

Sociological Imagination and Climate Change: An Application of the Richard E. Gross Problem-solving Model

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Abstract

In problem-based learning students cooperate in order to solve a “real world” problem. Such an approach is different from traditional teaching strategies, particularly lectures, where knowledge is transmitted through the teacher. In their efforts to find a solution to the problem, students develop skills in collecting, evaluating, and synthesizing resources. In particular, problem-based learning contributes to students becoming self-directed learners. This paper focuses on the classroom use of a problem-based learning model known as the Richard E. Gross problem-solving model. Following presentation of the steps of the model, the paper aims to show how students could apply the model via answering the question on how Sociology could help in addressing the issue of climate change.

Keywords

problem-based learning, cooperation, sociological imagination, climate change

1. Introduction

Traditional teaching practices, such as lecturing, which involves conveying information without participation of the audience, encourages passivity in the classroom. Passivity promotes memorization [1].

Involving students in problem-based learning means helping them develop higher order thinking skills such as collecting, evaluating, or synthesizing information as opposed to simply recalling it.

Problem-based learning is a pedagogical approach in which problems constitute both the context and the stimulus for learning. In problem-based learning classes, students work together to accomplish a specific task, to find a solution to a “real world” problem. “Real world” problems make it possible for students to connect between past experiences and the problem they are attempting to solve. The teacher becomes a facilitator, supporting students in becoming independent learners and taking responsibility for their own learning [2, 3].

In the face of the challenge of climate change we need to be able to understand the connection between human action and its impact on earth’s biophysical system – which can be called *ecological imagination*. It is also important to be able to see the relationships within society that produce this environmentally harmful social structure. This form of visualization – a central concept in sociology – was first discussed by C.W. Mills (1959) [4]. Mills named the concept *sociological imagination* [5].

Without a sociological imagination, the majority of people in both the scientific community and the general public cannot see the social structure that is around us. And without the ability to see social structure, without seeing the restrictions coming from social structure it is difficult to move forward [5]. As a result of the inability to see social structure, most people can only see their impacts on the planet as individualized consumer actions [6, 7, 5].

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This paper discusses how a problem-based learning model, i.e., the one developed by Richard E. Gross, Stanford University [8] can be used in the classroom. Following a presentation of the steps to be followed, the paper attempts to apply Gross's model via answering the question on how Sociology could help in addressing the issue of climate change.

Other applications of Gross's problem-solving model are those by Manolas [9] in designing a sustainable society, Manolas and Tampakis [10] in having students solve a problem faced by an employee of a toxic-waste disposal company and Manolas [11] in having students construct their own radical environmental philosophy, in particular, their own "deep ecology".

2. The Richard E. Gross Problem-solving Model

Gross's problem-solving model is made up of six steps [8, 12]. It is important to note that the steps are connected and that in the application of the model there is usually natural movement from one step to the next.

Steps in the Richard E. Gross problem-solving model

Step 1. Defines the problem, taking account of societal values

Step 2. Lists the various feasible courses of action

Step 3. Collects and interprets pertinent data

Step 4. Reaches a tentative decision based on the data

Step 5. Acts in accordance with the decision

Step 6. Evaluates the results and modifies future action accordingly

Step 1: Define the problem, taking account of societal values. In deciding the problem to suggest to the class, the teacher needs to determine the suitability of the problem. An important question is whether students will be interested in the problem and if the problem is important enough for the students to devote time studying it. After the presentation of the problem to the class, the students should be prompted to answer questions such as how finding a solution to the problem will be of use to them or how it might impact their daily lives. The answers given by the students are written on the board.

Step 2: List the various feasible courses of action. The second step of the model is to consider possible courses of action that might be appropriate for solving the problem. The use of questions may be useful in the discussion.

Step 3: Collect and interpret pertinent data. The third step of Gross's model is the collection of data. The teacher and students determine the kinds of information needed for solving the problem. Important information for solving the problem may come from practices such as reading, experimentation, interviews, surveys, role plays, student discussion. Following completion of the information needed, the students must determine what types of information are most appropriate for selecting the best course of action.

Step 4: In the fourth step the class reaches a tentative decision based on the information collected. At this stage, the students give answers to questions such as if they are biased in the decisions made and what the consequences of suggested courses of action might be. They also determine which actions are most feasible and which are not so important. At this point, the class is left with a few courses of action. They must now be aware of the reasons for deciding among the choices left. The questions which need to be answered now is if each option will provide a good solution or if it will complicate the situation. The class then arrives at a group decision which may involve a compromise.

Step 5: Act in accordance with the decision. The fifth step is the action part of the model. This step might include the use of community surveys or interviews, doing a play, writing letters to politicians, or designing a video.

Step 6: Evaluate the results and modify future action accordingly. During this final step of the model the students evaluate what they have accomplished and learned and how they might make use of what they learned in the future.

3. Using the Richard E. Gross Problem-solving Model in the Classroom

The following is an example of how the Gross problem-solving model can be used in the classroom.

Step 1: Define the problem, taking account of societal values. The problem chosen and written on the board is the following: How can Sociology help in addressing the issue of climate change?

Following announcement of the problem the following question is put to the students: Why should we engage in such an activity? The discussion of such a question is important for establishing the rationale for such an activity. Following completion of the discussion the class moves to the next step.

Step 2: Lists the various feasible courses of action. Four central questions as reframed by Norgaard [5] with regard to the current interdisciplinary conversation on climate change and the Anthropocene, i.e., “why climate change is happening, how we are being impacted, why we have failed to respond so far, and how we might be able to effectively do so” may be considered such courses of action. In particular:

1. *Why is climate change happening?* Using sociological concepts such as the notion of risk society [13] and treadmill of production [14] how can we see context for both why individuals would fail to understand risks or chose high carbon emissions behaviors? Why is it that the state may be unwilling to put in place economic or political incentives to reduce them? Despite individual participation in these systems, using the concept of social facts [15], how can we explain that individual understandings, values, risk assessments, actions, choices and so forth are critically constrained by their cultural, economic and political contexts?
2. *How is society impacted?* How do class, gender, race, sexuality influence the type and degree of exposure to direct or indirect impacts of climate change? How may climate change (and our various responses to it) indirectly threaten democratic structures when corporate oil interests who benefit from continued high emission scenarios shape policy debates and public opinion? How may climate change threaten collective identity? Ultimately, how may climate change threaten the legitimacy of our economic and political systems?
3. *Why are we not responding more effectively?* How can social context be a significant part of what makes it difficult to respond to climate change? How do relationships between oil company executives and federal governments shape climate policy and public understanding? How in particular political economic contexts, people actually work to avoid acknowledging disturbing information in order to avoid emotions of fear, guilt and helplessness, follow cultural norms, and maintain positive conceptions of individual and national identity?
4. *How might we respond?* Whether and under what circumstances can social movements mobilize citizen engagement and political pressure? In the face of the 2015 Paris agreement, how can communities mobilize to put pressure on city governments, local employers and federal entities? Under what circumstances are people able to move beyond a sense of helplessness, guilt or fear of the future and take actions that are in their collective, long term survival interest? [5].

Step 3: Collect and interpret pertinent data. In this step, students determine what additional information they need in order to better understand the four central questions as presented above. The teacher places the students in small groups with each group covering each of the four questions described in step 2. When the formation of the four groups is completed, the teacher assigns each group various activities with the aim of gathering additional information. The activities that students in each group could do include interviews with other teachers; specialists; and articles they can read about their assigned task. An effective way for the students to keep track of the information they collect is to keep a research log or journal in which they write down what they find as well as theirs or other peoples' comments on the information gathered.

Step 4: Reach a tentative decision based on the data. In this step the groups are reformed so that each group has an expert in each of the four questions described in step 2. Each of these new groups should now produce its answer on the four questions in a text of 400-500 words in length. The text produced by these groups should be presented to the class. The class then discusses the different answers, eliminating ideas that might not work. The basic elements of these answers as they emerge from the discussion are written on the board.

Step 5: Act in accordance with the decision. In this step the students should determine how to carry out the decision they made in step 4. One idea is for the students to produce, as a class now, a 400-500 words text to be posted in notice boards or published in student magazines, the internet or / and sent to other schools.

Step 6: Evaluate the results and modify future action accordingly. The evaluation stage is the key moment in time when deeper learning can happen [16,17]. The type of questions which need be answered during this stage could be:

- In reviewing the text produced by the class, what would you drop, modify, or add? Why?
- What were your most positive and negative learning experiences of the process followed in the activity? What made them so positive or negative? [18]. How did these affect the final result?
- What did you learn from the process? [19].
- What questions does your text raise?
- How feasible are the solutions suggested in the text?
- In what specific ways would your own life change if what is suggested in the text is done?

4. Conclusion

Problem-based learning may promote deeper learning much more than conventional teaching methods such as lectures. It provides students with opportunities to apply sociological theory, promotes teamwork and communication skills. It emphasizes higher order thinking skills, cooperation and self-directed learning and builds citizenship skills. This paper discussed the classroom use of a problem-based instructional model known as the Richard E. Gross problem-solving model. After presenting the steps of the model, the paper attempted to apply the model on the question of how Sociology could help in addressing the issue of climate change.

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