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It's the Method that Counts: Using Case Studies to Teach Science and other Disciplines

WORKSHOP VIDEO OVERVIEW

Workshop Presenter: Dr. Clyde F. Herreid, State University of New York at Buffalo
March 1 and 2, 2012

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Participants in the workshops were from the Rainbow District School Board, Sudbury Catholic School Board, Near North District School Board, Cambrian College faculty, Laurentian University faculty, Nipissing University faculty, and Laurentian University Graduate students and pre-service teachers.

This flyer accompanies the workshop videos.

For more information and to order additional copies of the video, please contact:

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Introduction

Using case studies is one teaching strategy that teachers can add to their repertoire. It is important to shift our focus away from covering the material and more toward students learning. Looking at how much students learn and retain can provide teachers with a starting point when reflecting on their teaching methods. Using case studies can help increase the amount of information that students learn and remember. The following is a brief overview of the workshop on using case studies that was presented by Dr. Clyde Freeman Herreid from the State University of New York at Buffalo. The workshop was made possible by funding from the Ontario Ministry of Education Knowledge Network for Applied Education Research (KNAER) grant. Laurentian School of Education hosted the workshop and the workshop participants came from high schools, colleges, universities and informal science places in Northern Ontario. The overview highlights the following topics that were covered in the workshop: 1) Focus on Learning; 2) What is a case; 3) Types of cases; 4) How to teach analysis and decision cases; 5) How to finish the case; 6) Example of a case. We hope these videos will be a great resource for educators who are willing to try different strategies of teaching that are more engaging and student-centered. The videos can also be accessed through the Laurentian University website via the link provided below.

DVD 1 of 3

1. Introduction: Focus on Learning

What type of teaching brings out the best learning?

In the introduction to the workshop, the presenter emphasized the fact that teachers should focus more on student learning and use teaching methods that lead to the best learning outcomes. The presenter used the learning Pyramid in the workshop to show that the lecture methods of teaching yields the lowest retention rate (5%) among students while more interactive teaching strategies such as group discussion, practice by doing and teaching other yield higher student retention rates (50-90%). The Cone of Learning (Thomas Lord, 2007) shows a similar trend with the lecture method only yielding 4-8% retention rate compared to cooperative learning and teaching another which yield 60-80% and 80-98% respectively. These retention rates were obtained by providing different classes with a puzzle. Each class was taught using the various teaching methods and then tested. The results from this empirical study provide the retention rates shown on the Cone below (Thomas Lord, 2007).

2. What is a Case Study?

The workshop presenter asks participants to share their thoughts with others in at their table about what a case study is. This leads to a discussion where the presenter defined case studies as stories with an educational message. The educational message is the key difference between a case study and story meant only for entertainment purposes (e.g., a comic). Cases can be presented in a variety of formats and taught in a variety of ways, ranging from the classical discussion method used in business and law schools to Problem-Based Learning and Team Learning, with their emphasis on small-group, cooperative learning strategies (National Center for Case Study Teaching in Science <http://sciencecases.lib.buffalo.edu/cs/about/>).

3. Types of Cases: How to Teach Analysis and Decision Cases

In this section the presenter gives an example of two main types of case studies: analysis cases and dilemma cases. Analysis cases focus on an event or an occurrence and can be contemporary (e.g., the hurricane Katrina disaster) or historical (e.g., Tuskegee Syphilis Project). On the other hand, dilemma cases take the learning one step further and consider solutions or remedies to a problem or situation (e.g., a physician's diagnosis and treatment of a patient).

When teaching an analysis case, you should be considering the situation described in the case.

- Who are the characters?
- What has happened or is about to happen?
- Why did the events occur the way that they did?
- Where did the events occur?
- When did the events occur?
- How might the events have occurred differently?

When teaching a decision or dilemma case, you should start with the same analysis that is done for an analysis case. Then you can take it one step further by deciding what action should be taken to solve the problem. These solutions could be short-term or immediate or long-term. In either case, the consequences and risks/benefits should be considered.

4. Example of a Case - Torn at the Genes

The presenter used the case "Torn at the Genes" to demonstrate one way of teaching a case. A copy of the case is provided and it is also available on the National Center for Case study teaching website

http://sciencecases.lib.buffalo.edu/cs/files/torn_genes.pdf

In this workshop, Dr. Herreid led a discussion of the case as if he was teaching a class. This gave the participating teachers the opportunity to experience a case study both from the teacher's and from a student's perspective. The teachers worked in small groups to analyse the characters, consider the issue of genetically modified food, and think about the risks and benefits of producing genetically modified food.

5. How to Finish the Case

There should be some closure in the case: what specific or general lessons have the students learned in the case? There are numerous ways that this can be done: summarize the events, create a poster to show the relevant information, make recommendations about what could be done next, put the events into a broader context that the students can relate to, finish with a question and encourage the students to think about an answer, ask a student or groups of students to summarize the case, or simply end the class.

DVD 2 of 3

1. Teaching strategies in large classes

In this section of the DVD, the presenter leads a discussion focused on addressing issues related to using the case study method to teach in large classes. Dr. Herreid asked participants to share their thoughts and challenges of facilitating case studies in large classes. Tips for handling class discussions such as using students' names and using sitting charts were provided by the presenter. However, he acknowledges how hard it is to use these strategies in large classes and asked participants to share their ideas and concerns. Several ideas were provided by participants who draw from their own experiences of teaching large classes. In this section you will find some useful ideas shared by the workshop participants focused on: grading participation; types of evaluation; grading case studies and more.

DVD 3 of 3**1. How to teach a Case using the Interrupted Method:**

Example of case: “Mom always liked you best”

In this section Dr. Herreid presented a second case that explores the scientific method and demonstrated how to teach an interrupted case where students are presented with limited information and given the chance to do further exploration and develop their own ideas before they are presented with more information. A copy of the case and the information provide to students is included in this package. The case can also be found on the National Center for Case studies website <http://sciencecases.lib.buffalo.edu/cs/files/coots.pdf>

2. How to write a Case

In the final part of the workshop the presenter led a discussion on the characteristics of a good case and went on to provide examples of how to write cases. The participants were given the chance to develop their own cases. In this section you will learn about ideas of cases that were developed by participants from different fields and how these cases can be used.

You can access the video online on the Laurentian University School of Education website:

http://www.laurentian.ca/Laurentian/Home/Departments/School+of+Education+English/Research/CS_and_PBL_Post-Workshop.htm?Laurentian_Lang=en-CA



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