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ABSTRACT

This paper describes and outlines a college level, energy geography course which uses a group review process approach. The goal of the course is to bring together students from across the university with a strong interest in energy problems to pursue areas of individual concern subject to peer review. The group review process fosters communication among the class, helps to improve student writing skills, and permits students to draw upon their own areas of expertise in evaluating a proposal or paper written by a student from another discipline. The first month of the course involves students in a fair amount of reading to familiarize them with energy problems, technologies, and issues. The second half of the course is structured around the development of the research papers or projects. Students, working individually or on a joint project, are required to submit a research proposal/prospectus or a preliminary paper. The class is then divided into groups of five students each. Each of the students in a group is given copies of the group members' research proposals or papers to read, review, and critique. This should take about one week. At the end of that time students come back together, go into their respective groups, and evaluate each paper in turn. After each student's proposal or paper is evaluated, the student collects written comments from each student and uses these as a guide in revising the work. Students also have periodic meetings with the instructor who provides additional input into the development of the research project. (Author/RM)

GROUP REVIEW APPROACH TO THE TEACHING OF ENERGY GEOGRAPHY

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Energy courses are popular additions to the curriculum at many U.S. colleges and universities. Energy is a national concern and many students wish to gain substantive knowledge of energy technologies and issues in order to be prepared for employment or further study. The geography of energy, as taught for many years, focuses upon the distribution and transportation of energy resources. Although this approach is important and valid, at large universities with a multifaceted energy research mission, energy geography courses provide a unique opportunity to synthesize various disciplinary approaches to energy problems. For the past two years the "Geography of Energy" at West Virginia University has emphasized individual development goals and pedagogic design rather than a particular body of knowledge.

West Virginia University is a land-grant university of approximately 20,000 students with long-time commitment to energy research (over 40 disciplines are involved in energy research at the university). As such, there are many graduate and undergraduate students at the university actively pursuing energy-related careers. The geography program at WVU has about 60 undergraduate majors and 8 master's level students. Many geography majors also design their program around energy interests.

Because of the nature of the university, a new approach to teaching energy geography was attempted. The goal was to bring together students from across the university with a strong interest in energy problems to pursue areas of individual concern subject to peer review. In this way, the approaches and issues defined in a range of disciplines could be related to student's in various disciplines. In addition, research questions and approaches could be scrutinized by others to identify weaknesses, strengths, and innovative design. This type of communication enriches all students.

This approach is used in "The Geography of Energy," by relying upon a "group review process." This process emphasized communication and support among peers in developing and refining research projects. This process was refined at the Science and Public Policy Program at the University of Oklahoma in order to facilitate interdisciplinary research. The format of "group review" process is as follows:

(1) Students, working individually or on joint-projects submit a piece of written work (preliminary prospectus, revised prosepectus, preliminary paper, revised paper etc) as shown in the course outline;

(2) After dividing the class into groups of five students each give students (each group having at least two disciplines represented), copies are made of each students' work and distributed to all members of each students' group.

(3) Students have one week to read, review, and critique these papers in much the same way that an instructor evaluates a paper. The paper provides a forum to bring our ideas and suggestions useful to improve the product;

(4) Students arrive at class, go into their respective groups, and evaluate each paper in turn. Thus, the student's work is evaluated by his or her peers. Evaluation guidelines are distributed to assist students in preparing comments. After each student's paper is evaluated, the student collects written comments from each student and uses these as a guide in revising the work. Students also have periodic meetings with the instructor who provides additional input into the development of term project.

This method fosters communication among the class, helps to improve students writing skill (most students learn to express their ideas clearly and simply), and permits students to draw upon their own areas of expertise in evaluating a proposal written by a student from another discipline. The method serves two other purposes. First, since each student has an opportunity to read and evaluate every other paper in the class (at various levels of development), each student's knowledge about energy problems is broadened. For instance, this semester's class will have students working on such topics as passive solar retrofitting, nuclear power plant siting, biomass energy systems, environmental impact statement decisionmaking, among many others. Instead of having a brief acquaintance with an energy topic by reading a book or preparing for an examination, the students communicate and work with individuals who are sharpening their expertise on such topics ("mini-experts"). The other advantage is that each student, by working on a topic of individual interest, develops a relatively deep understanding of one energy problem.

Few geographers actually do teach at institutions with such a wide variety of energy programs such at WVU. However, even in smaller colleges, energy is of contemporary interest, and energy courses taught by geographers in this way could be successful.

The following material outlines the structure of the course taught at WVU. The first month of the course is designed to make all students familiar with energy problems, technologies, and issues. A fair amount of reading is

required. Each student is to arrive at class with two hypothoses that stem from each chapter read. Students related these to the class which is used as a basis for discussion. This exercise encourages students to read with a purpose and also has them to begin to think of areas of interest worthy of further study.

The second half of the course is structured around the development of individual papers or projects. Joint-authored work is encouraged. In many cases, Masters or Ph. D. students have used this course as a opportunity to develop a thesis or dissertation proposal. Two geography students developed a grant proposal from this class which was funded by the U.S. Department of Energy.

Geography 220
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The prupose of this course is to bring together a group of highly motivated people who have a common interest in desiring to study energy problems. The emphasis of this course is not to cover information on energy, but to allow you the opportunity to investigate an energy problem of interest to you in detail. Your major effort in this course is to be directed toward designing, researching, and writing a paper of publishable quality that deals with an energy problem that is geographical in nature. The class sessions will be used to help you formulate and improve your research endeavor.

An excellent way to rpoduce a quality product is to have your work critiqued at various stages of its development. However, it also helps you if you are given an opportunity to critique the work of others. This will aid both the reviewer who broadens his/her knowledge of others topics and the student whose paper is being reviewed. Thus, students will have primary responsibility for reviewing other students work. I will explain the review process in class. It involves getting copies of your work to me and other students prior to class time for comments, using the class period for review sessions, and incorporating all comments into further work on your paper.

If you wish, you may work with other students on joint-authored works. In order to assist you in getting a project off the ground I have listed a number of deadlines for you to meet. These are outlined below. If you have no idea what you would like to work on, the reading in the first part of the course will help you. As you can see, the first part of the course emphasizes reading to broaden your knowledge and the second part is designed to help you complete your paper.

Session	Assignment Due
Sept. 1	Energy and Social Change Completed (6 hypotheses listed with references)
Sept. 8	Energy in Transition Read Overview (6 hypotheses listed with references)
Sept. 15	"Energy and Economic Myths;" "Forgotten Fundamentals of the Energy Crisis" Chapters 1, 2 Energy Future
Sept. 22	Energy Future Chapters 3,4,5,6, (2 hypotheses per chapter)
Sept. 29	Prospectus Due. Energy Future, remaining chapters (2 hypotheses per chapter) Group Review Session
Oct. 6	Revised Prospectus Due Energy Reference Seminar
Oct. 13	One Paragraph Summary of 6 Documents found from at least 3 different refernce sources. Group Review Session.
Oct. 20	Preliminary Literature Review and Data Discussion Due. Oral Presentation and written Report

Oct. 27	Writing Week
Nov. 3	Preliminary Draft Due. Oral Report on Progre and Problem
Nov. 10	Group Review of Preliminary Draft
Nov. 17	Writing Week
Dec. 1	Rough Draft Due. Oral Report on Progress and Problems
Dec. 8	Group Review of Rough Draft

GUIDELINES FOR PRELIMINARY PROSPECTUS

Due: February 19(next week!)

Don't panic. This is your first chance to try to put on paper your ideas of what you plan to do this semester. In one or two typewritten pages, describe the topic that you are going to address in your research paper, list your research objectives, and the importance of your study. Try to relate it to the reading that we have done so far. On a separate page sketch very rough outline listing the topics that you wish to discuss in your report. Do not worry about being too specific. Finally, list sources that you will draw on in your study.

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Due Thursday, February 21

1. Submit one paragraph descriptions of four articles, books, or government documents which you have read that pertain to your proposed topic. In your descriptions, briefly state how useful the source will be to your particular paper. Write the complete citation for the source described.

2. Critically evaluate the prospectus' for the individuals in your group. Be prepared with general and specific comments. In evaluating the prospectus' consider the following points:

a. Was the prospectus clear in describing the problem that is to be investigated?(if so, you should be able to explain the question of study without difficulity to a third party).
b. Did the prospectus clearly show that this study was important? Does it seem to respond to a clearly stated research need?
c. Did the prospectus make it clear to you how the author was going to attack the topic?
d. Was the scope of the paper clearly defined? Do you think that the author is being overly ambitious?

Be prepared to offer suggestions to the author on how the paper topic can be better focused and more efficiently organized. If possible, provide literature leads(or individuals to contact) to the author of studies that you are aware of that pertain to the proposed topic.

On Thursday the 21st we will break into small groups and each individual will have their prospectus evaluated by others in the group. Be prepared to accept criticism and suggestions on your topic. In the review session remember not to take a defensive posture but rather take the comments as a way for you to improve your paper.

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Assignment due March 5, 1981

Revise your propectus taking the comments that have been given to you into consideration. Concentrate on making the objective of the study as clear as possible. Provide additional justification for the need for the study and provide more information on the conduct of the study. Add more details to your outline and see to it that the proposed organization is sound.

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Task for March 6, 1980

1. Review four additional sources that pertain to your topic.

2. Once you have done this you should have a pretty good idea about what has been written in your topic area. You should know what areas have been well-researched and where the major gaps in the literature seem to be. For next week have a concise(2-3 page typed) literature review ready to be reviewed and discussed by members of your group. Try to get it to them by Wednesday at the latest. Cite the significant studies in your topic area, what they accomplished, and what their findings were. Have complete citations footnoted with the following information:

Author, date. Title of paper or book. Place Published. Publisher, pages.

3. Be prepared to report on data collection activities. Describe any data that you have collected so far, data sources, and data that appears to be fugitive.

A preliminary draft of your paper is due to be reviewed on March 13. This is to be a first attempt to put on paper what your paper is to look like. It will naturally have many gaps and be more speculative than authoritative, but will give you something to work from and something for others to react to.

F.J. Calzonetti
Geography 220
Energy

Guidleines for preparing Preliminary Papers

1. A preliminary paper is due March 13. Arrive at class with 5 copies of your paper.

2. Reviewers will have one full week to read and prepare in depth comments on the preliminary papers. Reviewers will make specific comments on a line-by-line basis and general comments on such things as focus, organization, significance, objectives, etc. The class session of March 20th will be devoted entirely to preliminary paper reviews.

3. Paper should be typed triple-spaced(to provide ample room for comments)and be about 12-15 pages in length. Have complete references either at the bottom of the pages or at the end of the paper.

4. Try to follow your outline. If you have no information on sections or you plan to expand on a section type in "more to be added" where appropriate and continue with the text.

5. Sketch in maps, graphs, charts, and tables that you plan to use. Show where you will be getting the information.

6. If you need data for certain sections that you have not yet collected, state the type of data needed and the likely data source.

7. Don't get writers cramps. If you must,compose the paper at the typewriter.

8. Make appointments to see me after you complete your paper and I have had a chance to read it.

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EVALUATION INSTRUCTIONS

In order to help one another in this course, it is important for you to be as diligent as possible in evaluating the papers you receive. This process may be uncomfortable at first, but quickly becomes easier with experience. As a reviewer keep in mind that a criticism of a paper is not a criticism of the individual. Great people have been known to produce bombs (e.g., has anyone seen Woody Allen's new movie?).

Do not be timid about giving a harsh review. Try to provide suggestions on how a piece of work can be improved. If you do not like an idea, express your position as clearly and as honestly as possible. A vague favorable review is usually less helpful to an individual than one which has specific suggestions that the author can address.

When your work is being reviewed, avoid taking a defensive posture. Note the comments given and try to get as much information on what others think of your work as possible. The more suggestions and details you receive, the easier it will be for you to revise your work.

Address the following questions when reviewing a paper:

1. Is the objective of the study clearly expressed? If so, restate it in your own terms. Exactly what is going to be accomplished in this paper?

2. Does the problem appear to be significant? How does this topic fit into the energy problems discussed in class and in the readings?

3. Does the prospectus seem to indicate that the author is aware of the essence of the problem? What other issues are there on this topic that the author has failed to mention? What readings that you know of should be included in the bibliography of this report. List these.

4. Does the author clearly state how he/she will proceed with the study. Is the framework of investigation vague? Can you suggest ways that the study can be investigated in a more logical manner than the outline that has been submitted?

5. Do the methods of analysis appear to be appropriate? Can you suggest any methods that could be used by the author in reaching conclusions on the topic?

6. Does the author describe the data that will be required in the investigation? What data are needed? Can you suggest useful sources of data?

7. How clearly is the paper written. Suggest ways that the author can improve the presentation of ideas. Go through the paper and rewrite sentences to make them clearer and to eliminate errors.

8. Is the scope of the investigation too broad for a one semester report? How can the paper be focused on a more specific topic?