United Nations Illiteracy in America: Thoughts on Integrating the United Nations Into the Science Curriculum

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Abstract

To provide an international perspective, and to get American students focused on the United Nations (UN) as a legitimate scientific institution, the United Nations and its role in addressing global environmental concerns should be taught in the American science classroom. The target audience for this paper is high school teachers. The United Nations is a huge organization, and an associated curriculum is not easily broken down into manageable lessons. There is a lack of pedagogical research on the use of the United Nations in the science classroom. I have provided instructional techniques on how to present a Model UN in the science classroom, as well as information on how to go about developing a lesson on the UN.

In this paper, I would like to outline a strong need to engage American high school students in meaningful discussions concerning the relevance, function, and necessity of the United Nations (UN). I believe this subject matter, which is traditionally in the history/geography realm, should be integrated into the science classroom. The reasons are many. The world has serious environmental, health, and population concerns that adhere to no national boundary and that are in need of earnest study.

We need Americans, in support of the United Nations, to join a greater fight against many problems: disease, scarce waters supplies, global warming, nuclear proliferation, and declining fish stocks worldwide, to name a few. At issue, however, is overcoming America's general lack of knowledge and ambivalence regarding the United Nations, now 58 years after it's founding.

This paper is addressed to life science teachers at the high school level. It outlines a need to integrate the United Nations into the science classroom. I wish to demonstrate what a vibrant United Nations does with science knowledge, and provide examples on integrating the United Nations into teachers' lessons.

Science Educators Need to Know Where to Start

In the world today, there are too many global problems for America to sit on the sidelines or attempt to conquer alone. Attempting to solve global problems separately, or non-holistically, or imposed from above, will not lead to lasting solutions (Myers, 1999; Sachs, 2002). My review on the United Nations as a topic being taught in the United States science classrooms showed a paucity of pedagogical research. I find this want of research surprising because the United Nations has, under its umbrella, thousands of scientists aiding its efforts on subjects ranging from biodiversity to global warming (Bolin, 1998; Myers, 1999; National Research Council of the National Academies, 2002; Raustiala & Victor 1996). Among the research papers, related to the UN and education, that I was able to find was Kastenholz and Erdmann (1994).

I found papers on the Model United Nations in the social science classroom (McIntosh, 2001; Morton, 2002; Muldoon & Myrick, 1995; Phillips & Muldoon, 1996; Travis, 1994). I also found papers on the United Nations and sustainability in the classroom (Mahmoudi, 2001; Wakefield, 2003). Still, my review did not reveal much on the United Nations for the science classroom--and especially in the teaching journals. I believe one of the reasons that the United Nations does not capture the attention of academics and teachers is that the United Nations is vast in size, and this makes it difficult to filter out lessons for the classroom. Furthermore, some scientists find it difficult to reconcile science knowledge with the international decision-making process (National Research Council of the National Academies, 2002).

If we are to solve our most pressing global environmental problems, we must require our students to not only have a scientific literacy, but a global literacy with an interdisciplinary perspective. The National Geographic Society (2002) reported that only 1 in 7 Americans, aged 18 to 24, could find Iraq on a map. Further, only 51% could find the state of New York, and just 71% could find the Pacific Ocean. A lack of geographical knowledge hurts our science knowledge. As John Fahey, president of the National Geographic Society, similarly notes: “If our young people can’t find places on a map and lack awareness of current events, how can they understand the world’s cultural, economic and natural resources issues that confront us?” (National Geographic Society, 2002, p. 1).

There are so many “avenues” one can take when trying to describe, to American high school students, the place and role of the United States in the world today. The United States is unsurpassed in wealth creation, unsurpassed in technology, unequalled in military power, and unsurpassed in our export of culture through movies, music, and fast-food chains. Yet, with all these achievements, our youth seem to be too culturally self-absorbed to take on the challenge of global cooperation. This is a perilous mind-set, and not good for the rest of the world. American students need to understand that the United Nations has to be given an equal partnership in world affairs.

How the United Nations Uses Science

It should be clear to science teachers that the United Nations has consent from its charter for integrating scientific advice (National Research Council of the National Academies, 2002). The United Nations has a mandate, under Article 99 of the UN Charter, which allows the Secretary-General to alert governments to new concerns that are relevant to international cooperation and science issues (National Research Council of the National Academies, 2002). The Secretary-General may bring to the Security Council those matters that affect peace and security and, with this power, access to scientific advice is required. Through Agenda 21, under the United Nationals Conference on Environment and Development, member states are called upon to provide and strengthen scientific knowledge for sustainable development.

From where does the United Nations get its scientific advice? The United Nations uses the advice of national academies, consultants, and committees of scientists working directly for the United Nations. The Intergovernmental Panel on Climate Change (IPCC) has some 700 scientists that write its reports, and another 700 scientists that review them. The United Nations Education and Scientific Organization (UNESCO), an independent UN body, serves as a center for analysis and a clearinghouse of scientific information. The constitutional preamble of UNESCO states that there will be “full and

equal opportunities for education for all . . . the unrestricted pursuit of objective truth and . . . free exchange of ideas and knowledge" (UNESCO, 2003).

Scientific advisory mechanisms are found throughout the UN system, but the United Nations, representing the nations of the world, must balance both political agendas and science. This dichotomy of science and politics has been criticized. Among the criticisms of the United Nations use of science has been its excessive weight to geographic issues, its use of a select number of consultants for scientific information, and, in a few cases, a lack of scientific peer review in some committees (National Research Council of the National Academies, 2002).

The IPCC is considered a highly successful model for scientific analysis within an international committee setting. The IPCC relies, for its assessments, on peer-reviewed research from over 1400 scientists. Further, the National Research Council of the National Academies (2002) found that the international and national science advisory bodies of developed and developing countries followed similar principles and practices of giving scientific advice as those of United States academies.

Examples of Scientific Issues and the United Nations

Nothing symbolizes US government disengagement from the United Nations more than the United States withdrawal from the 1997 Kyoto Protocol on global climate change. The US pullout from this agreement was followed by a withdrawal from many other agreements, but the Kyoto Protocol stands out. Students should learn that a majority of scientific data suggests that global warming is already occurring, but that there is some debate as to the amount of the warming and its cause--anthropogenic or natural sources (Bindschadler & Bentley, 2002; Intergovernmental Panel on Climate Change [IPCC], 2001; Mukerjee, 2003; Pegg, 2002; Ramanthan & Barnett, 2003; Root, Parmesan, & Yohe, 2003).

In another instance, botanists in the United States are actively engaged in research on the biology and sustainable harvest of products from tropical rainforests, including Broadleaf Mahogany (*Sweitenia macrophyla*). Broadleaf mahogany is listed under Appendix II of the Convention on International Trade of Endangered Species (CITES). CITES relies on scientific data from non-government organizations including the World Conservation Union, World Wildlife Fund, the World Conservation Monitoring Center, and many other biologists doing individual research on select species (National Research Council of the National Academies, 2002). Despite scientific research showing the decline of this species, it is the policy of the present US government administration not to abide by the CITES listing (Bohlen & Sandalow, 2002).

The United Nations: An Educational Primer for the Teacher

Understanding the "big picture" of the United Nations, especially as it relates to science, is a difficult task. The United Nations is a massive system composed of six principal organs (Secretariat, Trusteeship Council, Economic and Social Council, General Assembly, Security Council, and International Court of Justice) and 191 nation members. There are at least 24 major programmes and funds, 19 specialized agencies, 18 offices and departments under the Secretariat alone, 16 commissions, and hundreds of committees, sub-committees, tribunals, and subsidiary organs. A good

website for teachers to get the “big picture” of the UN System may be found at United Nations (2003a).

Figure 1 lists some of the more practical websites for high school students to use to conduct research.

Food and Agriculture Organization: www.fao.org	Refugees: www.unhcr.ch
Human Rights: www.unhchr.ch	Statistics: http://unstats.un.org/unsd/default.htm
UNESCO: www.unesco.org	Climate Change: http://unfccc.int/
Environment: www.unep.org	Climate Change: http://www.ipcc.ch/
Development: www.undp.org	UN System: www.unsystem.org
UNICEF: www.unicef.org	Treaties: http://untreaty.un.org
AIDS: www.unaids.org	World Heritage Sites: http://whc.unesco.org

Figure 1. Practical UN websites for student research.

There are a minimum 20 databases one can use in the United Nations website (United Nations, 2003d) to research data. If, for example, a student is interested in environmental treaties, she can sort through the United Nations treaty database (United Nations, 2003e). There are at least 463 international environmental treaties and agreements to date. For human population statistics, one can go to the online databases of the United Nations Development Program, World Health Organization, World Bank, or the United Nations Statistics Division, just for starters. A person wanting to study global warming may be directed to the United Nations Development Programme (UNDP), the United Nations Environmental Program (UNEP), the UNFCCC (United Nations Framework Convention on Climate Change), or the World Meteorological Organization (WMO) on the World Wide Web. There are over 700 world heritage sites, many housing unique biodiversity that can be researched under UNESCO. Given the huge volume of data available, it is easy to see why the United Nations can quickly become too unwieldy for use in the classroom.

The Model United Nations in the Science Classroom

There is one precedent for teaching the United Nations in American classrooms, and that is the successful Model United Nations used in the social science classroom, or as an extra-curricular or co-curricular activity (Muldoon & Myrick, 1995). Annually, more than 60,000 students from 2,000 middle schools, high schools, and colleges in the United States participate in the Model UN through role-play situations. In the model, students are assigned roles representing the ambassadors of UN member states and then seek resolutions to global problems on the UN agenda. Through cooperation, negotiation, and debate, students are challenged on many levels. The high levels of cognitive learning outcomes from such role-play sessions are highly regarded (McIntosh, 2001; Morton, 2002; Muldoon & Myrick, 1995; Phillips & Muldoon, 1996; Travis, 1994). I am suggesting a similar model here called the Model UN in the Science Classroom.

A representative topic for our science class Model UN is the Convention on Biodiversity of 1992 (Secretariat of the Convention on Biological Diversity, 2002). This exercise takes approximately two 1-hour class sessions and students must prepare their position papers several days in advance. The goals of the exercise are to learn about the many aspects of biodiversity, the access to biological and

genetic resources by other countries, and the provision for the protection of indigenous property rights. Students will also learn how to negotiate, make speeches, debate, and cooperate. As shown in Figure 2, the objectives of the exercise include writing a three-page position paper, articulating a well thought out position, and describing the main provisions of the convention.

Convention on Biodiversity of 1992

1. Students receive handouts on the Biodiversity Convention.
2. Students prepare a three-page position paper several days in advance.
3. Students choose a country. Class is divided up evenly into developed and developing countries.
4. Meetings are chaired by one of the states.
5. Decisions take the form of resolutions, if one is possible.
6. The topic is placed on the UN Agenda.
7. Students break up into regional caucus groups, based on their positions, and discuss the finer details of the impact of the convention on their country.
8. Students make formal statements to the UN Assembly.
9. Students negotiate in the hallways on an informal basis.
10. Resolutions are passed by a simple majority.
11. Debriefing

Figure 2. Format for organizing a Model UN in the Science Classroom (adapted from McIntosh, 2001).

Teachers should break down the United Nations into manageable units. Pick a subject that they are interested in and find an agency, program, department, or convention in the UN that addresses the problem. Figure 3 provides some themes I recommend for individual lessons.

Challenges to Integrating the UN into the Science Curriculum

We cannot easily integrate the United Nations into our curriculum without first addressing certain concerns about the United Nations. First, we have current media events that portray the UN in a confrontational manner, especially in relationship to the United States government. Second, there are state and local school boards with specific curricula and standards to deal with. There may be excessive nationalism (defined here as devotion to the interests or culture of a particular nation), that is emotionally-charged and does not support the foundations of science or instill global cooperation. I have mentioned previously in this report some concerns regarding the mixture of science and politics in the UN. Finally there may be concerns about perceived loss of sovereign liberties by being associated with the United Nations. But these challenges are minor when one considers the risk of failing to tackle our crucial world problems as a team. In teaching about the United Nations and the environment, teachers must “walk a tightrope” between science and values laden with politics, nationalism, and environmental advocacy. There is always a question on how far to push

environmental issues. As Jickling (2003) noted, environmental educators need to be able to distinguish between environmental education issues and environmental advocacy in the classroom.

- An Overview of The United Nations Framework
- The United Nations Environmental Program (UNEP)
- Sustainability and the United Nations
- Malaria and The World Health Organization
- The Kyoto Accord and the United Nations Framework Convention on Climate Change
- The United Nations Convention on the Law of the Sea
- The Convention on Biological Diversity

Figure 3. Potential science lessons for the classroom.

The United Nations: Talking Points for the Classroom

The United Nations does an immense job on its limited resources. In the classroom, the teacher may illuminate the UN accomplishments shown in Figure 4 as a background to the multiple roles of the UN (United Nations, 2003c).

The cost for these phenomenal numbers is about 12 billion dollars a year from all of the countries of the world. There may be smaller additional cash contributions by countries during emergencies, but the basic fact is that the United Nations does a lot on a little. By contrast, Adelman (2003) puts the official development assistance (ODA) from the United States to the rest of the world during 2002 at 9.9 billion dollars. In 2001, the United States allocated 11.4 billion dollars for its ODA worldwide (World Bank, 2001). The United Nations does an immense job on its allocated finances, with its millions of beneficiaries and projects spread over hundreds of thousands of square kilometers of the earth's surface. The human productivity coming out of the UN staff might be considered a cheap investment to keep the world's population healthy and fed, and our ecosystems intact. In fact, it is probably the best bargain in the history of mankind. The teacher can provide these or comparable numbers when contrasting the United Nations budget.

The United Nations excels in defining and practising sustainability. On a daily basis, the organization addresses hundreds of problems through the lens of sustainability (Annan, 2002). American students need to know that the environment is finite and that there are many reasons to be concerned that the

global ecosystem has become strained (Goodland & Daly, 1996). A good formula that can be readily grasped by students is I = P x A x T (Ehrlich & Holdren, 1974). The impact (I) of any population (P) is a result of the size of its population, its level of affluence (A), and the particular technology used (T). The United Nations is a good start for talking about scarce natural resources and consumption habits. For help in focusing on solutions, citizens of the world must look to the idea and practice of sustainability. Sustainability takes the best of social, renewable economic and ecological principles and blends them into a workable framework for solving problems. A lesson in sustainability should start with a definition. Among the many definitions of sustainability is this one: meeting the needs of the present without sacrificing the needs of future generations; living within the carrying capacity of the environment; community-centered development; and development that addresses consumption, population growth, and appropriate technology (Wright & Nebel, 2002). When the United Nations enters into an agreement with a community or a country, its emphasis is on long-term sustainability. The United Nations Convention on Biological Diversity of 1992 mentioned previously is an example of such long-term thinking.

- #1 in vaccinating the world's less developed nations' children (saving 3 million lives annually).
- #1 in fighting AIDS in the World.
- #1 in world food aid.
- #1 in eliminating disease (smallpox is gone and polio is on its way out).
- #1 in refugee food and shelter assistance (currently serving 25.7 million).
- #1 in environmental protection and problem solving.
- #1 in natural disaster and war assistance.
- #1 in human population planning.
- #1 in global warming and ozone depletion research.
- #1 in world statistics and demographic data generation.
- #1 in peace-keeping.

Figure 4. Accomplishments of the United Nations (adapted from United Nations, 2003b)**.**

Inspiring International Science Careers

Educators teaching the United Nations in the classroom can provide American students with a working knowledge of the UN, which could be valuable in any international endeavor. Operational knowledge of the United Nations would allow Americans to critically analyze legitimate UN concerns on their own. A high school or college science teacher could council a career as a crop breeder with the CGIAR (Consultative Group on International Agricultural Research), as a pathologist with the World Health Organization, as a forester with the Food and Agriculture Organization, or as a biologist with UNEP. The number of people employed worldwide by the UN, in all capacities, is some 61,000. Hundreds of Americans currently work for the UN, but hundreds more are needed. Hundreds of scientists from American universities contribute crucial data to the UN on ozone thinning, global warming, and drought because it is in their own interest. Scores of Americans work as UN volunteers

around the world under the United Nations Volunteer program (UNV) teaching at universities, managing nature preserves, or administering to refugee needs, among others.

Conclusion

In this paper I have addressed the idea of solving global problems, through the auspices of the United Nations, in the American science classroom. There is not a precedent for teaching about the United Nations in the science classroom and this was reflected in the lack of pedagogical research on this important topic. Using the Model UN, I have developed a format for presenting the United Nations. I have presented some talking points on what the United Nations does, it's accomplishments, and it's framework.

If the United Nations failed today, what would replace it? Would smaller countries be held at gunpoint, by larger nations, for their natural resources? Would the world's flora and fauna have any protection at all? Would there be any framework for addressing the global warming or ozone thinning problems? These questions demand American student involvement in the United Nations. These questions require Americans to have a basic literacy about the United Nations.

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