Print, Film, and Hypertexts: A Multimedia Model for Discipline-Based ESL Instruction

Using multimedia to present discipline-based content improves ESL instruction.

by Loretta F. Kasper

Introduction

The population of students learning English as a Second Language (ESL) has been steadily increasing since the 1970's. In fact, a 1994 report from the City University of New York indicated that by 2000, approximately 50% of students enrolled in colleges and universities in the United States would be nonnative speakers of English. To succeed in college, these students must develop, not only linguistic, but also academic skills. These skills involve using English to acquire and articulate knowledge by reading academic texts, writing acceptable academic prose, and conducting and reporting research. Further, because computer technology has become an integral part of the college curriculum, ESL students must become proficient in accessing and using electronic resources.

To meet ESL students' academic needs and help them develop strong English language skills, instructional programs should provide abundant opportunities for interacting with diverse texts that give students a solid background in the tasks and the content of mainstream college courses. This article describes an instructional model that develops ESL students' linguistic and academic skills through extended study of discipline-based content presented through multimedia: tra-ditional print texts, film, and electronic Internet hypertexts. Students must use English as they gather information and analyze discipline-based issues and concepts. In the process, they become familiar with and practice the linguistic structures and vocabulary in academic texts.

Discipline-Based ESL Instruction

Recent ESL research (Benesch; Brinton, Snow, and Wesche; Kasper "The Impact") has demonstrated that discipline-based instruction (DBI) enables ESL students to acquire linguistic and academic skills quickly and efficiently. A discipline-based course employs a variety of tasks to teach academic content, and at the same time, to help students develop proficiency in reading, writing, listening, and speaking. As ESL students engage in these tasks, exploring and discussing concepts in subject areas, they are exposed to and encouraged to use academic language.

DBI aims to prepare ESL students for the demands of mainstream college courses, and for students to be successful in the academic mainstream, they must also acquire research skills. First, students must be able to deal with the often sophisticated language found in resource materials, and second, students must be able to choose the resources that best sup-

port the points they wish to make. However, ESL courses have not traditionally included research skills, making research reports especially frightening for ESL students and challenging their English language skills (Horowitz).

A discipline-based course offers an excellent setting in which to teach research skills through an activity known as focus discipline research (Kasper "Sustained Content Study"). A focus discipline is a subject area (e.g., psychology, biology) that the entire class studies as part of its coursework, but one that individual students choose to research more extensively over the course of the semester. Students choose their area of study based on personal interest and/or college major. Because students choose to do extensive research in a particular discipline, they immediately become engaged in a personally meaningful learning experience.

Students who have chosen to study the same focus discipline form a "focus discipline group," in which they work both individually and collaboratively to collect information. This collaborative study offers ESL students the opportunity to work together in the process of constructing knowledge as they elaborate and reflect on both their ideas and those of their peers. Collaboration promotes active engagement in learning, creates common group goals, and encourages mutual help among ESL students to achieve these goals, as peers become resources for furthering knowledge and understanding of both content area and linguistic information (Strommen and Lincoln).

The Use of Print Texts

The print texts used in a discipline-based ESL course present students with sophisticated reading that contains cognitively demanding language and introduces a wide range of vocabulary. These texts offer students extended practice with both the language and the content of college texts and can help students gain linguistic and academic skills. However, ESL students may have difficulty fully comprehending discipline content when presented solely through print media. Discipline-based information may be made more accessible, and hence more comprehensible, to ESL students when presented in a multimedia format, using both print and visual texts.

The Use of Film Texts

Film texts can be used to provide a visual representation of material previously provided through print texts. Thus, a student may read a print text and later view a film depicting the same topic. The visual representation of the print text through the film can clarify comprehension, consolidate concepts, and reinforce learning, thereby helping ESL students deal successfully with sophisticated textual material (Kasper and Singer). According to Chun and Plass, visual texts aid the comprehension of print texts in two ways: (1) by facilitating the construction of referential connections between the print and visual representations of the material, and (2) by adding supplemental information to the mental model of the text. The resulting text representation, therefore, consists of the collaborative effects of processing information that has been presented in a multimedia form. Students can then draw upon both visual and verbal cues to enhance comprehension.

Whether viewing the complete film text or excerpted sequences, ESL students benefit from graphic, visual illustrations of key critical thinking concepts. Students' reactions to and interpretations of the images seen in the films are the product of their individual experiential and cultural background (Corrigan). These per-

sonal reactions can then be directed to and examined within the context of various areas of academic discourse such as psychology, environmental science, and others to broaden the verbal and written perspective (Kasper and Singer).

The Use of the Internet

Computer technology has given us Internet hypertext, an electronic medium in which both print and visual resources are invariably bound. At the click of a mouse, hypertext resources present students with a diverse collection of authentic English language texts dealing with a wide array of interdisciplinary topics, and at each Web page link, students have the advantage of reading print texts with the benefit of immediate visual reinforcement provided by pictures and/or slide shows (Warschauer), facilitating the collaborative effects of print and visual information processing.

However, to benefit from the Internet, ESL students must learn to navigate and then evaluate the information found there. To do so requires knowing how to use search engines, Web browsers, and metasites to locate, retrieve, and evaluate information in terms of its validity and reliability, as well as its relevance to the topic under study. According to Carlson, ". . . sources have credibility to the extent that they derive their conclusions from the most relevant, objective, and explicit methods available . . ." (40). Therefore, to guide them in determing whether an Internet source is reliable and credible, students should consider the source and time frame, as well as the evidence supporting the information provided.

As ESL students become more comfortable surfing the Internet, they discover that it is a vast resource that can be used to develop not only content area knowledge, but also linguistic proficiency. They become engrossed as they explore Web sites related to their focus discipline and then apply what they have learned to real-life situations. Using the computer encourages learner autonomy and initiative, as ESL students discover that they are able to read and understand material written in English, to find information when they need it, and discuss that information with peers. Students learn how to compose a coherent essay, using information from the sources they have found on the Internet, and they learn how to cite these references in a bibliography. The research skills students acquire by using the Internet to locate electronic sources also carry over into traditional library research with print sources. Thus ESL students learn skills that they will need and use throughout their college years.

Illustrating the Approach: A Sample Lesson

Using print, film, and hypertexts in a discipline-based ESL course requires a bit of planning and the use of appropriate materials. I use the text, *Interdisciplinary English* (Kasper), which contains readings in ten different disciplines: linguistics, environmental science, computer science, mathematics, business and marketing, psychology, sociology, physical anthropology, biology, and diet and nutrition. During the first week of the semester, each student chooses a focus discipline from among these ten subject areas. My students are at the high-intermediate to advanced level, which is equivalent to an entry TOEFL score of approximately 425.

I will illustrate the instructional approach through a sample lesson from the unit on environmental science. This lesson requires about eight to ten hours of class time in a class that meets six hours

per week for twelve weeks. The topic is global warming, or the greenhouse effect, and students learn about the greenhouse effect, its immediate and possible future impact on weather, and the resulting effects on issues in disciplines such as business and nutrition. The greenhouse effect is a timely topic and one with a great deal of information on the Internet.

The lesson begins with a classroom discussion in which students consider how the earth's climate has changed over the past ten years. They discuss unusual storms, floods, drought, famine, or heat waves and how these events relate to global warming.

The greenhouse effect is a somewhat abstract topic, one that requires some understanding of complex chemical principles. Visual media provide an effective way to make the abstract scientific concepts concrete and, thereby, facilitate comprehension. To illustrate the greenhouse effect, I draw a diagram depicting the earth, the sun, and the ozone layer on the chalkboard. While viewing this visual, students go step by step through an analysis of what happens when the sun's ultraviolet radiation mixes with man-made pollutants. The diagram facilitates comprehension in two ways—it serves as a visual pre-reading exercise, and it provides students with an imagery link to the complex scientific concepts they will confront in the reading from their textbook entitled, "The Greenhouse Effect."

This reading defines the greenhouse effect and explains the cause/effect relationship between greenhouse gases and global warming. The text details the environmental, chemical, and political implications of ozone depletion and global warming. Thus the textbook chapter provides a general description of the greenhouse effect and discusses the many areas of everyday life affected by environmen-tal factors. The chapter also offers a general view of what may happen if the greenhouse problem is not solved in the near future.

As students read the textbook chapter, they also engage in vocabulary building and express their understanding of the text through written answers to open-ended comprehension questions. We discuss the contents of the chapter in class to check comprehension and clarify any questions students may have. Next, the students view the film documentary *Crisis in the Atmosphere*. This film describes the problem of global warming, focusing the camera on actual (though sometimes simulated) situations. Thus, the documentary creates a feeling of "being there" as it chronicles the problem of global warming through visuals and spoken narration. In this way, the film presentation resembles a cause/effect essay.

The documentary takes students inside a glacier to study "fossil" air, teaches them about chloroflurocarbons (CFCs), and examines the environmental effects of Chernobyl, the Exxon *Valdez* spill, and the burning of the rain forests in the Amazon. One of the key sequences in the film is a visual depiction of the chemical process through which ozone is destroyed by CFCs. Film imagery takes a difficult scientific concept and presents it visually, enabling students to understand the concept more easily.

Another key sequence in the film shows the air in Los Angeles viewed through time-lapse photography. This sequence presents a powerful visual image that reinforces the effect of greenhouse gases on the air and relates it to everyday life. The film works effectively to clarify the printed text and the cause/effect relationship of greenhouse gases to environmental pollution as it stimulates students' interest in and responses to the problem.

The vivid film images give students a concrete stimulus for using their own imaginations to predict the future effects of global warming.

Next, students surf the Internet to find additional information on the greenhouse effect. They must become familiar with Internet search engines, such as Yahoo!, Infoseek, or AltaVista. They must learn how to enter keywords to identify the information they want. Then once the Internet search engine has returned a list of "hits" for the keyword, students must go through the list to find the most appropriate and/or useful information for their essay. Engaging in this activity gives students practice in an important research skill: distinguishing between relevant or irrelevant information. To guide them in developing this skill, I provide the worksheet shown in Figure 1.

Many Web sites discuss the greenhouse effect and its potential impact, covering issues in a number of different disciplines, such as business, nutrition, and government. Articles explore the potential consequences of global warming; some dismiss the greenhouse effect as a hoax.

As students read and discuss these essays, they confront contrasting opinions on the issue, and the course has prepared them to evaluate those opinions. Individual students then share the articles they have found with the class, and together we discuss the points made in each. This activity provides a wonderful opportunity to teach students how to present and examine differing viewpoints in an essay. We put up a chart on the chalkboard and list the arguments for treating the greenhouse effect as a genuine problem versus those for viewing it as a hoax.

The weather plays a major role in everyday lives, so students become very involved in researching this topic. Whatever their personal viewpoints, the topic always sparks lively discussion in which almost all students, even those typically shy and quiet, express an opinion. Thus, Internet research becomes a vehicle to develop speaking and listening, as well as reading and writing skills.

The verbal and visual links created by the print text, the film documentary, and the Internet resources provide ESL students with the tools they need to engage

1. Does the information add anything to what you already know about the topic?
2. Who is providing the information contained on the Internet page?
3. Where did the information come from?
4. Is evidence provided to support the points made?
5. How old is the information?
6. When was the Internet page last updated?
7. How broad is the topic?
8. Is the information provided in a WWW or gopher document, a text file, a newsgroup posting, or an e-mail message?
9. Is the information clear and well organized?
10. Who recommended this site as a good source of information?

Figure 1. Evaluating Internet Resources

in a critical analysis of cause/effect issues within the framework of the problem of the greenhouse effect. Therefore, the writing activity for this lesson asks students to compose a cause/effect analysis in response to the following essay prompt:

> Imagine that it is the year 2050. Although governments and their citizens were warned about the dangers of the greenhouse effect as early as the 1970's, they did not take the necessary steps to prevent it from worsening. As a result, global warming and ozone depletion continued unchecked. In a well-organized essay, describe what life would be like in the year 2050 under these conditions. What would be the state of the climate? What would the nations of the world look like? What would be the day-to-day living conditions of the people of the world?

In this assignment, I encourage students to approach the written piece with a mixture of facts and imagination, and they do very well with it. The following excerpt from a student essay illustrates:

> When I was born in 1950, the Earth was clean and beautiful. But people did not take care of it. They began to build a lot of factories, many cars and other things that polluted the air. . . . When I was 15, the scientists discovered that there was a big hole in the ozone layer—the Earth's natural protector against UV radiation. . . . Because of the ozone hole a lot of people started getting sick and died. . . . Because of pollution and the ozone hole, there was a "greenhouse effect," the temperatures rose very fast, and now there are very hot climates everywhere. The equator area in 2030 became a desert without any signs of life. In 2045, all the Earth's glaciers melted away and water flooded a lot of lands. . . . Everyday life is hard because of lack of food, polluted air, and strong hurricanes. People struggle with each other for every piece of land, for food and water to drink . . . . Sometimes I remember the past times, and I reflect upon why we did not take the necessary steps to protect our world. . . . I

think that [people] forgot that the Earth is a wonderful gift that needs to be treated with respect and love.

As they explore predictions about the future condition of the earth's environment and articulate complex cause/effect relationships, ESL students call upon the verbal and visual images presented in earlier stages of the lesson. This writing assignment is effective because it asks students to use the English language to demonstrate knowledge and to draw inferences, both critical to success in academic tasks.

Focus Discipline Research

While the entire class studies the problem of the greenhouse effect and uses the Internet for additional research as part of the environmental science unit, students in the environmental science focus discipline group continue to research this subject area throughout the semester. As the class moves on to study other disciplines and some students focus on specific issues within them, the environmental science focus group continues to research the greenhouse effect and its potential impact on issues within these other disciplines. These students continue to search for Internet references, beginning, for example, with the Yahoo! search engine and following links to Web pages dealing with the impact of global warming. One such link might bring students to a Web page published on December 2, 1997, by CNN Interactive that contains the article, "Global Warming Debate: Dueling Views of the Future." This Web page is multimedia in nature, displaying print, pictures, and interactive video. The article reports on the landmark international conference held in 1997 in Kyoto, Japan, where negotiators from around the world worked on a global warming agree-

ment. The text presents the opposing viewpoints of politicians, economists, and environmentalists attending the Kyoto conference—"that of a world where reduced fossil fuel use would cause economic chaos and that of a post-industrial utopia created by the same reductions." Students are able to read this text, to hear and see a report of conference events, and to participate, via an Internet message board, in an interactive "point-counterpoint" debate on global warming.

As they conduct this focus discipline research, students learn how to make cross-disciplinary connections between environmental science and other content areas. They are encouraged to form and to express their own opinions on the issues, first by participating in the interactive debate on the Internet and then by composing a written response to an essay prompt, which asks them to discuss the effects of a changing climate on the behavior of the world's governments.

The following excerpt from a student essay illustrates:

> Scientists who study the earth's atmosphere and climate have been talking about the greenhouse effect and finally about global warming . . . . Politicians, who for years have ignored the warnings of scientists and environmental protection movements, are becoming alarmed. They are announcing and making decisions on an international scale. . . . Ten years ago the nations of the world came together in Montreal to take wise steps toward protecting the Earth's stratospheric ozone layer. These efforts were expanded in the scientific discovery— a hole in the ozone layer above Antarctica, which was the size of the North American continent. After that discovery was confirmed, the world's political system began to sign any agreement much easier than before. . . . All the nations of the world will need to work together to develop our steps after the year 2000. So we must achieve a new aim for the future. . . . Unless we tread

softly, our dreams for the future will be nothing but dreams. Let us make sure that our next steps are the right ones.

In the full text of the essay, this student describes the specific dangers of global warming, scientists' warnings about them, and presents a chronological listing of the steps the world's governments have taken to address the problem. The essay is cogent and well-organized, combines factual information drawn from science and government, analysis of cause and effect, and concludes with a persuasive argument that calls for the cooperation of world governments to solve the problem of global warming.

Student Achievement and Feedback

The excerpts from student work are representative of the quality of the projects produced by students in this course. Overall, students exposed to a multimedia discipline-based instructional format do extremely well, as evidenced by a pass rate of 92% on departmental reading and writing examinations. In addition, when asked to complete questionnaires requesting their feedback on the course and its activities, students' response is overwhelmingly positive. They express increased confidence in their ability to use English. They attribute this improvement to the multimedia model, saying that the texts teach them English and provide information helpful in other courses and that the film and Internet resources help make material easier to understand because they see, hear, and read about the topic.

Conclusion

The instructional paradigm described here makes use of print, film, and hypertexts to develop and enhance linguistic and interdisciplinary knowledge.

Through their interactions with multimedia texts on topics of interest, ESL students become increasingly familiar with academic vocabulary and language structures. As they pursue sustained study of one content area through focus discipline research, the students become actively engaged in the process of meaning construction within and across different media. Working through the "complex intermingling of meanings, embedded within different texts" (Tierney 1177) encourages students to make interdisciplinary connections as they build a wider range of schemata, which are then available to help them grasp future texts.

Integrating the Internet into a discipline-based ESL course yields the additional benefit of increased student motivation. Students are eager to begin class and often arrive early at the computer lab, logging on to the Internet and beginning research on their own. They also often stay after class to continue working on the Internet. Overall, students develop greater confidence in their ability to use English because they need to interact with the Internet entirely through reading and writing. Using the Internet for focus discipline research not only teaches higher order thinking skills, but also promotes critical and social literacy as students encounter a variety of information, synthesizing that information through cooperation and collaboration with their peers. Members of focus discipline groups generally form strong multicultural friendships fostered by their collaborative efforts throughout the semester.

Using print, film, and hypertexts as resources for discipline-based study provides students with opportunities to gather information through instructional stimuli that stimulate their imaginations, engage their interests, and introduce them to the raw materials for analysis and interpretation of both language and content. Students develop a solid foundation in several subject areas and become "content experts" in one. Thus, they greatly increase their overall knowledge base, as well as their English language and critical literacy skills, facilitating their performance in future college courses.

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