

Activity



Does Africa Have a Future?

Activity developed at Cégep de Ste-Foy
By **JEAN-PIERRE SABOURIN**

Award-winning activity in the *Getting Off the Beaten Path 2001* contest, organized by the Saut quantique in collaboration with Merck Frosst and the Quebec Order of Engineers

Does Africa Have a Future?

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Scientific Discipline

Biology

Average Age of Students

18-19 years old

Course Title and Number

**Evolution and Diversity of Life
(101-NYA-05)**

Duration of Activity

2 weeks (4 fifty-minute periods)

NOTE

In this document, the masculine is used without discrimination and solely to make the text easier to read.

Appendices are available in PDF and Word format on the CD provided with this document.

In addition, an instructional analysis of the activity is available in the pedagogical treasures section (*Trésors pédagogiques*) on the Saut Quantique Web site at:

<http://www.apsq.org/sautquantique>.

Use of this text is authorized for instructional purposes, provided that author's name and college are mentioned.

Adherence to these recommendations will encourage authors to share their experience.



Does Africa Have a Future?

Description of Activity

OVERVIEW

The activity is part of the second biology course offered in the third term of the *Arts and Sciences* program.

Two articles published in *Scientific American* in May and June 2000 serve as a springboard for this scenario.

During the assignment sessions, the group of 21 students is divided into four smaller groups of experts. These groups participate in a simulated international conference on the AIDS epidemic in Africa, like the one held in South Africa in the spring of 2000.

Representatives of the World Health Organization (WHO) discuss how this terrible disease has evolved worldwide. **Scientists** from the biomedical field explain how the HIV virus functions and how the disease evolves. **Representatives of the pharmaceutical industry** present the various antiretroviral drugs that they manufacture, the advantages and disadvantages of tritherapy and their efforts to develop a vaccine. Finally, representatives of **non-governmental organizations (NGOs)** describe the situation in Africa, the means that have been put in place to halt the progression of the disease in Africa and the problems encountered.

After this hour of presentations, the groups of experts must write a joint declaration of two to five pages to confront this dramatic situation, while taking into account the interests and limitations of each group.

RELEVANCE AND ORIGINALITY OF ACTIVITY

This activity is part of a massive trend in educational innovation in the Natural Science program¹. It aims more specifically at moving the teaching of science away from academics and focusing more on teaching students to use their previously acquired knowledge and the scientific approach. The aim of this trend is to lead students to better confront “real-life” problems.

This activity encourages students to take an active role in their learning, to apply the scientific process in teams when carrying out their investigations and to synthesize their results. They will have to call upon their knowledge and experience. Like members of the scientific community, they will have to write a report and defend their points of view to their peers in order to reach a consensus (Waterman, M.A., 1998²).

¹ For more information, visit the Web site of the University of Buffalo at <http://ublib.buffalo.edu/libraries/projects/cases/case.html>.

² For more information, you can view the PowerPoint presentation on the educational approach used for this activity at <http://ici.cegep-ste-foy.qc.ca/profs/jpsabourin/cas.htm>

³ Quebec Department of Education, description of the *Science* program, 200.B0 (1998), on line at <http://www.mels.gouv.qc.ca/ens-sup/ens-coll/Cahiers/program/200B0a.pdf>

Objectives and Relation to the Program

PEDAGOGICAL OBJECTIVES OR TARGETED COMPETENCIES

This activity targets three competencies of the *Science* program:

- To make connections between science, technology and social progress;
- To define their personal system of values;
- To apply what they have learned to new situations.

It should be noted that these three competencies are also part of the new *Science* program.

LINK BETWEEN THE ACTIVITY AND THE PROGRAM

General Program Goals Targeted

A major aim of the *Arts and Sciences* program is to enable students to apply their learning to the following four areas: sciences, social sciences, creative arts, and languages and literature. A case study, like the one on AIDS in Africa, enables students to apply what they have learned in various disciplines to problem solving. Statistics available in the form of tables and graphs make it possible to analyze how the epidemic is evolving throughout the world. The stages of reproduction of the virus and the modes of action of the antiretroviral drugs point to the importance of understanding molecular structure. Biology combines various aspects ranging from prevention to the difficulty of developing an effective vaccine.

Students compare the lifestyles in developed and developing countries to explain the slow-down in the number of AIDS cases in Northern countries and the rapid progression in Southern countries, especially in Africa. This North-South

⁴ You can, for example, draw inspiration from my Web site at <http://ici.cegep-ste-foy.qc.ca/profs/jpsabourin/afrique.htm>.

dimension becomes even more significant when they analyze the various initiatives (prevention, testing, drugs, vaccines, etc.) and the costs involved. They must call upon their knowledge of international business and the issues surrounding intellectual property.

Link with Course

This activity enables students to apply their knowledge of the immune system to a current problem.

Link with Other Courses

This activity takes into account the knowledge acquired in previous biology, chemistry and mathematics courses. It also incorporates knowledge acquired in previous sociology and economics courses dealing with issues of globalization. Moreover, students can appreciate the difficulties of developing effective technologies and making them accessible to populations in need, given issues surrounding North-South relations.

Number of Students and Educational Support

APPROXIMATE NUMBER OF STUDENTS IN CLASS

About 21 students

NUMBER OF STUDENTS PER TEAM

5 or 6 people

EDUCATIONAL SUPPORT

The case study on AIDS in Africa requires that the teacher read the suggested documentation for each of the teams and summarize it (six hours)⁴. It is also important to follow current events regularly to stay apprised of any new developments. The teacher can choose to collect a series of documents for each group of experts. He can also design a Web page dedicated to the case (four hours). This approach offers several advantages: it lowers costs for students and



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provides access to the most recent and thorough information on the subject.

Conducting the Activity

CONDUCTING THE ACTIVITY AND TIME REQUIRED TO COMPLETE EACH STEP

Before

Does Africa Have a Future? is carried out over a two-week period. During the first week, the teacher presents the case of an African woman undergoing tests for AIDS in a clinic (see Appendix S.1), in an effort to arouse students' interest. The teacher clarifies the role of each group of experts, the work to be handed in the following week and the framework for the oral presentation. Teams are created at the beginning of the semester, given that there are several cases to study, one for each section of the course.

On average, students have two hours of reading and one two-hour team meeting to prepare their oral presentation. They are not required to do a literature search since references are suggested in the Student Learning Guide (Appendix S.1). A literature search could, however, be incorporated into the procedure if the activity is extended over a four-week period.

Since the skills involved in effectively carrying out a literature search are developed in the early courses of the program, this activity focuses on the skills involved in writing synopses and developing oral, written and critical thinking skills.

During

The following week, the two hours set aside for assignments are devoted to the case study. In the first hour, each of the groups does a 15 minute presentation. The presentations are followed by a short question period. The teacher can take this opportunity to highlight any points that have been overlooked.

After

In the second hour, the teacher has each group of students write a joint declaration. This often results in protests about the assignment's feasibility. The teacher can make certain suggestions about how to proceed. Most groups manage to quickly organize and write the text of two to five pages within the allotted hour.

Evaluation and Required Material

This activity is marked out of 10. Marks are distributed as follows:

- **5 marks** for the synthesis document by the group of experts:

Evaluation criteria:

- Synthesis of main elements;
- Presentation;
- Language quality.

- **3 marks** for the oral presentation:

Evaluation criteria:

- Effectiveness and originality of the presentation;
- Oral communication.

- **2 marks** for the joint declaration:

Evaluation criteria:

- Synthesis of main elements;
- Relevance and feasibility of recommendations;
- Language quality.

This total score counts for 10% of the semester.

This activity should also be evaluated by means of a question during the next theory exam. This second evaluation encourages students to be attentive and to take notes during other student presentations.

REQUIRED MATERIAL

The teacher develops a literature file, which he updates regularly. It contains articles from such magazines as *Pour La Science*, *La Recherche* and *Scientific American* (see the references for each group of experts in the Student Learning Guide: Appendix S.1). These references are divided according to each expert's role. An additional list of links can serve to develop a Web page on the case study .

Students obtain their learning guide (Appendix S.1: Student Learning Guide), which includes:

- A description of the case study;
- The scenario;
- The objectives to be achieved;
- The role of each group of experts and the references to be consulted;
- The procedure for the activity;
- The main articles in print and on the Internet.

APPENDICES

Students

Appendix S.1: Student Learning Guide

Note:

Appendices are available in PDF and Word format on the CD provided with this document.

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Other Ideas to Explore

This type of activity could also apply to other human and animal diseases such as cholera, malaria and mad cow disease.

MEDIA DIRECTORY

See the Appendix for a list of references for each group of experts.

⁵ See <http://ici.cegep-ste-foy.qc.ca/profs/jpsabourin/afrique.htm>



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