about coal, they reported more positive attitudes towards coal energy after using the website. The improvement in opinion was similar in magnitude regardless of which site the user browsed. The users who viewed Learnaboutcoal.org reported an average positive opinion change of
2.1. The users who viewed the Coal Energy Portal also reported an average positive opinion change of 2.1 (see Figure 5.7).

Users were also asked to report the ways in which the websites affected their support for research about coal energy technology. Like their opinion of coal energy in general, both the users who viewed Learnaboutcoal.org and those who viewed the Coal Energy Portal reported an increase in their support for coal research. Those who viewed Learnaboutcoal.org reported that their support for coal research increased by 1.0 (see Figure 5.8). Those who viewed the Coal Energy Portal reported that their support for coal research increased by 0.9.

**Figure 5.7 Opinion of Coal**: Users reported their opinion of coal energy before and after viewing their designated website. Both users who viewed Learnaboutcoal.org and users who views the Coal Energy Portal reported a 2.1 increase in opinion.

**Figure 5.8 Support for Research**: Users of both Learnaboutcoal.org and those of the Coal Energy Portal Reported that their support for coal energy research increased after viewing their assigned website.
Interpreting the increase of opinion of coal and support for coal energy research is easier when looking at data from users’ interviews. Users reported that the websites encouraged them to see coal in a new light. One example comes from User 2.

I was really impressed, when I read this, that the uh, they’re trying to get to a zero-emissions.

User 2 Interview, lines 51-53

Before seeing this stuff, you know, well, coal is, you know, something in the past. We’re moving on, we’re gonna find better things.

User 2 Interview, lines 68-70

For User 2, the most appealing topic is the possibility of future development. The opinion of coal is linked to an impression of whether coal research is stagnant or progressive. The sentiment about the importance of progress is echoed by the other participants I interviewed.

Seeing that some scientific research is being made toward cleaning up coal rather than keeping it as the old nasty dirty processes of the past is a step in the right direction, I suppose.

User 1 Interview, lines 231-233

I think, well, as I found out what’s going on its like, oh, this is kind of cool, like, this is actually doing something, then, sure, we should keep research this.

User 3 Interview, lines 134-136

The users I interviewed seemed to be enthusiastic about scientific progress. Prior to viewing the website, they tended to consider coal energy and coal energy research a stagnant field. They also tended to see coal energy as a necessary evil. The current research they were exposed to, either on Learnaboutcoal.org or the Coal Energy Portal, challenged their assumptions about the scientific progress of coal. While not every doubt was eased, the possibility of progress was enough to override negative responses to specific engagement elements.

**Attitudes Toward the Publishing Entity**

Users were asked to report their familiarity with the entity that published the website they viewed both before and after viewing the website. The users who viewed Learnaboutcoal.org
initially reported no familiarity with Americans for Balanced Energy Choices. After viewing the website, their average familiarity increased to 1.1 (see Figure 5.9). In a similar way, users who viewed the Coal Energy Portal reported that their familiarity with the Department of Energy increased on average from 0.7 to 1.5. Neither of these results is surprising, given the relative obscurity of both entities in the general population.

Users were also asked to report their opinion about the entity that published the website they viewed both before and after their experience. Opinions of Americans for Balanced Energy Choices varied widely both before and after viewing the website (initial st dev 1.7, final st dev 1.1 see Figure 5.10). Prior to viewing the website, users opinions about Americans for Balanced Energy Choices were evenly split (mean 0.0). Afterwards, the opinions increased to an average of 1.1.

While the change was not as pronounced, the users who viewed the Coal Energy Portal had a similar increase in their opinion of its publishing entity, the Department of Energy. After viewing the website, users of the Coal Energy Portal reported that their opinions increased by an average of 0.6 (see Figure 5.10).

Data from the user interviews can help to characterize the increases in users’ familiarity with and opinions of the publishing entities. While users admitted that they were somewhat more friendly towards the entity after viewing the website, they tended to minimize this increase. This is certainly evident for the users who viewed Learnaboutcoal.org, which was published by Americans for Balanced Energy Choices.
Who funded this group.. its just a name right now (right) I don’t see any names or pictures or what companies they run
User 1 Interview, lines 238-239

Despite being more familiar with the publish entity, that familiarity does not go far beyond simple awareness of the entity’s existence. Users who viewed the Coal Energy Portal, which was published by the Department of Energy, reported a similarly minimal familiarity.

I knew they existed; I knew they worked on energy things for the units states I mean, but, not really.
User 3 Interview, lines 103-105

I, I have opinions about government in general, so I suppose those sort of trickle down, you know, but….
User 3 Interview, lines 111-112

While mere exposure seems to be a good thing for both Americans for Balanced Energy Choices and for the Department of Energy, the websites that users viewed seemed only barely sufficient. The interviews indicate that users were not completely satisfied with the information they received and that the positive influence reported on the surveys may represent only that a majority of users had a very slight positive response.
Overall Results

Users seem to apply a very complex decision making process to viewing informal education websites about science and technology. The survey data presented here helps to characterize that process in a general way. Considering the data reported by study participants during interviews helps to provide a more detailed understanding about the ways in which users respond to informal education websites.

Generally speaking, users displayed three responses to the engagement elements on both Learnaboutcoal.org and the Coal Energy Portal.

- A mixed response to motion
- A negative response to sound
- A mixed response to personality

Even when the survey data indicated that multimedia and interactive elements reduced user engagement, the users’ interviews suggested that users were willing to overlook those elements. This seemed possible mainly because the websites appeared professional and well-designed and because they presented information about scientific progress—a topic to which all interviewed users responded positively.

Given that the users were willing to set aside their negative reactions to some engagement elements, their generally positive responses to the websites as a whole are not surprising. This emerging trend suggests several conclusions about the ways in which informal education websites about science and technology work and about the ways in which users respond to the engagement elements on those websites. These conclusions are discussed in more detail in Chapter 6.
CHAPTER 6: DISCUSSION, IMPLICATIONS, AND CONTINUED RESEARCH

Some areas of scientific research and development are especially important to the lives of the public. Energy research—especially research into clean coal technology—is an increasingly discussed scientific and public topic. The relationship between clean coal researchers and the general public faces rhetorical challenges. Coal has been associated with a negative cultural subtext since the days of the Industrial Revolution. Given this negative association, the government and the coal industry must recast coal energy in a positive light. One place where this recasting happens is on informal education websites that bring scientific and technical arguments to the general public.

While informal education websites have many important elements, this study focuses only on those that contribute to audience engagement. Because I believe a highly engaged audience is more likely to accept and act on the arguments made in informal education websites, I used critical analysis, survey research, and user interviews to answer two questions:

- What website elements affect the public’s engagement in addressing major technological problems such as energy needs?
- How does the public respond to those elements?

Because the critical analysis in Chapter 4 found that motion, sound, and human personality were the most prominent website elements affecting user engagement on the two websites being tested, I focused on those elements in particular. The survey and interview results presented in Chapter 5 suggest conclusions that can be separated into two categories: responses to the specific engagement elements being tested and responses to the overall arguments of the website. This distinction is necessary because users showed a remarkable ability to separate their interest in the content of the website from their reaction to the engaging elements on the site. While users did notice that motion, sound, and human personality are of varying amount and quality on the websites, they rarely reported enough of a reaction to prevent them from reading and accepting the websites’ arguments. This chapter seeks to explain that response.

Response to Three Engagement Elements

Many kinds of website elements can be catalogued and tested. While the list is potentially enormous, it is possible to focus on only a few elements of particular importance (see
Appendix D). In this study, I am particularly concerned with the elements that contribute to audience engagement. Of these elements, the websites being tested showed the most difference in the use of motion, sound, and human personality elements. The website produced by the Department of Energy—the Coal Energy Portal—makes sparse use of multimedia elements like motion and sound, and uses only a little personality constructed in written text. The website produced by the advocacy group Americans for Balanced Energy Choices—Learnaboutcoal.org—uses motion and sound extensively and uses prominent spokespersons on nearly every page of the website. Users who viewed the website with more prominent engaging elements reported a higher perception of motion, sound, and human personality. In some cases this corresponded to a difference in their response, but the difference was not universal and was rarely extreme enough to greatly damage the users’ opinions of the website’s content. This was essentially true for each of the engagement elements being tested—motion, sound, and human personality elements.

Response to Motion Elements
For the users in this study, the presence of motion evoked a mix of responses. Users who were exposed to the site with more motion did report a higher perception of motion. They also reported a slightly higher level of engagement as measured by their overall interest and their willingness to spend time on the site. As expected, users who saw the Coal Energy Portal, which used little motion, reported almost no motion and reported a correspondingly minimal affect on their engagement. Interestingly, despite having almost no motion to look at, users of the Coal Energy Portal still reported roughly the same quality of motion and roughly the same positive response to that motion’s quality as users who saw Learnaboutcoal.org.

What can be concluded from the fact that the users who saw almost no motion still looked on the quality of that motion favorably? Possibly, the users thought that omitting motion elements was an appropriate choice for this website. Users may see motion as an ancillary feature that is preferably omitted on informal education websites. This conclusion, however, leaves another unanswered question. If the absence of motion is good, why did the participants who used the motion-heavy Learnaboutcoal.org site respond favorably to it as well? One answer may be that users are generous critics, reporting a favorable score even for average artifacts. Without stimuli, users may default to what would be their average response. If the users naturally inflate their average evaluation, it would suggest that the users responded neutrally to the quality of motion elements on both sites.
The variety of possible conclusions suggests that more detailed information is required to finally determine what makes motion a positive or negative element. During the interview phase of the project, the study participants themselves helped to answer this question. Interviewees identified competing factors in their response to motion. One factor was how technologically impressive the motion was. By citing the high visual quality and the degree to which the motion was integrated into the website, users clearly suggested a positive response to the display of technological proficiency embodied in motion elements. Another factor was the motion content itself. As noted in the interviews, motion elements that were non-content bearing—navigational or showcase motion—were generally liked, so long as they did not impair users’ ability to access the content itself.

How do users respond to motion? How should motion be used? Based on the results of this study, motion is seen favorably by audiences. However, this applies with two at least two caveats. First, the motion should be good quality and professional-looking for maximum effect. Second, the motion should not interfere or obstruct access to the content of the website. But just answering these two caveats does not guarantee the motion will be effective. Websites can display a professional design without using any motion. Or a website might not have any worthwhile content to obstruct. One way to use motion is in non-content-bearing elements. Adding motion to elements that don’t carry content, such as page transitions and navigation elements, is one way to make use of the technologically impressive nature of motion without the risk of obstructing the content.

Response to Sound Elements
Sound, the second element, tended to evoke a more negative response than motion. The users who were exposed to Learnaboutcoal.org—the more multimedia-heavy site—reported more sound than those who saw the Coal Energy Portal, as expected. While users of both websites reported that the amount of sound was a positive interest factor, the users who were exposed to no sound reported a greater positive influence on their engagement than those who did hear sound. Because more sound evoked a lower positive engagement influence, sound amount can be considered to reduce audience engagement element on these two websites. The sound quality shows a similar pattern.

What does this say about the use of sound on the web? Despite the positive interest effect reported by the users, sound seems to lessen interest relative to the other elements tested. Users’ interest and willingness to spend time on the site were noticeably lower for the sound-heavy site than the moderate score that seems to serve as users’ default answer. A greater number of users were more displeased by the use of sound than by its absence.
The users I interviewed, regardless of which website they experienced, confirmed that sound has a depressive effect on their engagement. Those who used the Learnaboutcoal.org site considered the use of sound at least a mild irritation. In so far as sound was an integral part of the video elements of the website, users considered it to be technologically impressive, but users were still relieved when the minute and a half of sound and video was finished. At that point, study participants seemed to reset their user experience. To get through the website, users had to separate their response to the sound and video clips from their response to the website in general.

The ability of users to separate their judgment of the website’s content from their response to its engaging elements is remarkable. Even if users reacted negatively to an engaging element, they tolerated that element if the website promised to deliver content that interested them. If users commonly approach websites with this sort of generous attitude, several interesting questions are suggested. How bad does a video and sound clip have to be before it affects users’ response to the content itself? How long will users tolerate introductory engaging elements that they dislike? What makes those clips more or less tolerable? What must the rest of the website be like for users to grant it this kind of generosity? These answers likely depend on the users. Some users may reject any website for the slightest use of sound, while others may be willing to tolerate more.

How should sound be used on a website? According to the results of this study, probably as little as possible. And perhaps this extends to informal education websites, since users in this study found websites with sound less interesting than those without. Using sound clips may be a risky design decision. However, that risk can be mitigated if it is offered as optional content and not an integral part of the website.

Response to Human Personality Elements
Human personality, the third element studied, evoked a mixed response in much the same way that motion did. In the survey, users who viewed Learnaboutcoal.org saw more personality and seemed to disfavor the increased amount less than users who views the other site. However, little opposition exists to the use of personality, especially when compared to the trend opposed to sound. Once again, the detailed information from the interviewed users provides more insight into the survey data. Interviewed users suggested a lot of variation in their interpretation of the human personality elements.

How do users regard human personality on websites? What was the response to personality? What seems more important to users than the presence of personality is the character of the personality itself. In interviews, the users who were exposed to the
Learnaboutcoal.org website suggested that the personality used on the website—the children themselves—was not particularly effective. These users considered themselves skeptics and stated a preference for the information of the website over its human personality. However, they did not reject the use of personality out of hand. Instead, they offered conditions for how personality might have been better used. For example, they would have responded more positively to a notable authority—someone in science or government. If Learnaboutcoal.org had used spokespersons that matched the information content of the website better, they might have had more successful. However, even though the users thought another kind of personality would be more persuasive, this may not be true for every audience. Another demographic might respond more favorably. Still, if using child spokespersons was intended as a way to humanize the website and make it more user friendly then the strategy failed resoundingly for these users.

The data suggest a few conclusions about human personality. First, very fine instruments are necessary to study users’ response to personality on websites. User responses were complex, but they do suggest a better testing methodology. The use of human personality or rhetorical agent might be very persuasive, but only if there is a strong match between the character of the personality, the content being delivered, and the target audience. The strength of this match cannot be predicted prior to studying the specific situation of a website being tested. Carefully studying the match between the characteristics of the personality, the content being delivered, and the target audience should occur both before and after deploying a solution, to verify that the match is appropriate.

Response to Overall Arguments
Overall, users were not particularly impressed with the use of motion, sound, or human personality on the two websites being tested. In all cases, the users exposed to the website with higher motion, sound, and human personality reported similar or reduced levels of interest than their counterparts who were exposed to less. However, the information gathered from these users does not rule out the use of motion, sound, and human personality. Instead, it suggests that motion and human personality can be useful if employed carefully and in the right situation. Sound elements seem to be the most difficult to employ successfully. Still, for the websites tested, users were not impressed with the implementation of any of the elements.

Even though users’ responses to motion, sound, and human personality were mixed, users seemed to respond positively to the websites overall. Looking at the users’ responses to the websites in general reveals some interesting results. In every question about the users’ responses to the website overall, study participants reported a favorable reaction, both in
survey and interview data. What becomes clear is that publicity and professional content seem to be important to the overall response of users, regardless of the multimedia and interactivity elements used on the site. Even if users initially reacted negatively towards the engagement elements, they were able to set that reaction aside and evaluate the content separately. This was true both for users’ attitude toward coal and coal energy and for users’ attitudes toward and familiarity with the publishing entities.

**Attitude Toward Coal and Coal Research**

Despite the mixed reaction to motion, sound, and human personality, users still seemed to respond favorably to the website in general. This is clear in their response to questions about coal and coal energy. Users of both websites initially reported negative opinions about coal and relatively low support for coal energy research. After viewing the website, both groups reported more favorable attitudes. What is most interesting is that the relative increase was very similar, regardless of which website the users experienced. Users reported a similar response for their support for coal energy research. Specifically, most users were in favor of research prior to using the website, but more were in favor of it afterwards.

Accounting for the initially negative opinions of coal held by study participants is straightforward. Most people seem to associate coal with negative social and environmental conditions that began with the industrial revolution (Davis, 1982). Coal energy is seen as an outdated, stagnant technology. The study participants were unaware of the environmental improvements that have been made to coal and initially had limited knowledge of clean coal technology.

Exposure to the website changed that. Granted, the information presented on the websites is selective and omits many of the potential consequences and difficulties that come with clean coal technology. However, the users of both websites ended up with a great deal of information that they did not have before. The exposure seemed to have a positive influence on users’ opinions about coal and coal energy research. The increase in positive opinions should not suggest that users were completely convinced about clean coal technology, though. User interviews still suggest a fair amount of skepticism. Overall, the website succeeded in convincing users that environmentally friendly coal energy was at least possible, which seemed to be an important factor influencing users’ opinions of coal energy and coal energy research.
Attitude Toward and Familiarity with Publishing Entity
In the same way that mere exposure to content was a positive factor in users’ opinions about coal and coal research, exposure to content also improved the users’ familiarity with and opinion about the entities that published the websites. To begin with, users had little experience with the Department of Energy and almost no experience with Americans for Balanced Energy Choices. As might be anticipated, viewing a website created by either of these entities increased user familiarity at least a little for the majority of users. And, since both websites were carefully constructed to include elements that would give a positive impression, users of either website reported a more positive opinion of the entity than they had previously held.

Accounting for the improved user opinion of the website entity is straightforward. Prior to using the website, most users said they had little information. With so little information to work from, users did not have a well-formed opinion of either the Department of Energy or of Americans for Balanced Energy Choices. The sense that arose from the survey and interview data was that any information, even tangential information, increased users’ perceptions of their familiarity with the publishing entity.

Data collected about users’ opinions of the publishing entity were in line with expectations as well. Given that the websites are trying to provide as positive a picture of their publishers as possible, users were somewhat more likely to report improvements in their opinion of those authors. Despite mixed responses to specific website elements, users reported favorable responses to the website overall. Just as they were able to separate their opinion of the website’s contents from their response to website elements, so too did they seem able to separate their responses to website elements from their opinion of the publishing entities.

Questions and Counterarguments
While the information gathered in this study points towards a number of interesting conclusions, it by no means answers all of the questions with surety. Because of the limits of this study, several important questions are left unanswered. However, the information collected here suggests at least four methodological extensions of this study that could work toward addressing unanswered questions:

- Use larger and broader samples,
- Develop a more detailed approach to analysis of website elements.
- Examine additional factors.
• Examine more websites.

The first direction of research that this study points to is larger and broader samples. This study has produced some interesting trends for a small population of users in a narrow demographic. Twenty university honors students—ten per site—evaluated each of the two websites, and three were interviewed. Repeating the study with more users from this demographic might establish trends more clearly. Furthermore, different populations may have different responses to website elements. A larger sample, or samples of other populations, might be able to identify which groups of users respond to which website elements and might help to anticipate future user responses.

The second direction of research that this study points to is a more detailed approach to website elements. Users did not have one-dimensional opinions of engagement elements. Rather, they balanced competing factors to arrive at an opinion. For example, in this study users evaluated the impressiveness of the technology and the intrusiveness of the engagement elements at the same time. Other factors may have been at work as well. Website elements can trigger more than one response simultaneously. Knowing the range of competing responses will be an important step to understanding the ways in which users shape an overall response. Another important step will be to determine which competing responses tend to be the most influential.

The third direction of research that this study points to is examining other factors. Focusing on only a few website elements was necessary because of the limitations of the study. However, engagement elements are not the only elements that are important. Other elements, such as the content of the website and its accessibility, are also important. For example, users in this study were willing to set aside their dislike for sound and motion in part because the content was interesting to them. This study isolated elements by analyzing two websites to determine which elements were the most distinct. However, comparing the influence that different elements have on users may lead to a better understanding of which types of elements are most important.

The fourth direction of research that this study points to is examining more websites. The two websites being tested in this study are useful and interesting because they take very different approaches to presenting the same content. However, they represent a very small set of data. Many other websites use similar engagement elements, and each one represents a unique solution. Having one user look at many websites with specific focus on one type of website element will produce interesting data. For example, motion was an important element in this study. One website uses essentially no motion. The other used several types
of motion elements to varying degrees. Looking at a broad range of websites that employ motion elements in distinctive ways will give a fuller set. Also, with many more data points, isolating the users’ responses to motion may be easier. This type of study, repeated for many elements, would help characterize users’ responses to many additional kinds of website elements.

**Implications for Websites**

Taken as a whole, the results of this study suggest several things about the relationship between presentation and information. First, users have responses to and opinions about specific website elements. The users’ overall responses to any of these elements are combinations of competing positive and negative factors. For example, users can be impressed by technologically advanced elements, disinterested because of mismatched content, or annoyed at unsolicited sound and motion.

Second, some things can be categorically stated. Motion is usually seen as impressive and tends to evoke a mixture of positive and negative responses. The same is true of human personality. Sound is usually seen as an irritation even if the quality is high. What seems to really matter, though, is the actual implementation of motion, sound, and human personality. The only way to be sure that the informal education website is successful is to test for the specific combination of content, audience, and engagement elements.

Finally, this study also suggests something about the behavior of website users. Users seem to approach the material generously. If a website is otherwise professional-looking in design and has sufficiently interesting content, users are willing to forgive gaffs in website elements that are not implemented particularly well. Users tend to treat websites generously, especially if those websites offer content that is personally interesting, or if the website is designed with a certain level of professionalism.

**Implications for Informal Education**

Informal education is a key part of science and technology. As science and technology continue to become a more important part of everyday life in our society, the public’s stake in science and technology will continue to grow. At the same time, the public will become more responsible for contributing to the scientific process. This requires bridging the communication gap between the scientific community and the general public.

One scientific issue that follows this pattern is energy and energy research. Energy is a vital part of our society, but producing it and using it come with heavy consequences. One way to provide for our energy needs that may be important in the near future is clean
coal technology. However, it can only become a reality with the support of the public. Unfortunately, coal technology often seems stagnant and outdated to the general public, placing the entire industry in an unfavorable position. Even if members of the public do provide support, they may wrongly think their support for clean coal technology eliminates the need for them to make other sacrifices, such as energy conservation.

To insure that public support comes to the aid of clean coal technology in a way that does not encourage energy irresponsibility, the research community must pursue informal education. Since informal education programs are designed to bring scientific and technical arguments to general audiences, they naturally produce boundary objects—artifacts that are informative in more than one social world (Star & Griesemer, 1989, p. 393). The websites discussed in this study, the Coal Energy Portal from the U.S. Department of Energy and Learnaboutcoal.org from Americans for Balanced Energy Choices, are boundary objects that provide informal education by taking scientific and technical arguments from field of clean coal energy and bringing them to the general public. Despite some mixed responses to engagement elements, these websites open the door for the public to understand parts of coal energy and coal energy research. Understanding them can provide a window about the ways in which the general public begins to get involved in scientific research.
REFERENCES


# Appendix A: Survey Questions and Data

**Americans For Balanced Energy Choices**

| Have you read and agreed to everything in the informed consent document? |
|-----------------------------|-----------------------------|
| yes                         | yes                         |
| yes                         | yes                         |
| yes                         | yes                         |
| yes                         | yes                         |
| yes                         | yes                         |
| yes                         | yes                         |

| Select the user code provided to you by the principal investigator. |
|-----------------------------|-----------------------------|
| ABEC                       | ABEC                       |
| ABEC                       | ABEC                       |
| ABEC                       | ABEC                       |
| ABEC                       | ABEC                       |
| ABEC                       | ABEC                       |

<table>
<thead>
<tr>
<th>What is your current primary academic major?</th>
</tr>
</thead>
<tbody>
<tr>
<td>chemical engineer</td>
</tr>
<tr>
<td>Computer Science</td>
</tr>
<tr>
<td>Electrical Engineering</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
</tr>
<tr>
<td>materials engineering</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What is your year in college?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
</tr>
<tr>
<td>1st</td>
</tr>
<tr>
<td>3rd</td>
</tr>
<tr>
<td>3rd</td>
</tr>
<tr>
<td>1st</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interest in energy technology. How interested are you in energy technology (such as coal and nuclear power plants, energy-saving appliances, alternative energy sources, or high-efficiency vehicles)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>very high</td>
</tr>
<tr>
<td>moderate</td>
</tr>
<tr>
<td>slight</td>
</tr>
<tr>
<td>very little</td>
</tr>
<tr>
<td>moderate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opinion about coal. Is your opinion of coal energy primarily positive or negative?</th>
</tr>
</thead>
<tbody>
<tr>
<td>negative</td>
</tr>
<tr>
<td>negative</td>
</tr>
<tr>
<td>negative</td>
</tr>
<tr>
<td>negative</td>
</tr>
<tr>
<td>negative</td>
</tr>
<tr>
<td>positive</td>
</tr>
<tr>
<td>positive</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Degree of opinion. How positive or negative is your opinion?</th>
</tr>
</thead>
<tbody>
<tr>
<td>very little</td>
</tr>
<tr>
<td>slight</td>
</tr>
<tr>
<td>slight</td>
</tr>
<tr>
<td>slight</td>
</tr>
<tr>
<td>very little</td>
</tr>
<tr>
<td>very little</td>
</tr>
<tr>
<td>very little</td>
</tr>
<tr>
<td>very little</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Support for coal research. Do you support or oppose government-funded research about coal energy?</th>
</tr>
</thead>
<tbody>
<tr>
<td>oppose</td>
</tr>
<tr>
<td>oppose</td>
</tr>
<tr>
<td>support</td>
</tr>
<tr>
<td>support</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Degree of support. How much do you support or oppose it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>slight</td>
</tr>
<tr>
<td>slight</td>
</tr>
<tr>
<td>slight</td>
</tr>
<tr>
<td>slight</td>
</tr>
<tr>
<td>very little</td>
</tr>
<tr>
<td>very little</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Familiarity with Americans for Balanced Energy Choices. How familiar are you with Americans for Balanced Energy Choices?</th>
</tr>
</thead>
<tbody>
<tr>
<td>very little</td>
</tr>
<tr>
<td>very little</td>
</tr>
<tr>
<td>very little</td>
</tr>
<tr>
<td>very little</td>
</tr>
<tr>
<td>very little</td>
</tr>
<tr>
<td>very little</td>
</tr>
<tr>
<td>very little</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opinion of Americans for Balanced Energy Choices. Before viewing the website, do you have a primarily positive or negative opinion about Americans for Balanced Energy Choices?</th>
</tr>
</thead>
<tbody>
<tr>
<td>positive</td>
</tr>
<tr>
<td>positive</td>
</tr>
<tr>
<td>positive</td>
</tr>
<tr>
<td>positive</td>
</tr>
<tr>
<td>positive</td>
</tr>
<tr>
<td>positive</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Degree of opinion. How positive or negative is your opinion of Americans for Balanced Energy Choices?</th>
</tr>
</thead>
<tbody>
<tr>
<td>very little</td>
</tr>
<tr>
<td>very little</td>
</tr>
<tr>
<td>very little</td>
</tr>
<tr>
<td>very little</td>
</tr>
<tr>
<td>very little</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Amount of motion. How much motion does this website use?</th>
</tr>
</thead>
<tbody>
<tr>
<td>moderate</td>
</tr>
<tr>
<td>moderate</td>
</tr>
<tr>
<td>moderate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Effect of amount of motion on user interest. Does the amount of motion on the website affect your interest in the site primarily positively or negatively?</th>
</tr>
</thead>
<tbody>
<tr>
<td>positively</td>
</tr>
<tr>
<td>positively</td>
</tr>
<tr>
<td>negatively</td>
</tr>
<tr>
<td>positively</td>
</tr>
<tr>
<td>positively</td>
</tr>
<tr>
<td>positively</td>
</tr>
<tr>
<td>positives</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Degree of effect. How positive or negative is the effect?</th>
</tr>
</thead>
<tbody>
<tr>
<td>very little</td>
</tr>
<tr>
<td>very little</td>
</tr>
<tr>
<td>slight</td>
</tr>
<tr>
<td>slight</td>
</tr>
<tr>
<td>slight</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Effect of amount of motion on user time. Does the amount of motion on the website affect your willingness to spend time on the site primarily positively or negatively?</th>
</tr>
</thead>
<tbody>
<tr>
<td>positively</td>
</tr>
<tr>
<td>positively</td>
</tr>
<tr>
<td>negatively</td>
</tr>
<tr>
<td>positively</td>
</tr>
<tr>
<td>positively</td>
</tr>
<tr>
<td>positively</td>
</tr>
<tr>
<td>positively</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Degree of effect. How positive or negative is the effect?</th>
</tr>
</thead>
<tbody>
<tr>
<td>very little</td>
</tr>
<tr>
<td>very little</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quality of motion. For the amount of motion that appears on this website, what is the quality (overall content and production quality) of the website’s motion?</th>
</tr>
</thead>
<tbody>
<tr>
<td>slight</td>
</tr>
<tr>
<td>moderate</td>
</tr>
<tr>
<td>moderate</td>
</tr>
<tr>
<td>slight</td>
</tr>
<tr>
<td>slight</td>
</tr>
<tr>
<td>moderate</td>
</tr>
</tbody>
</table>

| very high                                                   | slight                    |

| very high                                                   | very high                 |

<p>| very high                                                   | slight                    |</p>
<table>
<thead>
<tr>
<th>Effect of quality of motion on user interest. Does the quality of motion on the website affect your interest in the site primarily positively or negatively?</th>
</tr>
</thead>
<tbody>
<tr>
<td>positively</td>
</tr>
<tr>
<td>Degree of effect. How positive or negative is the effect?</td>
</tr>
<tr>
<td>slight</td>
</tr>
<tr>
<td>Effect of quality of motion on user time. Does the quality of motion on the website affect your willingness to spend time on the site primarily positively or negatively?</td>
</tr>
<tr>
<td>positively</td>
</tr>
<tr>
<td>Degree of effect. How positive or negative is the effect?</td>
</tr>
<tr>
<td>very little</td>
</tr>
<tr>
<td>Amount of sound. How much sound does this website use?</td>
</tr>
<tr>
<td>moderate</td>
</tr>
<tr>
<td>Effect of amount of sound on user interest. Does the amount of sound on the website affect your interest in the site primarily positively or negatively?</td>
</tr>
<tr>
<td>negatively</td>
</tr>
<tr>
<td>Degree of effect. How positive or negative is the effect?</td>
</tr>
<tr>
<td>moderate</td>
</tr>
<tr>
<td>Effect of amount of sound on user time. Does the amount of sound on the website affect your willingness to spend time on the site primarily positively or negatively?</td>
</tr>
<tr>
<td>negatively</td>
</tr>
<tr>
<td>Degree of effect. How positive or negative is the effect?</td>
</tr>
<tr>
<td>moderate</td>
</tr>
<tr>
<td>Quality of sound. For the amount of sound that appears on this website, what is the quality (overall content and production quality) of the website’s sound?</td>
</tr>
<tr>
<td>slight</td>
</tr>
<tr>
<td>Effect of quality of sound on user interest. Does the quality of sound on the website affect your interest in the site primarily positively or negatively?</td>
</tr>
<tr>
<td>positively</td>
</tr>
<tr>
<td>Degree of effect. How positive or negative is the effect?</td>
</tr>
<tr>
<td>moderate</td>
</tr>
<tr>
<td>Effect of quality of sound on user time. Does the quality of sound on the website affect your willingness to spend time on the site primarily positively or negatively?</td>
</tr>
<tr>
<td>negatively</td>
</tr>
<tr>
<td>Degree of effect. How positive or negative is the effect?</td>
</tr>
<tr>
<td>moderate</td>
</tr>
<tr>
<td>Amount of human personality. How much human personality does this website use?</td>
</tr>
<tr>
<td>very high</td>
</tr>
<tr>
<td>Effect of amount of human personality on user interest. Does the amount of human personality on the website affect your interest in the site primarily positively or negatively?</td>
</tr>
<tr>
<td>negatively</td>
</tr>
<tr>
<td>Degree of effect. How positive or negative is the effect?</td>
</tr>
<tr>
<td>moderate</td>
</tr>
<tr>
<td>Effect of amount of human personality on user time. Does the amount of human personality on the website affect your willingness to spend time on the site primarily positively or negatively?</td>
</tr>
<tr>
<td>negatively</td>
</tr>
</tbody>
</table>
Degree of effect. How positive or negative is the effect?

| Quality of human personality. For the amount of human personality that appears on this website, what is the quality (overall content and production quality) of the website’s human personality? |
|---|---|---|---|---|---|---|---|---|---|
| very high | moderate | slight | very high | slight | moderate | moderate | moderate | 0 | very high |
| Effect of quality of human personality on user interest. Does the quality of human personality on the website affect your interest in the site primarily positively or negatively? |
| negatively | positively | positively | positively | positively | positively | positively | positively | 0 | positively |

Effect of quality of human personality on user time. Does the quality of human personality on the website affect your willingness to spend time on the site primarily positively or negatively?

| Degree of effect. How positive or negative is the effect? |
|---|---|---|---|---|---|---|---|---|---|
| very high | slight | very little | slight | slight | very little | moderate | slight | 0 | slight |

Interest in energy technology. After viewing the Americans for Balanced Energy Choices website, how interested are you in energy technology (such as coal and nuclear power plants, energy-saving appliances, alternative energy sources, or high-efficiency vehicles)?

| very high | very high | moderate | moderate | moderate | slight | very high | moderate | 0 | moderate |

Opinion about coal. After viewing the Americans for Balanced Energy Choices website, is your opinion of coal energy primarily positive or negative?

| positive | positive | positive | positive | negative | positive | positive | positive | 0 | positive |

Degree of opinion. How positive or negative is your opinion?

| slight | very little | moderate | very little | very little | very little | very high | very little | 0 | slight |

Support for coal research. After viewing the Americans for Balanced Energy Choices website, do you primarily support or oppose government-funded research about coal energy?

| support | support | support | support | oppose | support | support | support | 0 | support |

Degree of support. How much do you support or oppose it?

| moderate | slight | moderate | very little | slight | very little | very high | moderate | 0 | moderate |

Familiarity with Americans for Balanced Energy Choices. After viewing the website, how familiar are you with Americans for Balanced Energy Choices?

| moderate | slight | moderate | slight | slight | slight | moderate | slight | 0 | slight |

Opinion of Americans for Balanced Energy Choices. After viewing the website, do you have a primarily positive or negative opinion about Americans for Balanced Energy Choices?

| positive | positive | positive | positive | negative | positive | positive | positive | 0 | positive |

Degree of opinion. How positive or negative is your opinion of Americans for Balanced Energy Choices?

| slight | slight | moderate | very little | slight | very little | moderate | slight | 0 | moderate |

Department of Energy

Have you read and agreed to everything in the informed consent document?

| yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |

Select the user code provided to you by the principal investigator.

| DOE | DOE | DOE | DOE | DOE | DOE | DOE | DOE | DOE | DOE |

What is your current primary academic major?

| Computer Science | Aerospace Engineering | Biochemistry | Genetics | Sociology | Dietetics | Chemical Engineering | 0 | Materials Engineering | Graphic Design |

What is your year in college?
<table>
<thead>
<tr>
<th>1st</th>
<th>1st</th>
<th>1st</th>
<th>2nd</th>
<th>4th</th>
<th>1st</th>
<th>3rd</th>
<th>4th</th>
<th>1st</th>
<th>1st</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interest in energy technology. How interested are you in energy technology (such as coal and nuclear power plants, energy-saving appliances, alternative energy sources, or high-efficiency vehicles)?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>slight</td>
<td>very high</td>
<td>very high</td>
<td>moderate</td>
<td>moderate</td>
<td>slight</td>
<td>moderate</td>
<td>very high</td>
<td>moderate</td>
<td>moderate</td>
</tr>
<tr>
<td><strong>Opinion about coal. Is your opinion of coal energy primarily positive or negative?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>positive</td>
<td>negative</td>
<td>negative</td>
<td>negative</td>
<td>positive</td>
<td>negative</td>
<td>negative</td>
<td>positive</td>
<td>negative</td>
<td>negative</td>
</tr>
<tr>
<td><strong>Degree of opinion. How positive or negative is your opinion?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>slight</td>
<td>slight</td>
<td>slight</td>
<td>slight</td>
<td>slight</td>
<td>slight</td>
<td>slight</td>
<td>moderate</td>
<td>moderate</td>
<td>slight</td>
</tr>
<tr>
<td><strong>Support for coal research. Do you support or oppose government-funded research about coal energy?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>support</td>
<td>support</td>
<td>support</td>
<td>support</td>
<td>support</td>
<td>oppose</td>
<td>support</td>
<td>support</td>
<td>support</td>
<td>support</td>
</tr>
<tr>
<td><strong>Degree of support. How much do you support or oppose it?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>very little</td>
<td>moderate</td>
<td>slight</td>
<td>moderate</td>
<td>slight</td>
<td>very little</td>
<td>slight</td>
<td>moderate</td>
<td>moderate</td>
<td>very little</td>
</tr>
<tr>
<td><strong>Familiarity with the Department of Energy. How familiar are you with the Department of Energy?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>slight</td>
<td>slight</td>
<td>very little</td>
<td>moderate</td>
<td>very little</td>
<td>very little</td>
<td>moderate</td>
<td>very little</td>
<td>slight</td>
<td>very little</td>
</tr>
<tr>
<td><strong>Opinion of the Department of Energy. Before viewing the website, do you have a primarily positive or negative opinion about the Department of Energy?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>positive</td>
<td>positive</td>
<td>positive</td>
<td>positive</td>
<td>positive</td>
<td>positive</td>
<td>positive</td>
<td>positive</td>
<td>positive</td>
<td>positive</td>
</tr>
<tr>
<td><strong>Degree of opinion. How positive or negative is your opinion of the Department of Energy?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>slight</td>
<td>slight</td>
<td>moderate</td>
<td>slight</td>
<td>very little</td>
<td>slight</td>
<td>slight</td>
<td>moderate</td>
<td>moderate</td>
<td>moderate</td>
</tr>
<tr>
<td><strong>Amount of motion. How much motion does this website use?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>very little</td>
<td>very little</td>
<td>very little</td>
<td>very little</td>
<td>very little</td>
<td>very little</td>
<td>very little</td>
<td>slight</td>
<td>very little</td>
<td>very little</td>
</tr>
<tr>
<td><strong>Effect of amount of motion on user interest. Does the amount of motion on the website affect your interest in the site primarily positively or negatively?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>negatively</td>
<td>negatively</td>
<td>positively</td>
<td>negatively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>negatively</td>
</tr>
<tr>
<td><strong>Degree of effect. How positive or negative is the effect?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>slight</td>
<td>very little</td>
<td>slight</td>
<td>slight</td>
<td>slight</td>
<td>slight</td>
<td>slight</td>
<td>very little</td>
<td>slight</td>
<td>very little</td>
</tr>
<tr>
<td><strong>Effect of amount of motion on user time. Does the amount of motion on the website affect your willingness to spend time on the site primarily positively or negatively?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>negatively</td>
<td>negatively</td>
<td>positively</td>
<td>negatively</td>
<td>positively</td>
<td>negatively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>negatively</td>
</tr>
<tr>
<td><strong>Degree of effect. How positive or negative is the effect?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>moderate</td>
<td>very little</td>
<td>moderate</td>
<td>moderate</td>
<td>very little</td>
<td>moderate</td>
<td>slight</td>
<td>very little</td>
<td>slight</td>
<td>very little</td>
</tr>
<tr>
<td><strong>Quality of motion. For the amount of motion that appears on this website, what is the quality (overall content and production quality) of the website’s motion?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>moderate</td>
<td>very high</td>
<td>moderate</td>
<td>moderate</td>
<td>very high</td>
<td>very little</td>
<td>moderate</td>
<td>moderate</td>
<td>moderate</td>
<td>0</td>
</tr>
<tr>
<td><strong>Effect of quality of motion on user interest. Does the quality of motion on the website affect your interest in the site primarily positively or negatively?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>0</td>
</tr>
<tr>
<td><strong>Degree of effect. How positive or negative is the effect?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>slight</td>
<td>slight</td>
<td>very little</td>
<td>moderate</td>
<td>moderate</td>
<td>moderate</td>
<td>slight</td>
<td>very little</td>
<td>slight</td>
<td>0</td>
</tr>
<tr>
<td><strong>Effect of quality of motion on user time. Does the quality of motion on the website affect your willingness to spend time on the site primarily positively or negatively?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>0</td>
</tr>
<tr>
<td><strong>Degree of effect. How positive or negative is the effect?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>moderate</td>
<td>moderate</td>
<td>slight</td>
<td>moderate</td>
<td>very little</td>
<td>moderate</td>
<td>slight</td>
<td>very little</td>
<td>moderate</td>
<td>0</td>
</tr>
<tr>
<td><strong>Amount of sound. How much sound does this website use?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effect of amount of sound on user interest. Does the amount of sound on the website affect your interest in the site primarily positively or negatively?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>negatively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
</tr>
<tr>
<td>Degree of effect. How positive or negative is the effect?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>slight</td>
<td>very little</td>
<td>very little</td>
<td>slight</td>
<td>very high</td>
<td>slight</td>
<td>slight</td>
<td>very little</td>
<td>moderate</td>
<td>moderate</td>
</tr>
<tr>
<td>Effect of amount of sound on user time. Does the amount of sound on the website affect your willingness to spend time on the site primarily positively or negatively?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>negatively</td>
<td>negatively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
</tr>
<tr>
<td>Degree of effect. How positive or negative is the effect?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>slight</td>
<td>very little</td>
<td>moderate</td>
<td>very little</td>
<td>moderate</td>
<td>slight</td>
<td>moderate</td>
<td>slight</td>
<td>very little</td>
<td>moderate</td>
</tr>
<tr>
<td>Quality of sound. For the amount of sound that appears on this website, what is the quality (overall content and production quality) of the website’s sound?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>moderate</td>
<td>moderate</td>
<td>slight</td>
<td>moderate</td>
<td>moderate</td>
<td>very high</td>
<td>moderate</td>
<td>slight</td>
<td>moderate</td>
<td>0</td>
</tr>
<tr>
<td>Effect of quality of sound on user interest. Does the quality of sound on the website affect your interest in the site primarily positively or negatively?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
</tr>
<tr>
<td>Degree of effect. How positive or negative is the effect?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>slight</td>
<td>slight</td>
<td>very little</td>
<td>moderate</td>
<td>moderate</td>
<td>moderate</td>
<td>slight</td>
<td>very little</td>
<td>moderate</td>
<td>0</td>
</tr>
<tr>
<td>Effect of quality of sound on user time. Does the quality of sound on the website affect your willingness to spend time on the site primarily positively or negatively?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
</tr>
<tr>
<td>Degree of effect. How positive or negative is the effect?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>slight</td>
<td>very little</td>
<td>very little</td>
<td>moderate</td>
<td>very high</td>
<td>slight</td>
<td>slight</td>
<td>very little</td>
<td>very high</td>
<td>0</td>
</tr>
<tr>
<td>Amount of human personality. How much human personality does this website use?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>slight</td>
<td>moderate</td>
<td>very little</td>
<td>slight</td>
<td>moderate</td>
<td>slight</td>
<td>moderate</td>
<td>slight</td>
<td>slight</td>
<td>slight</td>
</tr>
<tr>
<td>Effect of amount of human personality on user interest. Does the amount of human personality on the website affect your interest in the site primarily positively or negatively?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>positively</td>
<td>positively</td>
<td>negatively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
</tr>
<tr>
<td>Degree of effect. How positive or negative is the effect?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>slight</td>
<td>moderate</td>
<td>very little</td>
<td>moderate</td>
<td>very little</td>
<td>0</td>
<td>moderate</td>
<td>slight</td>
<td>very high</td>
<td>moderate</td>
</tr>
<tr>
<td>Effect of amount of human personality on user time. Does the amount of human personality on the website affect your willingness to spend time on the site primarily positively or negatively?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>positively</td>
<td>positively</td>
<td>negatively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
</tr>
<tr>
<td>Degree of effect. How positive or negative is the effect?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>slight</td>
<td>moderate</td>
<td>slight</td>
<td>very high</td>
<td>moderate</td>
<td>moderate</td>
<td>slight</td>
<td>slight</td>
<td>slight</td>
<td>slight</td>
</tr>
<tr>
<td>Quality of human personality. For the amount of human personality that appears on this website, what is the quality (overall content and production quality) of the website’s human personality?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>slight</td>
<td>very high</td>
<td>very little</td>
<td>moderate</td>
<td>moderate</td>
<td>moderate</td>
<td>moderate</td>
<td>slight</td>
<td>moderate</td>
<td>slight</td>
</tr>
<tr>
<td>Effect of quality of human personality on user interest. Does the quality of human personality on the website affect your interest in the site primarily positively or negatively?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>negatively</td>
<td>positively</td>
<td>negatively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
</tr>
<tr>
<td>Degree of effect. How positive or negative is the effect?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>very little</td>
<td>moderate</td>
<td>very little</td>
<td>moderate</td>
<td>very little</td>
<td>slight</td>
<td>moderate</td>
<td>slight</td>
<td>moderate</td>
<td>slight</td>
</tr>
<tr>
<td>negatively</td>
<td>positively</td>
<td>negatively</td>
<td>positively</td>
<td>negatively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
<td>positively</td>
</tr>
<tr>
<td>------------</td>
<td>------------</td>
<td>------------</td>
<td>------------</td>
<td>------------</td>
<td>------------</td>
<td>------------</td>
<td>------------</td>
<td>------------</td>
<td>------------</td>
</tr>
</tbody>
</table>

**Degree of effect. How positive or negative is the effect?**

<table>
<thead>
<tr>
<th>very little</th>
<th>very high</th>
<th>very little</th>
<th>very high</th>
<th>slight</th>
<th>moderate</th>
<th>moderate</th>
<th>slight</th>
<th>moderate</th>
<th>slight</th>
</tr>
</thead>
</table>

**Interest in energy technology. After viewing the Department of Energy website, how interested are you in energy technology (such as coal and nuclear power plants, energy-saving appliances, alternative energy sources, or high-efficiency vehicles)?**

<table>
<thead>
<tr>
<th>slight</th>
<th>very high</th>
<th>moderate</th>
<th>moderate</th>
<th>moderate</th>
<th>moderate</th>
<th>very high</th>
<th>very high</th>
<th>moderate</th>
<th>slight</th>
</tr>
</thead>
</table>

**Opinion about coal. After viewing the Department of Energy website, is your opinion of coal energy primarily positive or negative?**

<table>
<thead>
<tr>
<th>positive</th>
<th>positive</th>
<th>positive</th>
<th>positive</th>
<th>positive</th>
<th>positive</th>
<th>positive</th>
<th>positive</th>
<th>negative</th>
<th>negative</th>
</tr>
</thead>
</table>

**Degree of opinion. How positive or negative is your opinion?**

<table>
<thead>
<tr>
<th>slight</th>
<th>moderate</th>
<th>very high</th>
<th>slight</th>
<th>very little</th>
<th>moderate</th>
<th>moderate</th>
<th>moderate</th>
<th>slight</th>
<th>very little</th>
</tr>
</thead>
</table>

**Support for coal research. After viewing the Department of Energy website, do you primarily support or oppose government-funded research about coal energy?**

<table>
<thead>
<tr>
<th>support</th>
<th>support</th>
<th>support</th>
<th>support</th>
<th>support</th>
<th>support</th>
<th>support</th>
<th>support</th>
<th>support</th>
<th>support</th>
</tr>
</thead>
</table>

**Degree of support. How much do you support or oppose it?**

<table>
<thead>
<tr>
<th>slight</th>
<th>very high</th>
<th>moderate</th>
<th>moderate</th>
<th>slight</th>
<th>moderate</th>
<th>moderate</th>
<th>moderate</th>
<th>moderate</th>
<th>moderate</th>
</tr>
</thead>
</table>

**Familiarity with the Department of Energy. After viewing the Department of Energy website, how familiar are you with the Department of Energy?**

<table>
<thead>
<tr>
<th>slight</th>
<th>moderate</th>
<th>slight</th>
<th>slight</th>
<th>moderate</th>
<th>moderate</th>
<th>moderate</th>
<th>moderate</th>
<th>moderate</th>
<th>very little</th>
</tr>
</thead>
</table>

**Opinion of the Department of Energy. After viewing the website, do you now have a primarily positive or negative opinion about the Department of Energy?**

<table>
<thead>
<tr>
<th>positive</th>
<th>positive</th>
<th>positive</th>
<th>positive</th>
<th>positive</th>
<th>positive</th>
<th>positive</th>
<th>positive</th>
<th>positive</th>
<th>positive</th>
</tr>
</thead>
</table>

**Degree of opinion. How positive or negative is your opinion of the Department of Energy?**

| moderate | very high | moderate | moderate | slight | moderate | moderate | moderate | moderate | slight |
APPENDIX B: INTERVIEW TRANSCRIPTS

Appendix B: Transcript Conventions
The following conventions were used to transcribe the data used in this paper.
, indicates a phrasal pause
. indicates a sentence final intonation
.. indicates a short pause
…… indicates a longer pause, with the number of dots representative of pause length.
(A xx ) indicate backchannelling and overlaps.
(description) indicates a situational description or paralinguistic communication
= indicates a latch

Appendix B: Interview 1
Speaker A: Interviewer
Speaker B1: Study Participant 1
“Speaker” C: Website Spokesperson
Topic: Speaker’s response to multimedia & agent-based engagement strategies on Learnaboutcoal.org
Duration: Approx. 20 min

1    A    Ok. This will be recorded but will remain confidential for the
duration of all of its lifetime, as we’ve just discussed and you’ve
already seen the informed consent document, and I have that and
I’ll keep that on record. I do have a copy for you, so, what I
would like to do is I have a copy of your responses to the survey
and what we are going to do is we are going to kind of go through
it a little bit and I am going to specifically ask about why you
answered the way that you did, you know what about your experience
led you to these answers and we can look at these so you can
remember what was going on. Now the first section was about your
original opinion on all sorts of things, so if you could, could you
talk about what you already knew about coal, coal energy, or energy
in general, and also about clean coal energy prior to using the
website.
15    B1    I hadn’t heard much about clean coal in particular, but coal in and
of itself is still a nonrenewable resource and I was biased towards
more renewable resources like solar energy or wind power because
eventually this coal will run out again, this isn’t solving the
problem it is just prolong it for a few years my initial response
was not high, I’m not overly fond of coal to begin with
A  Right, and that is very typical. That’s not unusual at all...so it
says here that you oppose this energy research into coal a-and it
doesn’t seem you have that strong a uh that strong an opinion one
way or the other...I guess the question is about...uhm ..did
you...you oppose coal research in the future and you you you said
it was a slight. Did you know about coal research that was going on
at all?
B1  I was unaware of any extensive res...research going into coal. I
figured money would be better spent in other...fields...to come up
with a long term solution rather than putting off the problem for
twenty, thirty more years.
A  So it sounds like you definitely knew a lot of things and like you
had some prior opinions about energy in general ...the energy
plight
B1  Absolutely
A  Before, before looking at this website what do you think about coal
ah in terms of its environmental impact
B1  I was aware of all the, stereotypes I suppose, its dirty, it
requires digging into the earth, uhm, people have to go mine for
it, of course the...the deaths that happened in the mines (mmmmmm)
it has not very good connotations throughout the world at the
moment (right) quite a few people don't think highly of it, myself
being one of them I suppose
A  Mmhm, sure. sure...have you, have you ever heard of uh Americans
for balanced energy choices before, or had you ever seen uhm this
website or any of the commercials related to it before?
B1  Not a clue
A  Ok. So based on, you know, based on that, that’s not, that’s not
particularly surprising, your opinion about the entity that created
this website was pretty neutral. But I want to specifically talk
about your experience when you got to this website and just as kind
of a reminder I’ll play the intro again
C  (recording)Hey, you found it (A: Now) Great. I’m Danielle.
(inaudible)I maybe a kid, but we’re a lot a like. (inaudible)We
both want affordable, reliable energy
C  [and a clean environment. Well, luckily, we can have our cake, and
eat it too.]
A  [so what, what was your first reaction when you came to this
website and this started happening]
C  Today, over half of america’s electricity comes from. (recording
stops)
B1  As far as websites trying to get an opinion across this one was one
of the more...extensive I’ve seen maybe, I don’t know that I’ve
seen any video as well produced and placed into a website as this
girl here
A  mhm
B1 I was very impressed by the technological aspects behind it, but
then again, I’m very aware that anyone can produce a website or a
brochure or a flier to make themselves look good
A so, did you, were you wary of the authority that this website
presented?
B1 absolutely
A uhm, ah. What ah, what about the website, hehe, made you suspect a
little bit that it may not be the most credible source
B1 the fact that its designed by the, what’s the companies name,
Americans for good energy choices
A right
B1 a group of people who want to keep their coal companies going,
they’re going to say, buy out whoever they can to keep their
companies in business
A mhm, mhm. So specifically the use of multimedia, you said that
compared to other websites that you’ve seen this is... a... high
quality? Use of multimedia?
B1 just about any other video you see on the internet you’re going
have a standard 640 by 480 block of you square video and everything
this block is going to be video but this is well... cut into the
page theres no difference in background between the rest of the
page and this video here. (mhm) it looks very nice.
A ok.
B1 it definitely makes, puts a very favorable opinion (inaudible...)
design=
A =what about. Uhm. So the. We know that the quality is here, and we
also, what did you think about... the, the amount of motion that’s
here, what, the, the motion and the, and the sound. is this, you
know, for, for other websites that you might expect to see similar
information on, was this was this a lot of motion, or was this
relatively little?
B1 oh I think they’re going for about as much emotion as you can get
(mmmhmm) a little black girl sitting in a pink chair. Its about as
sappy as you can get, talking about coal.
A so lets talk about the girl in the hehe, chair. What did you think
of her, what was your reaction to her?
B1 =she knows nothing about coal. She is reading a speech. (mmmm)
and probably getting paid fairly well to do so. Perhaps a daughter
of on of the rich people whose creating this website (mhm). But
she herself has no preconceived notions or any desires to extend
the uses of coal to the next two hundred and fifty years.
A so, you, you questioned how much she really knows and really cares
about the actual research
B1 oh yes
A ok. Why do you think that the people who made this website chose to
use her?
B1 ...if you were going to pick the most...unobtrusive, most credible,
most credible source you wouldn’t pick an old rich white guy or a
politician. They’re one and the same. You pick a a small, a small
girl who has never told a lie. In her life before, and she’s you
could see her sitting in her room here in her nice comfy chair
here, not disturbing a soul, just telling it as she see’s it...she
believes this to be the truth and wants to share it with people
A mmmm...ok...lets see....looking specifically at the the answers
that you gave, one of the things that I, we specifically asked was
about human personality, and um, did you...did you see a lot of
human personality on the website, and, however however, how did you,
what did you uhm, when I asked you about human personality, what
did you, um, interpret that to mean, what specifically did you
think that, what what did you see that’s up here that might fit
that?
B1 ...if you’re trying to gauge the human personality of some source,
it can be somewhere in the spectrum between....machine... which
would be just your basic text based website, or something much more
advanced like this website in this browser window appears almost
like a, another human speaking to you (mhmm) and this came much
closer than most websites in existence today, because it has this
nice video, and this girl talking directly to you
A and how did you, how did you react um, your answers here for the
survey, I mean, we can take a look, ah, and I’m looking at (sigh)
you know I asked you about human personality, the the quality of
it, uh the amount of it, and then your reaction to it. I, what I’m
sensing is that you were impressed with the quality of it, you you
though that wow this is a really well done thing (absolutely) this
this person is, this site has a lot of human-ness to it. How, how
did affect, or, how did that affect or change your opinion about
what the site talks about, the coal energy?
B1 ...it made me want to give it more of a chance than any related
coal-based energy website with thousands and thousands of sources
that could be used to check out the status of coal energy in
America today, this one certainly stands out, and if your going to
choose one this little girl would certainly make you want to stick
around and read this site, at least a little bit longer than a
standard text based html page
A so that, so the, by having her there and by having it motion, sound
and personality, the way that it was done here... made it easier for you to spend time on the site, made it easier, you you, you know, it kind of sucked you in more than one that maybe was just text

B1 yes

A ok. I’m gonna change this screen a little bit to look at, uh... wait.. this one. This is the website where its specifically talking about, uhm, clean coal research... did you, did you get to spend much time on this part of the web

B1 I thought, it was the, the opening page and then one other page that we were supposed to look at, was that, wa=

A yeah this is the second. Do you remember it at all?

B1 I don’t remember seeing this girl at all

A well lets take a look......promise of the future, this one maybe?

Does this one look familiar?

B1 yes

A ok

B1 yeah

A what do you think about this page? This is the one that’s got, what can you, can you describe it?

B1 significantly less technologically advanced than the opening page. They seemed to put most of their effort in the little girl speaking directly to you (mhmm) and the rest is, their various statistics and whatnot that they can throw on there to make themselves look good

A right

B1 a nice computer rendered image. Nothing extraordinary here

A mhm. So in terms of multimedia features, in terms of human personality this is more similar to, umh, kind of what you just might see on an average website=

B1 =this is more mainstream. This is no longer the cutting edge (right) (inaudible)

A well how does it, how does it stack up compared to other ones, I mean, having had, having had a chance to read through it, and we can refresh your memory a little bit more, but they are talking, they are talking here about, uhm, advances in the technology, a roadmap for the ultra clean coal plants of the twenty first century, example of progress, futuregen, do you remember them talking about futurgen (mhmm) how they’re going to create a zero, um, a zero emissions power plant. What did you think about the material that was coming here, how, how, did you think that, I guess what do you think of it, what do you think of what you see?

B1 I don’t know that I saw the link to futuregen here,

A right
I don’t see a lot of statistics to back this up, I am not totally sure that zero emissions is completely possible, there’s got to be some unstated qualifier here in that statement. Right. So you were suspect of whether they were giving you all the information.

I don’t think anyone is going to give you all of the information, but they weren’t going out of their way to... to fully support their claims here.

mhmm, sure. It looks nice, but beyond that if you were avidly seeking out statistics and pure facts about the research that is being made towards clean coal in the future.

mhmm.

they’re not providing all the information you’d want to find so based on what is here, who do you think they were trying to get after, who do you think their real audience is?

it would be the common American who will take this at face value and run with it.

and do you, do you fit into that group, er, how well do. How well do the arguments they are making here work for you?

being in a hard science major, I, I don’t think I’m the common American. I tend to look for statistics or scientific basis to back this up.

ok. I think that we have a pretty good understanding of what you thought of the multimedia features. I would like to specifically look at how this affected your new position. Uhm. .... after this, your answers are suggests... I I went back and I asked again all the questions about (mhmm) coal energy, coal energy technology, how interested are you, we don’t see a lot of change there because you were pretty interested to start (right) with, uhm. Looking at your opinion about coal compared to uhm, previously, you know, it stayed negative but you answered moderate here so, it was a two the way that I had coded it, and it became a one, so your opinion slightly increased (ok) is that fair?

um, I don’t remember exactly what I said in the beginning, but seeing that some scientific research is being made toward cleaning up coal rather than keeping it as the old nasty dirty processes of the past is a step in the right direction I suppose.

mhmm.

Who funded this group,. its just a name right now (right) I don’t see any names or pictures or what companies they run.
A mhmm. How did that affect your opinion of the site and your opinion of the technology?

B1 ...not in a...beneficial manner towards them. There’s still hiding behind a. not hiding but they’re still, they are hidden behind this website of theirs.

A mhmm

B1 maybe if I had looked their About us again more I could have seen some of the pictures of faces of people who are behind it

A sure

B1 but I imagine that it would be the rich white guys who want to keep their coal companies running

A mhmm.... Just out of curiosity, after the study did you go back and look at more of it? Heheh

B1 I did not. I looked at the... what was that other website?

A Department of .....how

B1 so you walked across the hall and found out what other people were looking at

B1 wasn’t it the, wasn’t there a link to the second website on that survey?

A really?

B1 on the website. We had the choice of going to ABCE or the second one I want to say was D

A department of energy. D o e. did you. So you went in and did you just look at it

B1 I filled out the survey and then afterwards I went back to the website and it said go on to link for abce, go on to the link for department of energy

A ok. did you, did you do the whole survey again or did you just look at it?

B1 I just looked at it (cool) after doing the survey

A cool. Well what did you think of the department of energy, since we have the information?

B1 slightly more credibly, more in the nation’s interest (mhmm) I suppose...

A interesting. Interesting....ok... is there s, ex, that especially struck you or stuck out at you about this, I mean we’ve heard a lot about, kind of the tactics they’re taking here and kind of how you react... is there anything that you noticed that was prominent that you would like to talk about?

B1 I don’t like those those scroll button arrows

A ok....ok

B1 I prefer the general big long scroll bar instead of being forced to go down to a tiny area on the screen

A mhmm. What about the multimedia features themselves. We can go back
to the homepage. Um. ... ... were. you were, you were happy with
the technology, you were impressed by that and that made the site
more appealing...um...did... uh. What about the content of the
data. What about the, you know we talk about a little bit before,
how you weren’t necessary as trusting or you didn’t think this was
a credible a source because you didn’t trust the person that was
talking. How well did, did, I guess maybe the question, a good
question to ask would be how would you, I mean, what would you have
preferred to see? Now I know its hard to think about that ,
but.....

B1 I don’t think there is any harm in having a nice pretty little girl
here telling you about what is being done with coal, but then to
really back up their claims it’d be nice to have some, not
politician, but some scientists, although its hard to gauge a
scientists credibility either, its always more credible than a
twelve year old girl sitting in her pink chair taking about exactly
what steps are being done rather than we are taking steps to make
this better. What are those steps, how are you doing this, what
kind of plan do you have, why is this better, more specifics.
Acso, in general, for you , more information would have been, more
information more detailed information would have been more
persuasive than, uhm, the high quality production of the site
B1 yes.. more detailed.

A ......well I think that that gives me a lot of information I , uhm,
I do have any , real further questions, umh. If you have any
thoughts or ideas about this website, about the technology in
general, do you uhmm....do you think clean coal energy, the way
they are describing it here, is feasible, is it something that’s
interesting to you, or, uhm

B1 interesting, yes. And I can see it taking off in maybe the next ten
years, because right now solar energy isn’t efficient enough to
become mainstream. So this may be a step we have to take just to
get through the next twenty, thirty years just until something else
becomes viable.

A ok.

B1 one thing that really struck me was that third one up there that
says ive become more ecofriendly, but its ok if your not. They
certainly don’t want to offend anyone.

A we could talk about that blog that they’ve got for hours. I, did
you take a look inside the blog at all or did you read the comments
here?

B1 I read the comments here, I don’t think I clicked on the comments
further.

A that’s, it’s a riot. The, the back and forth on there is pretty fun
to read. What, ah, what um, gosh, I was, I had another quick question that I was curious about...........hmm......it was a really good one, and I don’t remember what it was. Its driving me crazy...

uhm, what were we just talking about. We were talking about more detailed information

A more detailed information site quality is high but that’s not as big a deal for you as more information would have been. This kind of stuff might be a half step. Uh.....gosh I don’t know...I think that’s all the question I have for you right now, and this has, this has been. Oh yeah, another good question. When you, when you were working with this site, what was your impression of... I was purposefully trying to be as open ended as possible so that the that you would define for yourself what you were supposed to do with this information, uhm... what did you feel like your task was, what were you trying to do when you came to this

B1 to see how much of an impact this website had on my perception of
coal, or foal

A mmmm

B1 ...I assume the other website that I hadn’t seen until after I filled out the survey. ..would present the same information, but , perhaps not take such a positive stance on what should be done, and it could be in the (inaudible) energy future

A ok....alright. thank you very much, I’m going to close this down.
Appendix B: Interview 2

Speaker A: Interviewer
Speaker B2: Study Participant 2
“Speaker” C: Website Spokesperson

Topic: Speaker’s response to multimedia & agent-based engagement strategies on Learnaboutcoal.org

Duration: Approx. 20 min

1  A  ok. so. the cameras and the recorders are all on, and we can go
2  ahead and begin. as we’ve already talked about in the informed
3  consent document, ah, everything that you say here, at least with
4  regards to your identity will be kept confidential, the data you
5  give will be, will be used, for, research purposes only, and, ah,
6  at the conclusion of this study will remain in the possession of
7  the principle investigator. ah. in the invent that your information
8  is used for anything that’s published or put in the public in any
9  way, your identity will be protected...ah...confi, it will be kept
10  confidential, and so on. ok.. so, I want to go ahead and begin, if
11  you remember, this is this is the website that you looked at
12  before, correct?
13  B2  ...um....it looks similar, but I remember, there was a little girl
14  on the front.
15  A  mkay...the little, yeah, the little girl, its kind of random
16  whether the boy or the girl comes up. right
17  B2  =yeah, pretty much, the same
18  A  and, I’ve already asked you to do the survey and I have your survey
19  answers, here, um. and I asked you to reflect about a number of
20  different things about the website and how, u you reacted to the
21  website. and what I want to do during, about the next twenty
22  minutes or so is.. get a little bit more, information about why you
23  reacted the way that you did, so, um I would like to start of with
24  kind of your interest, your attitudes, your opinions, um about,
25  coal energy research or energy in general prior to using this
26  website.
27  B2  um, my main reason for going into chemical engineering is that, um,
28  I want to research alternative forms of energy, ah. I learned some
29  about hydrogen fuel cells in high school, and I thought that that
30  was really, I really like that idea, and so from, once I came in
31  here thinking that I just wanted to do work with the hydrogen fuel
32  cells and now that I’m here, im thinking theres a lot more forms of
33  alternative energy that I didn’t realize before
34  A  =mhmm.
35  B2  and, even uh, pretty much, anything that’s not oil, because,
36  uh..., I realize that a lot of our involvement in the middle east
has to do with our dependence on the oil.

A mkay..so, you would say that, probably a bigger concern for you, is, ...independence from foreign oil, foreign energy, more so than global climate change, for example.

B2 immediately, yeah.

A immediately, ok. ah. specifically, what did you know about coal and coal energy, or or what were your opinions about coal and coal energy before you you used the website?

B2 well, I knew, you know, we use coal power plants to produce electricity. you burn the coal to heat up water to drive steam turbines. for the most part. and ah, you know there’s, I know there’s definite emissions that you know, came out of this, that adversely affect the environment, but, it, it works (A mhmm), you know, we need the electricity, so...it becomes, some costs, theres, theres not much we can do about it, except for, ah, that’s why, I was really impressed, when I read this, that the uh, their trying to get to a zero-emissions

A mhmm

B2 I thought that was really..interesting.

A ...ok...um, so prior to viewing the website, you , um, I asked about, your, your opinion of coal, and you before had said that you had a negative opinion of coal energy, but it was, it was, the lowest, the lowest, answer I could, I could let you, I cou, I let you give. so it only.

B2 =it was negative, but not very negative. (A mhmm) like, I want something better, but...

A sure, sure. and, it was pretty similar for your, um, support, or support for coal energy, I asked you how much you support or oppose it, and you said you oppose it, but to a slightly more degree.

B2 cuz I didn’t really see it going anywhere.

A mkay

B2 I saw, at the time, before seeing this stuff, you know, well, coal is, you know, something in the past. we’re moving on, where gonna find, better, things.

A sure. k.. um.. what about, the Americans for balanced energy choices, the group that publishes this website, did you know anything about them previously? or

B2 no.

A no. ah, and then, from...how did, how did that affect, kind of, you relationship to the website?...when you came.

B2 =well I, came into it cold, I had no idea what I was getting into, so...

A mhmm..so..it didn’t, so you didn’t really have any preformed opinions
yeah, no.

other than the fact that I think alternative energy is a good idea.

ok. great, ok. so, when, you came into the website, and started looking specifically at the website, um, what did you think of it when you first came to it, what was your initial reaction?

um...when that person starts talking to you, its very, that just grabbed my attention, and, I don’t know, I didn’t like that. it seems..strange.

what about the, what about the person seems strange?

well, just, uh, ...I don’t know I guess, that they have a kid talking to you because a lot of the thinking about alternative energy comes from the fact that we want to be thinking about our future, and you know, I guess having a kid talk to you is a good way to get to think about, maybe, trying to get you to think about the future, but..at the same time, you could tell that, the kid was, you know, kind of mechanical, that she was just definitely reciting lines that she had been given. I felt like I was watching something on sesame street

so, you felt like, you felt like the, um, you felt like you weren’t really being invoked as the target audience

oversimplified, sort of I don’t know.

oversimplified, ok....what was your, your impression of.. what was your impression of multimedia features in general, um, how much, you know compared to other websites that you see, how much multimedia do you see on this website?

multimedia being all sorts of video, sound, and just sort of visual things in general?

ok, so, um,

oversimplified, sort of I don’t know.

what was your, your impression of multimedia features in general, um, how much, you know compared to other websites that you see, how much multimedia do you see on this website?

multimedia being all sorts of video, sound, and just sort of visual things in general?

...i kind of like the, ah the tool bar, at the top, how that, you know, theres a little visual thing that goes across with that, which, something like a sun, or like the little yellow disk that was, kinda cool

mhm.

you know, for the fact that I didn’t like the, the, just the fact that as soon as you open up a website, when you don’t know what your getting into and your just being talked at immediately, it almost feels like a commercial.

mhm

it almost feels like your trying to be sold something, right off the bat, without even, without any. (A yeah) preparation for it, I guess
A: ok, and, so, there was a lot of things about the video portion, that you didn’t like. what did you think of, of its quality as a piece of multimedia? as as something that was produced.

B2: hmm...well....i mean, it didn’t..i guess it wasn’t, bad, you, for, if it was just for the sake of being a video, I mean, you know, theres, the little girl, was animated, she was moving around, she was.....i realize that, you know, part of your, survey, asked about ,you know, personalizing the website....and, yeah, I don’t know that she really accomplished that goal.

A: mkay. do you want to talk about, um, about the human personality, the spokesperson herself, or himself? or, theres actually several on the site

B2: like I said, there didn’t seem to be much personality, cuz, it seemed like, she was just reciting, lines that had been given to her, she, the impression that I got was, ok, here’s a child, she is an actor, she’s been told, to, talk like this and be like this and she’s doing that cause that’s what she’s good at

A: mhmm.

B2: not exactly, you know, it doesn’t come off that you know she really, this is someone who really thinks like this is someone who has, you know, an intimate involvement in the company, or in anything.

A: right.

B2 =she just seems like an outsider pulled in, cuz, I don’t know, she’ll get people’s attention probably

A =so, can you talk a little about...you didn’t like the videos really, the way that they were used, and the content, the things that they were saying, ah, theres certain, there were certain parts of it that just didn’t seem to quite hit the mark. how did that, influence, your, understanding or perception of the material that they were talking about?

B2: well, once the little girl was done giving her shpiel, I, I sat and I listened to it, you know, I heard her out, and I didn’t really, go about navigating the website while she was talking, but, you know after she was done, then I was able to kind of forget about that and i looked at what the website had to offer (A mhmm) and thats, that’s actually when I became interested, was when she stopped talking.

A: ok, um, so, did you know, did you know prior to using, did you know prior to having her turn off hehe, that you could pause her or turn her sound off

B2 =no, I thought that, it was just, cuz sometimes, I run into some ads are very hard to pause, or turn off, and I thought ..she seemed like a part of the website that was gonna run its course, that, you
know, in the program she was just there and she was gonna talk (A 
mhmm) and not stop until she was done talking
A =but she seems very, very highly integrated into the site itself
B2 =yeah, yeah
A =ok
B2 it doesn't seem like that was its own little part over there
A =and then, you said that once you got past her, then you were, 
relatively impressed with the content
B2 yeah
A =could you talk more about that?
B2 well, it was, uh, it presented coal in a light that I hadn't really 
seen before, and it talked, it talked about using coal, you know, 
like I said in the past we'd burn it to get the heat energy (A 
mhmm) to heat steam, but it talked about even using it, using it 
for the, uh, hydrogen fuel cells, which I was impressed for, 
impressed with. cuz, you know, that's just using the energy in a 
different way, because you know, there is energy in coal, and if we 
can extract that without any negative affects on the environment, 
then, there's a lot of coal out there.
A =sure
B2 and, its not may, its maybe not completely renewable, but its 
something, once again, the united states has (A mhmm) and it would 
lesen our dependence on other countries.
A .k. um, so was there, was, ....did you , did you consider this, 
once you got into the content, did you consider this a fairly 
credible source?
B2 a yeah, it seemed very, it seemed professional it seemed reliable 
(A mhmm) it seemed like this was valid information
A what makes you, wha , uh, what about the site specifically makes 
you think that its professional and reliable?
B2 some of the language, that they’re giving, just, ah, I don’t know, 
it feels,..solid..if feels, you know, they’re talking my language, 
it’s kind of, you know, its friendly to the general population but 
at the same time, it’s, definitely, a little elevated, a little 
scientific, sort of (A mhmm) language in there
A sure, sure. .. now, we’re going to talk a little bit about how you 
were able to separate the, the kind of little avatar person from 
the content of the website. after viewing the website as a whole, 
your your stated, your stated reaction...let me double 
check.......was overall. was positive it wasn’t it wasn’t negative, 
and it was kind of a moderate amount of positive...ness (B2 yes), 
so prior to this website you had been very opposed to coal very ah, 
ah, you had a very low opinion of coal, and ah afterwards both of 
those measures increase. wha, what about the site can you talk
about that, that really made you or influenced you to make that, that change of opinion.

B2 well mostly, like I said the information, the information they presented showed that you know coal was moving forward, that it wasn’t something that was going to stay in the past that you know, from what I could tell they’re going to they’re going to be using coal in a different way than it had used it in the past.

A mhmm

B2 so and that’s what kinda upped my opinion of it, seeing that, this site showed that it was going to be moving forward with technology,

A ...ok....ah...do you , do you remember this web page

B2 a little bit

A now remember I asked you to look at two parts of (B2 yeah) the site within, and then I and then this is the second one um that’s talking specifically about futurgen, the coal power plant, um, now, splash screen the opening screen, has less verbal content, not as much words not as much data but it it has this very prominent feature um of of the child and this one is, where theress more information content. my my my question is, um, after you were done doing the survey and everything, did you go back to this site to look at it again?

B2 I think I did

A you think you did, what would, if you were going to, if you were going to do that what part of the sites would you be most interested in looking at.

B2 I would be interested in looking at the information in the text again, cuz, you know, reading something through once, you just kinda get a very general (A right) idea, (A mhmm)...just ah, go through and make sure that I didn’t get the wrong impression somehow.

A mhmm

B2 if it was what I thought it was

A right right

B2 I’m a very information oriented person. I like....

A what were you, um, can you kind of gauge the uh, the level of information on the website, like, did you, were you satisfied by the amount of information they gave you? do you want more information?

B2 well the pertinent information was enough, to, um, obviously, improve my uh opinion of coal (A mhmm). um. I think it was a good amount.

A mhmm

B2 I think it was enough, where..it was....it wasn’t so much information that , you know you kind of looked at it and got
overwhelmed thinking o my god I don’t really feel like reading all 
that, but, and it was, it was enough to say what it, I think it was 
enough to be effective, to say what it needed to say. 

A right right. um. did you detect any, any particular, um... ..i have 
to phrase this really carefully um...what did you think about the 
about the point of view of this particular website, um, did you 
notice, ah any particular bias, or did you, were you skeptical of 
anything on the website?

B2 well, I was I was a little skeptical at the beginning, because 
obviously I had sort of a negative opinion of coal (A mhmm) but I. 
I tried to keep an open mind, while reading it and (A sure) it 
seemed like, uh, when I read that part right there about capturing 
a hydrogen byproduct from coal, that was very interesting, that 
they would be able to produce electricity and produce hydrogen as a 
byproduct, which, you know, once again we can use that in the fuel 
cells.

A right. 

B2 that was, uh, yeah. 

A is there...comparing...I have to go back and grab a question that I 
missed before, um... the two things that I was really looking at in 
the survey, the, the uh, the sound and motion, the videos, and then 
the human personality, the spokesperson kind of thing, um...we 
talked about those and those are both present on the homepage, so 
we’ll flip back there, um....and you said that, the splash screen 
you didn’t like, you didn’t really like being talked to by this 
person, uh, you had a negative reaction to that, ah, but 
afterwards, after it was finished then your opinion or response to 
the site improved. what specifically...I guess, what was, what was 
influencing you to have that negative reaction more, was it the 
unsolicited kind of sound and motion, or was it uh, was it, the uh 
identity, or the point of view of the person that was talking to, 
uh, can you kind of gauge what was the most irri, what was the most 
off-putting for you?

B2 it was a little bit of both. the fact that, when I came to the 
site, it wasn’t like built in feature where I could say alright, 
this looks interesting I’m gonna play this, but it started right as 
soon as the site loaded

A mhmm

B2 and the fact that the little, the kid, does not, for me, it does 
not mesh with the general feel of the website. it’s a very 
professional website, and it looks like somebody whose done some 
work in the field is working on this website

A mhmm

B2 and, I don’t, I feel like a more credible source would be somebody
older, I’d, I’d feel more comfortable being talked to by you know, somebody at least looks like they had an involvement in the program. the kid just seems like, you know, the websites over here and then theres this kid off in the corner, talking to you (A mhmm) , that your, that’s just kind of a, like a little yipping dog or some sort of a distraction, over in the corner. A do you think that you would have had a more positive reaction if it was somebody, if it I was a different kind of person. B2 I think s, if, if it was a scientist, and I could or, er you know, at least, somebody who more credible, and I could choose to, you know, start that option, if you know, maybe if that play and pause button was, always, right underneath them, instead of being, if it was always there and visual instead of being, you know, you have to scroll over it to find it A right, yeah B2 I might have liked it better, cuz then. I could, just, if, if I had more control over whether I really wanted to listen to them or not. A right, yo you mean, you certainly would have, if it e-especially if it was the kid then you would have had a negative reaction to that, but (B2 right) but it wouldn’t have it wouldn’t have transferred as much to the site um B2 =right A but you already said that once the video was over the negative reaction that you had to that didn’t transfer much to the site anyway B2 right, yeah. I was able to say alright, that was, kind of weird, anyway. then move on (A ok, sure) to the rest of the website A mkay...was there anything prominent about the rest of the website that you wanted to talk about that you noticed that you found interesting or or particularly, that you had a particularly strong reaction too? that you liked, disliked, that we haven’t talked about B2 not really..like I said, I just thought, I don’t really, uh, put a lot of thought into design and structure and stuff like that. if the, uh, the information is presented in at least, a, you know, decent manner A mhm B2 and, you know, manageable manner, then I’m pretty happy with the website, that’s, that’s all I need to, think it’s a good website. A sure ok. that’s all the questions, that I , that I have right now, that I, that I need answered. if you have any questions or comments that you want to make you I’m I’m totally willing to turn it over for a bit B2 let me have a look at my answers and see (A sure) if theres
anything as I’m looking through there (A sure, no problem) I want to, uh, clarify, or expound upon.
A ......you may have to flip through.
B2 yeah... uh.
A Each group did a different part of the survey, so (B2 oh) your stuff might not start till the end.
B2 alright. so that’s what all these empties are
A yeah, yeah, so if you just flip to the middle of that packet
B2 .............alright, here we go.
A mhmm
B2 ..............................................................
A mhmm
B2 ..................at the beginning I was, you know, I agree with energy research but I didn’t know anything about them so I was sure sure sure
B2 just a little bit in their favor.........and the motion I talked about when I said the positive impact is that the, uh, the toolbar was kind of cool
A mhmm
B2 and I did like the ah, how those texts, how the text was in those little boxes with the arrows on em.
A so, uh, lets go look at those (B2 yeah) theses guys?
B2 yeah
A what, what was it about those that you liked?
B2 =there different, I hadn’t really come into contact with those a lot before. I I might have liked.. maybe some sort of a scroll bar or some sort of indicator of where I was at on the page
A sure, ok.
B2 but, uh..i don’t know, that idea of just having it in a, in that compact area, that I didn’t have to scroll down and loose the navigation bar to look at all the text.
A right, yeah,... ok
B2 =seemed like a good idea.......................so what, are we running over time or anything
A no, take as much time as you want
B2 alright
A the only time limit I have is you.
B2 he...I think that’s about it, really
A great
B2 its like I said that, uh, that kid really threw me off at the beginning but after that it was a pretty solid website.
A .good.....alright, thank you very much, I’m gonna shut down the recorders.
B2 alright
Appendix B: Interview 3

Speaker A: Interviewer
Speaker B3: Study Participant 3
“Speaker” C: Website Spokesperson
Topic: Speaker’s response to multimedia & agent-based engagement strategies on www.energy.gov/energysources/coal.htm

Duration: Approx. 20 min

1 A Ok, we should be good...now I’ve got the voice, and the video
2 recorders going. like I just said we were going through the
3 informed consent document that all the personally identifying
4 information that is collected will remain confidential, and,
5 anything that I use wont be connected to you in any way, ah, the
6 actual material in the camera and here I will keep in my
7 possession, forever, or until I destroy it, one of the two.
8 probably destroying it would come before never...mkay. I have here
9 a copy of your survey answers so we can refer to those at any time
10 we need to, um, and just as a refresher this is the website that
11 you looked at before (B3 right)...this is the department of
12 energy, the u s department of energy’s website about coal energy.
13 and what I want to do is I want to start with some questions about
14 what you knew about coal energy or energy in general prior to,
15 prior to using this website, are, are you someone who...kind of,
16 if you would for a moment talk about your interest in energy and
17 energy technology.
18 B3 um, I took ah, a power plant tour up in sioux city when I was in
19 9th grade I guess? so I thought it was kind of interesting, we, it
20 was a coal fired power plant, we (A mhmm) we went around and,
21 A mhmm
22 B3 looked around. I don’t know exactly why we went there, um, it was
23 for a futuring class, but it wasn’t a very futuristic place, I
24 mean it was...
25 A right, right
26 B3 um, but, I mean, it was one of those things I, I, although not a
27 science major kinda have a scientific mind, I like to know, you
28 know where stuff comes from, I’m not necessarily just content to
29 say oh I plug it into the wall and it works great (A mhm), so
30 till I know a little bit about how does it get there, you know,
31 and, I think its also like sort of a, like, professional
32 inspiration, if I work as a lawyer in a small town, to just kind
33 of know things about stuff so that, if people come from
34 backgrounds you have a little bit to identify with them, so
35 A so your working, your planning on working as a lawyer someday?
36 B3 right.
A: k and
B3: just having, bits of knowledge about anything, you know, I just think it's fascinating (A mhmm) I don't know a lot about many things, but I know lots about, you know...
A: a little bit about a lot of things
B3: right, right, that's what I meant.
A: mkay. had you, uh, what was your, what was your kind of opinion towards coal, the coal industry, and coal energy prior to using this website, just from when you were
B3: I mean, it's sort of problematic because it's a pollutant, ah...it sort of seems to be efficient, I don't know that we have anything...you know, I mean, they're talking now about the efficient free coal power plants, but, like I don't know that we have anything other than coal that's a great producer of energy, you know, wind works, sometimes, its small, you know, but...so its sort of one of those necessary things, and (A mkay) you know...it works pretty well, yeah it pollutes, and that's problematic, but
A: so its sort of, like, its the best we've got for now (B3 right) even though (B3 right) its not the best, ok.
B3: it seems to also have less risks than, nuclear power plants, which, you, uh, you know, you hear of these meltdowns and this kind of stuff, and
A: mhmm, sure
B3: you know, I guess I haven't heard, maybe just out of ignorance, but I haven't heard stories of coal power plants blowing up and causing problems (A mhmm) you know, so, seems like its probably a safer technology than...some alternative technologies.
A: so, given that, you now... sorry about that.
B3: eh, no problem.
A1: so, coal energy seems to have some negative environmental consequences, but, for you, that's comparable to other energy sources that are available
B3: right, I mean, yeah, it has some other positive things, and...(A k) I kind of have this you know framework of, like, economies kind of settle themselves out, so... you know, if some sort of energy was really that much better than coal, I'm not sure why we wouldn't be using, you know, I mean
A: mhmm
B3: it seems like, you know, if nuclear energy was far superior, considering the totality of what it is, and, what it you know, has to do, I don't know why, I, it just seems to be the way things generally function is, well if, we're going to try generally for the best thing, yeah sometimes we get lazy about, you know, we
could have been working harder on missions, controls, and these sort of thing but (A mhmm) you know, the best for the least amount of money, is kind of the.  
A =right... now, what, ah, what was kind of the main thing you learned form, from looking at this website, both this one and the subordinate page that you looked at?  
B3 um,...I thought it was interesting. I mean, its not something that, um, and I, I generally try to keep up with the news and I hadn’t heard a lot about, this, I mean, I supposed I could have assumed we would be working on it because, we seem to be working on a lot of things that not everyone knows about, ah, but, no I really hadn’t heard about it, it was interesting, um, seems like a good idea to me.  
A mhmm. ok. so, looking at your answers from the survey here, um,...starting of your opinion of coal was, was positive, but it was pretty moderate, kind of like you said, ah, you know kind of the best that we have right now, um. what um, you kind of had a similar opinion about support for coal research, and you know, you know, yes I support it (B3 right) but only because, you know, its what we’ve got. then, uh, I I I guess my my my next question is, ah, how familiar were you with the department of energy, the people that, published this website, prior to  
B3 not very much at all. I mean (A mhmm) I knew they existed, I knew they worked on energy things for the unites states I mean, but, not really  
A =ok, so, given, kind of, your low amount of familiarity, ah, what was your, kind of, opinion of, the department of energy...what did you think about them?  
B3 ....not really much of an opinion, I mean  
A ok  
B3 I I have opinions about government in general, so I suppose those sort of trickle down, you know, but  
A =what, what might those be?  
B3 there seems to be a lot of problems with inefficiencies in government, and so as we come up with things, but its just, kind of, this, you know, like...bogged down, you know, well I’m imagining this is somewhat under funded, so (A mhmm) you know...its just the sort of problem, I mean, because we sort of seek to, you know, minimize costs, you know the private sector isn’t doing it, so the government, I mean, its good that the government is picking it up but its sort of(A mhmm), if you could incentivize the private sector to do it with the competition that’s sort of inherent, it might be better.  
A sure, sure. ah. ok, looking at, you know, we we talked a little
bit about your, how you regarded the website, well not the
website yet, but how you regarded coal energy and the department
of energy, and there wasn’t a huge, change, in your opinions, from
before to after the website, would you say that that’s accurate?
that’s what the survey’s kinda saying. ah. there were a couple of
tings that you were slightly more positive on, you were a little
bit more in favor of doing research, your familiarity was a little
bit (B3 right) you were a little more familiar with, ah, with the
people, ah, is that kind of a fair approximation?

yeah, I think, well as I found out what’s going on its like, oh
this is kind of cool, like, (A mmm) this is actually doing
something, then, sure, we should keep research this, cuz, I mean,
(A k), I mean it seemed like they were to the point where,
they’re, like really close to having it, like, being able to build
it, so, its just some stuff now, I mean, if they’re actually
getting something done, then, great

mhmm. what, um, what was your reaction to the website itself when
you started when you started reading and browsing.

like, the actual thing?

yeah, what did you think of it?

its kinda cluttered, um, ....i like simple websites, they’re just
easier to deal with. I mean, sort of quintessential things, like
googles main page. you know, I mean, google has a lot of stuff,
and you can really explore it and get into it, but, you know on
some level, simple pages are, um, are just nicer to, you know. the
text is really small so if you want me to read the text, you know,
its kinda, with all this stuff but its kinda, (A mmm) you know.

one of the, ah, one of the things that I was specifically asking
about on the survey was the use of sound and motion, um, and, if
we look at, if we look at your responses to that part of the
survey real quick, ......I guess I’m gonna, I’m gonna ask you
again basically, what I can, what do you think about the amount of
motion that’s here on the sight, sound and motion, kind of
multimedia features.

there aren’t any really. (A k) that I found really, and I didn’t
find a lot of

mhmm...what do you think about that?..

I hate background sounds, it drives me nuts, I mean I’m almost
always listening to music or something while I’m doing stuff, so,
you know, if it says there’s a movie and I’m enticed to see the
movie, then that’s ok but, but like, stuff that’s going on, sort
of without my control, just drives me nuts, so I mean in that
sense its nice that there’s no like random, you know, sounds when
you mouse of the link or something.
A mhmm, sure um....
B3 before I came to college, too, you know I ha, um, we had dial up
connection so I still have kind of this mentality of less images, less multimedia, you know, I mean (A mhmm) lots of people have
gotten, you know, like there always on youtube they’re always on this they’re always on that, and like, its just not something I do, so I mean, simple text is, is pretty nice, I mean I think there could be less text and stuff, but having, having to go through media to understand the content of the website, generally I don’t like.
A mhmm
B3 you know, the, the sort of like, flash animation before the website, the, you know the website. I always skip them, you know.
A ok
B3 just, che, its sort of out my habit, well its going to take longer to load. even though I’m on a university connection, it really doesn’t, its just... you know...
A right, (B3 I don’t know) so your natural response is to kind of skip past some of that stuff
B3 right. I mean I unless I was really interested in this link for a movie I might not click on it.
A ok, ok ok. so, since there is relatively nothing here, you know, we’ve been talking a little bit speculative about multimedia, that, that isn’t here
B3 Right
A um, now, to refer that back to this sight, wh, I mean, how does the low level kind of affect you? or
B3 =well I mean, it, it’s nice. i think that could be, but I remember theres some picture of the emission, I, that’s, I don’t know if that,, if that’s multimedia, but there were some pictures of the emission free coal plant that I thought were cool
A ok, we, we can go to that page.
B3 yeah, like, I think opened a couple of the the pdfs, um, maybe the digital images is what I looked at (A mhmm)I looked at a couple.....i just thought that was cool. I mean, I u, I kind of have this side interest in architecture, too so its interesting to see like (A sure) you know it has kind of a futuristic look and, um, you know, I I think that kind of captured my attention
A mhmm
B3 and it was nice, I mean... they have the small images, so you don’t have to, I I think I opened a couple of the big ones, because I have a fast connection, but (A right) again, I was sort of happy that you know, its not like, inundated with stuff all over the place
A mkay, so, um, ..if you were, you know, if you were to compare this
to other sites that might have similar content, would you, ah,
would you prefer, now this like, like we've said, is a pretty, ah,
a pretty stark presentation (B3 right) not a lot of multimedia
stuff, um, where would you, you know, and your saying that
B3 generally when I'm here I'm not looking to be entertained, like, I
want information, and I read pretty fast, and I generally don't
think listening to something or watching something is a very
effective means of presenting information
A mkay
B3 =you know, I mean, the the it would take, you know images are
great because you couldn't capture that, I mean, it would be
several pages of text, if, you know, glass structure with this and
that yadda yadda on and on I mean,
A sure
B3 so, in that sense the images are nice, ah there there, there could
have been, I cant exactly conceptual what a video on this site
would look like, but maybe one video might possibly have been
useful, although I don’t know if I would have looked at it, but,
it seems generally that its more efficient to have text.
A mkay I think that helps me understand how you regard motion and
sound, multimedia features in general (B3 right) um, the other set
of stuff that I was asking about has to do with human personality
on the website
B3 ok
A which, ah, what did, uh, I guess, I’m gonna, I’m gonna jump back
B3 ok, sure
A to the beginning, then we can move around this, however you like,
but.. if you were to make a judgment, how much, or or, what
would you say about the the amount of human personality that is
apparent from the material that you can see on this website.
B3 can you clarify human personality a little
A right, well, the..yeah I can try. I wanted to use a term that was
general enough so that that it would cover a few different things,
but, so for example, can you identify a speaker, is there any
personal
B3 =oh, ok, does it appear like it came from a human, and not a, sort
of, (A right, right) automaton.
A ok, yeah that
B3 =there isn’t a lot of, like, humanistic touches, but again, I mean
generally these sort of design elements, or things, just tend to
annoy me, like I want to get information, I generally want to get
it pretty quickly. and so, if I have to wade through, like, image
of person with, you know, like, little, you know, Iowa state has
done this actually, like with admission stuff, you know you have
this choose your own adventure crap, and like its all (A hehehe)
images, and media, and like face with speech bubble for
information... like, yeah, I mean, maybe there's something to be
said for the way this sells stuff to people, and maybe it's a
different purpose, I mean, I don't know that we're selling
anything here,
A sure
B3 but, you now from a, again, its just like, I want the information,
I want it fast, concise, I don’t really care, I mean, I guess I
wasn’t looking for, like, you know, bob who’s the like head coal
researcher to be like, you know having, his little (A mhmm) face
up there, you know I mean, if its someone I would recognize, maybe
its nice to like connect it to an authority, but you know, there's
not going to be anyone that I’ll recognize, and say well, that, I
know that person there, you know I mean (A sure) its not like a
face of some senator where I feel like oh, well, senator such and
such, says, you know
A =I think somewhere in here there is, some stuff like that
B3 yeah
A I'd have to open it up, but, ....no, not this one..in any case,
you
B3 so when you, so there's not a lot, but that's, that's ok, I mean
A mhmm. would you have...
B3 I mean, there’s one up there with the president george w bush, now
I mean,
A right
B3 =sort of depends what you think of you know, george w. I I mean,
I’m pretty critical of politics, I'm a political science minor,
and I take a lot, where, and im’ taking this course now, where, I
don’t know if you know dirk dean,
A no
B3 N ok, well he’s sort of critical of current politics as sort of,
media spectacles, I mean, it sort of seems like, you know...if
this is really a big deal, like it would have been all over the
newspapers and we’d all know about it (A mhmm) but its not, you
know, so its sort of like, that’s nice that you said that, but
really that’s sort of a like happy political movement at that
speech to make those people happy and you know I mea, its not as
if you know, the thing he always compares it to is the space pro,
the early Apollo program where it was everywhere, you know this
was a huge, innovative, mind blowing things, which I mean this
kind of is, like, this is hugely innovative, where gonna have this
zero emissions coal, but no one knows about it (A mhmm) you know,
it, all this stuff has happened I think with very little fan
fare, and I certainly don’t remember, certainly there was no major
headlines saying you know, support for, or you know we’ve
generated the technology for you know, zero emissions coal power
plant, you know, pollution to dramatically decrease.

A =what did you think about the argument that the site was making,
did, um, did uh, did you tend to, uh, accept what they were
telling you, did you, did you think that its a persuasive website
B3 yeah, I think so. i wasn’t like hugely sold on it, you know, I’m
not like a huge environmentalist kind of person anyway, so I
wasn’t like, you know, running, like, oh my goodness, we have to
you know, I’m gonna go like contribute all the money that I have
A right
B3 =but I mean, you know...
A k. was there anything, was there anything that seemed like it was
missing from the website?
B3 not really that I can think, I , I didn’t have anything were I was
like, oh, what? you know, or oh this was a terrible hole in your
argument, or something
A =right. how did knowing it was from the department of energy, ah,
affect the way that you approach the site? did that, did that have
any affect?
B3 =I m I mean, d o e seems to be one of the, not as politicized, I
mean, there not like the department of defense that hear about all
the time, you know, the pentagon spending (A right) you know
somebody, it sort of seems like the people that are there probably
know what they’re talking about, so, (A mhmm), I guess I’m sort of
inclined to accept that, upon authority, cause I don’t have a lot
of knowledge, so its like, well this is probably an authority, (A
mhmm) you know I mean, its not gonna make it up on the web, unless
at least a few people have looked at it and kind of said, yeah,
youre not completely off base, so, I mean... you know its an
authority, yeah there might be a little spin in it, but (A mhmm)..<n
more or less its probably pretty..correct, so I’m more or less
inclined to say.. ok, this is right.
A did um,, this is, this is kind of , this is not exactly where I
normally put this question, but after you were done with the
survey, did you go back to this website to look up look up any
more of the information?
B3 no
A no, ok, um is it something that your interested enough in to kind
of look at more in the future at all, or if it came up, er. what
would be
B3 =yeah, I mean if it if it was in the paper, or like time magazine
or you know if there's something there, I'd read the article there
if there was a website, oh, I could look at it, (A hehe) but, you
know...sort of the lame excuse, but I'm sort of busy so you know
(A hehehe) I don't have a lot of time to devote to sort of watching
this you know, and it's not my chief interest and I don't know that
much about it so, you know (A mhm), yeah if it shows up in I'd be
like oh yeah, it you now, but, it'd have to be in something I was
more used to reading you now, (A right) if, if Iowa state somehow
started partnering with this and it showed up on the website,
like, I might look around, or if Time magazine or the register, or
something, like, picked up a story.

A I would like to, um, I would like to ask you to point out anything
on the site with regards to motion, sound, or to human personality
that you thought was prominent, that you noticed. Let's do motion
and sound first.

B3 I didn't really see anything
A not really anything at all
B3 I mean, with those questions on the survey I was kind of like,
huh?
A it's very difficult to write questions that work for more than one
artifact
B3 oh yeah, I've taken a couple research methods classes, so I
mean, I know, it's just like yeah its difficult, yeah I really
didn't see any so I was kind of like, well, huh, ok,
A right
B3 so I mean, there were those pictures, I liked the pictures, that
wasn't really motion or sound, but, I think that was kind of the
closest it got
A mhm
B3 like I said, though, the absences of it, in extensive quantities,
was nice.
A sure...ah, was there anything that you that you noticed at all
about the website that you thought was prominent or interesting or
that you were glad that you saw or that you weren't glad that you
saw anything like that
B3 well I think... they should have put like one of those pictures
on the front site about coal, I mean, its kind of boring. um...you
know, and, and those are the sort of things that I think would
capture peoples attention, I would have been more... you know, I
would have jumped a that and said, oh there's this, just cause it
looks cool, I mean the building looks cool, you know, so you know
not clip art, like that would have annoyed me
A hehe right
B3 =some cool image of what's going on you know for this
emissions free you know so, I I think that that would have (A mhm) kind of captured my attention because really the only images on there are this like, their their logo and then the little header thing, and then this stuff down here, (A right) you know so (A right) I mean there’s some places for images, or you could have made the text a little longer and you know and had images, like, beside the paragraphs... I don’t necessarily mind that, like small ones, not you know like, you know big image filling screen, text, big image filling screen you know so some kind of attention grabbing feature of some kind would have (B3 sure) would have been good here (B3 right), ok, but , probably not one that would not (B3 I thought that) a big video that would (B3 yeah dominating) kind of take over yeah, not that you click on this thing and they show you like the inside of a coal plant, and then you have to , you know, find the little link that says stop animation you know.

right right. mkay. is there anything at all that you’d like to bring up, I have to ask the question three or four times before I’m done with it. um, anything at all that you noticed that was prominent, how about the the=A

=I’m not a big fan of links in text. I think it just sort of breaks up, because when I look at it, I’m not inclined to read the text, I’m inclined to look at the blue underline things, (A mhm) which means I might leave that site before reading the text (A right) you know, I mean, I was doing a survey so I like tried to read the text you know like I tried to (A mhm) look at stuff, but if I’m just going here, I might see emissions free coal plant and then I have like no idea all the rest of the stuff, because I saw, ..the first link is too long, you know I mean, so I’m not gonna look at that, but I like that’s how you know I think your eyes work, is that you’re drawn to differences, (A mhm sure) so, you know, and emissions free coal plant is gonna be the first one that’s sort of like bite sized grab (A Mhmm) you know, cuz that first one is like low cu spans several lines, and you know if your doing things in a hurry if your looking for something, your probably going to go to emissions free coal plant sight, (A mhm) well if this text is important, you know I should be reading it, so there should be, like, a link off to the side, its nice , you know you can pair it with a picture, like for more information, or you know and then, you have to look through the text, which means that I mean presumably that’s the goal otherwise, why would they put text there (A mhm), so.

A this is, this is kind of a repeat question, but I want to go back to it a little bit, with regards to human personality (B3 mhm)
is there, is there anywhere on the site where you see some
prominent human personality or you see a prominent absence of it,
that where where.

B3 =well I guess, I mean, this this one has, like this site doesn’t
have personality, this front one (A mhm) there are no pictures,
so, I mean, sometimes its good because I tend to be a more text
oriented person (A sure), I mean, if your catering to a wide
variety of people, some sort of picture might be nice, somewhere
I mean, even a picture like down in that white space, just
something that, some color, you know, I mean,
A ok

B3 its its pretty dull. certainly if they were trying to sell
something you know, I mean, it helps to (A mhm) in a in a
rhetoric sense, just to have various things of you know, that
might capture peoples attention and and bring them into your
argument (A mhm) you lots of text, well, maybe
A if you were, I’m gonna ask two questions right in a row. if you
were to try and guess or try and determine what the target
audience for this website is, ah, what would you say, and then how
do you fit into that target audience. those e
B3 yeah I don’t know. I mean the site af, the emissions free coal
site seems to be more targeted at the public, since like there’s
actually some pictures theress some contact, so some people
interested in it, but on some level I mean, it seems like, its
targeted to, a really specific, like, people, working in, ah,
agencies, or industries affected by D O E, which I am not, you
know since I’m not interested in environmental law, probably wont
be. um, you, you know in that sense you sorta get the feeling that
your you know out of your zone, and they don’t do anything to
change that. and this site is a little bit better
A than the first part
B3 right, like I happen to notice it says your, and I noticed on the
first page, imagine the dent we could make in stuff, but the that
isn’t very prominent I mean that and the other thing was in a side
bar, which again is not where your attention is going, so there’s
not this first attention thing, because that’s a nice rhetorical
strategy, like you draw me in with this, we, and so now I’m part
of it, and I’m inclined to sort of belong, but that, that doesn’t
seem to be the like, main focus, like that’s a side bar, and yours
stays over here
A right. interesting
B3 you now, and not, sort of like, well, maybe, but
A mhm...well, this has been very helpful, I’ve got a lot of good
information
B3  ok
A  this, ah, if you like one more chance, to to say anything at all
about this website that you want, then, this is, this is your
chance
B3  =cant think of anything
A  its been really good for me but I don’t have any (B3 ok) further
questions right now, um, and actually I mean it, normally when I
say that I actually have three more questions and I’m just trying
to keep you going but, (B3 hahahah) um, so yeah, we can end up
the, we can we can shut her down (B3 ok), its been really
helpful. thank you very much.
1. Coal is one of the true measures of the energy strength of the United States. One quarter of the world’s coal reserves are found within the United States, and the energy content of the nation’s coal resources exceeds that of all the world’s known recoverable oil. Coal is also the workhorse of the nation’s electric power industry, supplying more than half the electricity consumed by Americans.

2. Coal-fired electric generating plants are the cornerstone of America’s central power system. To preserve this economically-vital energy foundation, innovative, low-cost environmental compliance technologies and efficiency-enhancing innovations are being developed by the Energy Department’s Fossil Energy research program.

3. To tap the full potential of the nation’s enormous coal supplies, the U.S. Department of Energy’s Office of Fossil Energy is working with the private sector to develop innovative technologies for an emission-free coal plant of the future.

4. This research and development program is pioneering more effective pollution controls for existing coal-fired power plants and an array of new technologies that would eliminate air and water pollutants from the next generation of power plants. Research is also underway to capture the greenhouse gases emitted by coal plants and prevent them from entering the atmosphere.

5. For statistical information relating to the extraction and consumption of coal and the electricity it produces, visit the Energy Information Administration.
Figure C.2 Coal Energy Portal Carbon Sequestration Page

Key R&D Programs and Initiatives

The Carbon Sequestration Leadership Forum
DOE is working with the Department of State to organize an international ministerial-level panel that will meet regularly to discuss the growing body of scientific research and emerging technologies and plans joint projects for carbon sequestration. Read More >

Regional Sequestration Partnerships
DOE is creating a nationwide network of federal, state and private sector partnerships to determine the most suitable technologies, regulations, and infrastructure for future carbon capture, storage and sequestration in different areas of the country. Read More >

The FutureGen initiative
The $1 billion FutureGen project, announced by President Bush on February 27, 2002, will capture and store carbon emissions, making it the world’s first coal-fired power plant to incorporate carbon sequestration technologies. Read More >

Carbon Sequestration R&D Program
DOE’s Fossil Energy program is developing a portfolio of technologies that capture and permanently store greenhouse gases. Read more about DOE’s sequestration R&D program by clicking on the following links:
- Sequestration Overview
- Geologic Sequestration
- Ocean Sequestration
- Terrestrial Sequestration
- Novel & Advanced Concepts

RELATED NEWS
- Regional Partnership Provides $8,000-Acre Well for Critical Carbon Sequestration Research
- More Related News

PROJECT INFO
- National Energy Technology Laboratory Web Site
- Database of Carbon Sequestration R&D Projects

KEY PUBLICATIONS
- Carbon Sequestration Technology Roadmap and Program Plan - 2006
- More Publications

QUICK FACTS/LINKS
- Government-Wide Data Base on Carbon Sequestration Projects and Research Papers
- U.S. Department of State web site on the 5th Session of the Conference of the Parties to the UN Convention on Climate Change

PROGRAM CONTACTS
- Scott Klara
  National Energy Technology Laboratory
  PO Box 10860
  U.S. Dept. of Energy
  Pittsburgh, PA 15236
  412-399-1865
Figure C.3 Learnaboutcoal.org Front Page

Blog Topics

- Carbon Capture Technology ... it's closer than you may think.
  WANT proof that technology to capture carbon emitting coal-fired power plants is moving along more quickly than maybe some people think? Here's one.

- MIT Climate Study - Read Beyond the AP's Headline
  If you just read the headline of the recent Associated Press story, "Coal industry faces bleak future; then, you would have been pretty pessimistic about coal's future in America's energy mix. After all, the key findings of the recent MIT report are that without more advances in technology, coal's role would be uncertain in a carbon-constrained world.

- I've become more successful ... but it's OK
  If you're not the most of you, then you're looking for ways to stay on top of your costs. So, when applicable, like...
Promise of the Future

What you’ve learned up until now may challenge some of the ideas you have had about using coal to generate electricity. But, to quite some popular song lyrics – you ain’t seen nothing yet.

With advances in technology – coal, a resource that some may think of as old, dirty, and somewhat outdated – can be a pollution-free energy option for America in the coming years. Scientists and engineers from the government and private sector have been working together since the early 1990s to develop the technology roadmap for the ultra-clean, coal-based electric power plants of the 21st century.

An example of the progress being made is FutureGen. This project is an international collaboration being led by the United States, which will create the world’s first coal-based, zero-emissions power plant. FutureGen will produce electricity and a hydrogen by-product from coal, while capturing greenhouse gases through emerging sequestration technologies.

FutureGen will begin operations around 2012 and virtually every aspect of the prototype plant will be based on cutting-edge technology. At the heart of the project will be coal gasification technologies that can eliminate common air pollutants such as sulfur dioxide and nitrogen oxides and convert them to usable by-products such as fertilizers and soil enhancers. Mercury pollutants also will be removed.

These technologies also will turn coal into a highly enriched hydrogen gas, which can be burned much more cleanly than directly burning the coal itself. Alternatively, the hydrogen can be used in a fuel cell to produce ultra-clean electricity, or fed to a refinery to help create petroleum products. In the future, the plant could also become a model hydrogen-production facility for automobiles – thus reducing America’s reliance on imported oil.

But the FutureGen project is just one step toward a zero-emissions future for coal. Using a variety of advanced technologies – the coal-based generation fleets of tomorrow will be different from today. And the technology development here in America can be used in other countries – helping address climate change and other environmental concerns.
## APPENDIX D: ARRAY OF WEBSITE ELEMENTS

<table>
<thead>
<tr>
<th>Informational elements</th>
<th>Persuasive elements</th>
<th>Engaging elements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accessibility</strong></td>
<td><strong>Credibility</strong></td>
<td><strong>Multimedia</strong></td>
</tr>
<tr>
<td>Navigational Cues*</td>
<td>Design/Style†</td>
<td>Typography</td>
</tr>
<tr>
<td>Architecture*</td>
<td>Sources*</td>
<td>Imagery‡</td>
</tr>
<tr>
<td></td>
<td>Ethos°</td>
<td>Sound†</td>
</tr>
<tr>
<td></td>
<td>Academic Rigor°</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Current**</td>
<td></td>
</tr>
<tr>
<td><strong>Usability</strong></td>
<td><strong>Appeals</strong></td>
<td><strong>Interactivity</strong></td>
</tr>
<tr>
<td>Identifier*</td>
<td>Logos&quot;</td>
<td>User-generated content</td>
</tr>
<tr>
<td>Transitions*</td>
<td>Pathos&quot;</td>
<td>Functionality</td>
</tr>
<tr>
<td>Design*</td>
<td>Ethos°</td>
<td>Hypermediacy‡</td>
</tr>
<tr>
<td>Simplicity†</td>
<td>Values&quot;</td>
<td>Human Personalityª</td>
</tr>
<tr>
<td>Immediacy†</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Understandability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Register†</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Content*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual Aids*†</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sequence†</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Burnett, †Shneiderman, ‡Bolter and Grusin, °Stapleton & Helms-Park, ªBurke, “Aristotle
APPENDIX E: LEARNABOUTCOAL.ORG BLOG

NOTE: The blog entries included in this appendix are intended as supplementary data since they provide further insight into the relationship between the administrators of Learnaboutcoal.org and its audience. They are presented here exactly as they appeared online, preserving errors in usage and mechanics, and without censorship. Only the formatting has been altered to aid readability.

Fortune article shed new light on leadership on climate issue

Thursday, August 3, 2006 @ 4:27 PM

I hear this all the time … “because opted out of the Kyoto Protocol, we’re not showing leadership on the issue of climate change.” Well, maybe this [recent article in Fortune] will help put to bed the idea that the is alone in seeing that the Kyoto Protocol is not worth putting our country’s economy at risk.

Read the article, most of the countries that ratified Kyoto are no where close to achieving their commitments; then tell me what you think.

COMMENTS (6)

Joe,

In a reply earlier you mention “technology that will make it possible to capture CO2 emissions”. Just how do you capture the CO2 and what do you do with it? Or do you have some way of obtaining energy from carbon without producing CO2?

I have spent a few years working in one of the nation’s most efficient and largest coal fired plants. I do agree that much is being done to make them cleaner (reduction of SOx, NOx, particulates) but the CO2 is still a problem.

John

Joe replies:

John, there are obviously two components involved here ... first create less CO2 (higher efficiency) and then capture the CO2 that is created. Both are important. Not sure how long ago you worked at a power plant, but I’m guessing if it was more than just a few years ago, technology to capture higher levels of mercury (beyond 35 to 50%) wasn’t available then. But today, technology is emerging and it is looking like capturing higher amounts of mercury (70% or more) is certainly doable. The same is true with CO2.
Some designing and testing carbon capture technology, and it is clear that technology is certainly on the horizon. It is just a matter or when and how.

**By John on 11/06/2006 7:22 PM**

Where did you get all this information so that I can find out even more? I’m really interested. Like alot of other comments you most likely got, how does the government now all about coal? I am a little confused and that’s why I am looking for more info. I agree with Dan, atleast they are trying to make a difference.

**Joe replies:**

This was an article from *Fortune* magazine (and the clip was posted). Also, who says the U.S. is doing nothing? Why don’t we get credit for leading the effort to develop and deploy the first emissions-free coal-based power plant. This is technology that will ultimately be used to reduce emissions here in the U.S. as well as around the world. To me, that is a pretty big deal (better than making a commitment and then failing to meet it).

**By Travis Tanksley on 10/30/2006 10:48 PM**

This website is an absolute farse. King Coal should be ashamed of exploiting children in their advertisements. The US not involving itself with the Kyoto Protocol serves only to benefit the coal industry because of Kyoto identifies CO2 as a harmful greenhouse gas. It is not in America’s best interest to continue mountain top removal and disrupt the carbon cycle by burning coal.

I am in disbelief that this website claims to be non-partisan.

**Joe replies:**

Hey, it’s pretty easy to say you disagree, but you didn’t give any specific fact which you dispute. Also, as I said earlier, why is it OK for the Ad Council to use children in the commercials related to climate change and some how or another it is not proper for us to have children in commercials talking about technology that will make it possible to capture CO2 emissions at power plants? Again, if you don’t like the message ... don’t shoot the messenger.
By the truth on 10/28/2006 1:49 PM

Coal is still a non-renewal resource. Fossil fuels are not the answer. Why not save your advertising money and invest in truly clean energy resources like wind and solar energies? If we could perfect a cheap and simple method to capture the rays our sun produces every minute of every day we wouldn’t have to plunder our earth’s treasures to maintain our comfortable lifestyle.

Joe replies:

Chris, you’re right, it would be “nice” if we could perfect solar energy for use here in the U.S., but the reality is we don’t have enough direct sunlight here in the U.S. to make it feasible for widespread use in generating electricity. So while fossil fuels may not be perfect, they are practical.

By Chris on 09/25/2006 4:33 PM

It is dangerous politically for the American government to not at least look like it is trying to make a difference. Failing to sign our name on the dotted line along with the world is a clear indication of apathy if not a complete opposite intentions of the American government.

It doesn’t not matter if the goals set have not yet been met. Perhaps the bar was set too high. The failure to not meet the goal does not necessarily indicate the supporting countries intentions. At least they are trying to make a difference.

Joe replies:

Dan, If I’m given the choice between “motion” or “progress” ... I generally choose progress. Who’s to say that the U.S. isn’t “doing anything” to address the issue of climate change. What other country is working on the development and deployment of carbon capture technology for fossil fuels? Sure, some other countries are a part of the international contingent that is supporting the FutureGen project, but mainly this is a U.S.-led effort (with the federal government and U.S. industry sharing the costs). My prediction, this technology (one demonstrated and deployed) will have a much more dramatic impact on reducing emissions than all of the “motion” associated with agreements like Kyoto.
Mr Gores movie on global warming is an out right lie and it is typical of the lefts lies and deceit of this country. 80 % of the scientists say its a lie. We are aprox 1/2 a degree warmer then we were 100 years ago The polar ice caps are not melting they are growing in size. The high temperature in the hottest part of the summer is 25 degrees. Ice does not melt at 25 degrees. I believe if you were to investigate you would find that the alarmists own the companys that would profit most from more stricter air quality standards. My company has a 1990 1 ton truck, the smog standard limit for this truck is 150 parts per million the truck has 112000. miles on it, at the last smog inspection last year it put out 10 parts per million. But the sierra club and the alarmists want even stricter standards. The vehicles from 1988 up are so clean that there is almost nothing more that can be done. Anchorage alaska has stricter standards then california and only has 600,000 residents but worse smog. The los angeles valley was called the valley of smoke by the indians, there was smog here before there were cars or industry. Its time for america to wake up and quit listening to the left wing alarmists and tell the government to get out of the propaganda business.