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ABSTRACT

To prepare students for the 21st century, students must be taught not only how to think, but also to think from a global perspective. As an extension of the Sister Schools Project of Dade County, Florida, this practicum centered on developing a Moscow-Florida, cross-cultural educational linkage between a school in Moscow, Russia, and a middle school in South Florida. Dealing with shared environmental concerns, Moscow and Florida teachers collaborated to develop curriculum resources, strategies, techniques and activities to identify common global environmental concerns and to find possible solutions to these concerns. A major joint identified concern was the effect of global ecological imbalance on human health and disease. Educators from both schools engaged students in the cognitive processing skills of critical and creative thinking and in exploring the affective areas of attitudes, feelings and values. After inservice training on the teaching strategies of critical thinking and creative thinking skills, Florida teachers demonstrated a 21 percent increase in the actual teaching of these skills. While unable to establish an on-line telecommunications system between the sister schools, the sharing of ongoing correspondence was accomplished through the conventional methods of letter writing, faxing, telephoning, and personal delivery from persons traveling between the two countries. The results of this sharing and research were videotaped in an Earth Summit simulation and a jointly produced newsletter which included results of community surveys, creative writings, cultural art, pen friend correspondence and research results. The significance of this practicum resulted in the implementation of a project among educators from two diverse cultures which demonstrates that mutual respect and understanding can be established by working on a common concern. Seventeen appendices include questionnaires and survey results. (Author/MDH)

# ESTABLISHING A MOSCOW-FLORIDA MIDDLE SCHOOL CROSS-CULTURAL LINKAGE FOR GLOBAL ENVIRONMENTAL COLLABORATION

by

Suzanne Dee Nix

A Practicum Report

Submitted to the Faculty of the Center for the Advancement of Education of Nova University in partial fulfillment of the requirements for the degree of Master of Science

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# Abstract

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To prepare students for the twenty-first century, students must be taught not only how to think, but also to think from a global perspective. As an extension of the Sister Schools Project of Dade County, Florida, this practicum centered on developing a Moscow-Florida, cross-cultural educational linkage between a school in Moscow, Russia, and a middle school in South Florida. Dealing with shared environmental concerns, Moscow and Florida teachers collaborated to develop curriculum, resources, strategies, techniques and activities to identify common global environmental concerns and to find possible solutions to these concerns. A major joint identified concern was the effect of global ecological imbalance on human health and disease. Educators from both schools engaged students in the cognitive processing skills of critical and creative thinking and in exploring the affective areas of attitudes, feelings and values. After inservice training on the teaching strategies of critical thinking and creative thinking skills, Florida teachers demonstrated a 21 percent increase in the actual teaching of these skills, as evidenced by a pre- and post-implementation survey. While unable to establish an on-line telecommunications system between the sister schools, the sharing of ongoing correspondence was accomplished through the conventional methods of letter writing, faxing, telephoning, and personal delivery from persons traveling between the two countries. The results of this sharing and research were videotaped in an Earth Summit simulation and a jointly produced newsletter which included results of community surveys, creative writings, cultural art, pen friend correspondence and research results. The significance of this practicum resulted in the implementation of a project among educators from two diverse cultures which demonstrated that a mutual respect and understanding can be established by working on a common concern.

## Authorship Statement

I hereby testify that this paper and the work it reports are entirely my own. When it has been necessary to draw from the work of others, published or unpublished, I have acknowledged such work in accordance with accepted scholarly and editorial practice. I give this testimony freely, out of respect for the scholarship of other professionals in the field and in the hope that my own work, presented here, will earn similar respect.

Signed: Suzanne Dee Nix
Suzanne Dee Nix

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# CHAPTER I

## Purpose

Model School A is located in South Florida on the east coast. The surrounding community consists of middle income families. Model School A is a middle school with grades ranging from sixth through eighth. It has a population of 1,179 students feeding in from eight elementary schools. There are 420 sixth graders of whom 201 are females and 219 are males. The seventh grade is comprised of 400 students of whom 188 are females and 212 are males. The eighth grade is comprised of 359 students of whom 194 are females and 165 are males. The ethnic breakdown of the student body is as follows: sixth grade: Black - 138, Indian - 2, Hispanic - 60, Asian - 12, White - 213; seventh grade: Black - 77, Hispanic - 54, Asian - 12, White - 230; eighth grade: Black - 77, Indian - 2, Hispanic - 52, Asian - 10, White - 218. The total percentage breakdown by ethnic group at Model School A is: Black - 27.1 percent, Indian - 0.3 percent, Hispanic - 14 percent, Asian - 2.5 percent, White - 56.1 percent. As shown by the figures, 44 percent of the students are minorities. This is an increase of 10 percent over the past five years.

The socioeconomic background of the students and their parents shows that approximately 25 percent are classified in the higher income bracket, 55 percent

in the middle income bracket, and 20 percent in the lower bracket. Fifty percent of the students are on free or reduced lunch. Being in a tourist area, there is a high rate of transient families.

Model School A has a staff of 83 employees. This consists of the principal, three assistant principals, one guidance director, one middle school coordinator, 59 faculty members, nine secretaries, four aides, six custodians, and nine cafeteria workers. The 59 faculty members are broken down into 36 females and 23 males with eight being Black, one Hispanic, and 50 White. The faculty is young in age and experience with 50 percent being annual contract or interim teachers. Advanced degrees are held by 23 percent of the faculty with another 12 teachers currently working towards advanced degrees.

The school is a "Red Carpet" school with several programs to enhance the growth of the middle school child. In addition to the Basic Education Programs, the following Exceptional Programs are taught: ESE cluster consisting of Physically Handicapped, Speech/Hearing (Part-time), Emotionally Handicapped (Part-time), Specific Learning Disability, and Gifted (Part-time). Other special remedial programs consist of Mainstreaming Support, Dropout Prevention, SOAR (Success Orientation Academic Resources), Transition Six, and Transition Seven-Eight. The average number of students in the special classes is 20. The regular classes average 32 students.

Model School A has made great strides in strengthening school/community involvement. It has two Partners-in-Excellence who support both students and

staff throughout the year. Some of these activities include funding for the special awards given to students at the Science and Renaissance Fairs, a breakfast for our Honor Roll students and special recognition given to the teacher/employee of the month. The school's volunteer program has expanded with individuals from the community who assist in all phases of the curricular program. Career Day has received an incredible response from the community with over 75 professionals participating. Awards Night has greatly been enriched by the many local community organizations; such as, the Optimist Club, American Legion, and Masonic Lodge, who become actively involved in recognizing students' achievements.

Pilot programs have played a very important role in the school's activities. Last year, both teachers and students participated in seven pilots. These pilots were: Afro-American Infusion, Substitute Finder, I.P.A.S. (Instructional Performance Assessment System), A.L.P. (Adolescent Language Program), Articulation, Dropout Prevention, and Advisor/Advisee. This year, Model School A is involved in "Blueprint", a career education pilot program. The Advisor/Advisee (Prime Time) is now an integral part of the school's instructional program. Prime Time helps to instill in the students a positive self-esteem.

Each grade level is divided into two teams. Each team has a team leader who coordinates the activities of the team. Interdisciplinary units are written by the teams and are taught a minimum of twice a year. Stressed to be included in teachers' plans are cooperative learning activities and study skills. Team leaders

and department chairpersons have been inserviced in both cooperative learning and study skill strategies. They, in turn, have inserviced their respective teams and departments. In addition, teachers attend E.S.O.L. classes and view tapes to help them teach the LEP (Limited English Proficient) student. These strategies are incorporated in daily lessons being taught.

The school's site consists of five loggias with 43 classrooms and 12 portables. Due to construction of a new school just east of the present site, four classrooms, gym, and locker rooms have been dismantled to make room for the new structure. This has created definite challenges. For example, several teachers must travel to and share rooms; gym activities have been curtailed; and science laboratory activities have been limited, due to the disconnection of water and gas in the laboratory.

The writer of this proposal is a classroom teacher with a total of twenty years' experience of which twelve years have been at Model School A. Six classes are taught each day with each class being 58 minutes in length. These classes consist of one 8th grade gifted science, one 6th-7th gifted science, and four regular 8th grade science. In addition, the writer also functions as science department chairperson. The science department consists of seven full-time teachers, and six teachers teaching a minimum of one period a day in the dropout prevention, transition 6 and transition 7-8 programs. In this capacity, as a department chairperson, included are: checking teachers' lesson plans, conducting department meetings, attending county meetings, assisting teachers in curricula, and

maintaining equipment and supplies, which are all major responsibilities.

With the crumbling of the Soviet Union in August 1991, the news media and journals have focused heavily on the economic, political and environmental turmoil in what is now the Commonwealth of Independent State (CIS). As a result of this, educators and environmentalists in Florida have become very interested in the educational and environmental problems in Russia, the former Soviet Union. In June 1992, educators from South Florida, including this writer, attended a conference in Moscow on "Non-violence in Education," which was sponsored by the (CIS) movement, "Educators for Peace and Understanding." The aim of the movement was to contribute in uniting educators to achieve the goal of "creating a new thinking that realizes the unity of interdependence of the world, capable of living in harmony with nature, nations and people" (Educators for Peace and Understanding, 1988:1). Sponsored by the movement's chairperson, Mikhail Kabattchencko and coordinated by Vjacheslav Siapov and Elene Istomina of Moscow Pedagogical University and Fran Winfrey, Dade County (Florida) Schools, several schools in Moscow and Russia were linked with more than 100 schools throughout the state of Florida. This grass-roots program was called the Florida/CIS Sister Schools Project. The purpose of this linkage was to establish a cross-cultural networking and sharing of educational ideas focusing on global thinking and global problems. While attending the conference, this writer gave a presentation on global thinking and how it could be incorportated in the learning and understanding of global environmental

problems. The response from the Russian educators and students was overwhelmingly positive. Questions were asked as to what resources and references were used in the presentation and how they could be obtained. They asked about the plans for doing additional research and the writing of curricula. The request to "please share and correspond" was heard from all Russians in attendance. Environmental concerns predominated the conference, both in general conversation and presentations. It became obvious from the Russian response that there was a definite need to further explore global thinking and global environmental problems and solutions.

At Model School A, the American faculty was surveyed and asked to respond to general statements pertaining to the environment and mankind. These statements, developed by Dr. Simon Vershlovsky from the Academy of Pedagogical Sciences, St. Petersburg, and used in the U.S.-Soviet Global Thinking Project, were stated so that teachers could respond by using (1) if they agreed with the statement, (2) if they found it hard to say, and (3) if they disagreed. Of the 28 teachers who responded, the results showed that while many of the responses were in agreement, several of the responses ranked as being uncertain. Table 1 below shows the statements and the numbers of teachers who responded and the corresponding percentages of each.

Table 1

Faculty Responses to Environmental Concerns

| | | Agree | | It's Hard to Say | | Disagree | |
|---|---|---|---|---|---|---|---|
| | | # | % | # | % | # | % |
| 1 | To make the world better, people must start with themselves. | 28 | 100 | | | | |
| 2. | A person should use all the natural resources available during their lifetime and not worry about changing their lifestyle by saving such resources for future generations. | 2 | 7 | 1 | 4 | 25 | 89 |
| 3. | I try not to think about my future because everything will be taken care of by itself. | 3 | 10 | 1 | 4 | 24 | 86 |
| 4. | To build new nuclear plants mean to create "ecological bombs." | 5 | 18 | 15 | 57 | 7 | 25 |
| 5. | The majority of people are inclined to think more of themselves than to help others. | 24 | 86 | 4 | 14 | | |
| 6. | The day will come when the borders between countries will be abolished. | 5 | 18 | 10 | 36 | 13 | 46 |
| 7. | People of different cultures and traditions can hardly be expected to get along together. | | | 4 | 14 | 24 | 86 |
| 8. | Economic resources are not equally distributed between different nations. | 22 | 79 | 4 | 14 | 2 | 7 |

Table 1 (continued)

Faculty Responses to Environmental Concerns

| | | Agree | | It's Hard to Say | | Disagree | |
|---|---|---|---|---|---|---|---|
| | | # | % | # | % | # | % |
| 9. | Humankind is more likely to perish because of total destruction of nature rather than through a nuclear bomb. | 18 | 64 | 7 | 26 | 3 | 10 |
| 10 | Our future depends on how we live today. | 27 | 96 | 1 | 4 | | |

In analyzing this data, most teachers were in agreement that natural resources need to be conserved for future generations and that it is possible for people of different cultures and traditions to get along. In considering the idea that the building of new nuclear plants means to create "ecological bombs," 18 percent agreed, 25 percent disagreed and 57 percent said it was hard to say. This inability to formulate an opinion indicated a definite need for more understanding on this issue. Of greater significance was the fact that 64 percent of the teachers surveyed believe humankind is more likely to perish because of total destruction of nature rather than through nuclear bombs. While not all global environmental problems were addressed, 94 percent strongly agreed that our future depends on how we live today and that global environmental problems are a definite concern.

Of the 28 original responding American teachers, the 13 science teachers were selected and established as the local target group of teachers.

To further justify the need to explore the multifaceted, integrated problem of correlating global thinking with global environmental problems and solutions, the science teachers were asked to define "global thinking" (Appendix A:56) and to state the most serious global environmental problem (Appendix B:59). In defining global thinking, the comments were creative and thoughtful but with no clear definition. As to the most serious global environmental problem, there was extreme diversification with no general consensus of opinion.

Finally, this local target group of American teachers was asked: Because of the ecological imbalance, what environmental problem do you think is the most serious concern of the Russian people? When asked this question, the teachers had a difficult encounter. While 46 percent answered the questions with air and water pollution caused by radiation and industry, 54 percent answered with no idea or a negative thought (Appendix C:63). This clearly showed a need for a better understanding of Russia's environmental problems.

To ascertain the need to increase the teaching of critical and creative thinking skills, the local target group of teachers was asked to do a self-appraisal of the teaching of these skills in their classroom (Appendix D:66). Using a questionnaire adapted from Presseisen (1987), only 34 percent of the teachers claimed to use these skills very often (Appendix E:69). There remained a discrepancy of 66 percent who needed to increase the teaching of critical and creative thinking skills

by a minimum of 50 percent.

The above analyses of statistics and needs assessment gave rationale for the purpose and goal of this project, that being, the international linkage between Model School A and its Russian counterpart in Moscow with the task of using critical and creative thinking skills to find possible solutions to global environmental problems. To achieve this goal, the following objectives were proposed:

1. Through a collaborative cross-cultural planning, the teachers in the local target group and their Russian counterparts, after an 18-week implementation, would identify and agree upon common global environmental problems by producing a rank-ordered list of global environmental problems, as a result of a brainstorming session and a community survey.
2. Through a school site-based inservice for science teachers, teachers would strengthen skills in critical and creative thinking from a global perspective to assist in the daily articulation of lessons, as evidenced by weekly lesson plans for 18 weeks.
3. Through the utilization of problem-solving strategies and activities, 66 percent of the science teachers at Model School A would increase the teaching of critical and creative thinking skills by a minimum of 50 percent, as ascertained by the comparative difference between the pretest and posttest questionnnaire administered in October

1992 and March 1993.

4. The science teachers at Model School A would collaborate locally to develop a unit of study that would increase students' awareness of global environmental problems and possible solutions, as evidenced by a class developed video presentation and a newsletter by the end of the 18-week implementation.

## CHAPTER II

### Research and Solution Strategy

According to research done by Collins (1991:9), in order to thrive in the 1990's, "teachers must teach students how to think, create ideas cooperatively, select among alternatives and use far-minded flexibility in groups." Beyer, cited by Peters (1986:2), reports that the only way students will learn to think critically is if teachers use direct-instruction methods; the attitude, skills and knowledge must be established as explicit goals of instruction. Programs designed to teach critical thinking skills need to be integrated with insights from both psychology and philosophy. Beyer (1990) relates the two by explaining psychology contributes to "how" thinking occurs and philosophy gives substance as to "what" should be included in the curriculum. In order for students to become better managers of their own thinking and learning, Brandt (1990) stresses the need for curriculum to be designed so that teachers are better able to "connect" thinking skills with subject matter instruction. For effective thinking, students must be able to judge their thinking success by creating new ideas and translating them into reality, using real-world situations (Collins, 1991).

Ramler's (1991) research reveals that in order to prepare students for the twenty-first century, the goals of education need to be redefined in terms of global

education and global thinking. Cited by Tye (1990:5), Hanvey's widely accepted definition of global education is as follows:

> Global education involves learning about those problems and issues that cut across national boundaries, and about the interconnectedness of systems - ecological, cultural, economic, political, and technological. Global education involves perspective taking - seeing things through the eyes and minds of others - and it means the realization that while individuals and groups may view life differently, they also have common needs and wants.

Global educators argue that the "future needs to be brought centrally into the educational process so that students are given the opportunity to study, reflect upon and discuss alternative, possible, probable and preferred futures" (Selby, 1987:27). A student brought face to face with new perspectives and new ways of seeing the world, will invariably become involved with the problems and prospects of people and environments thousands of miles away thus changing values and behavior (Selby, 1987). This global emergence places a new focus on the role of the individual in the world system. In Globescope, cited by Peters (1986:46), the new role is defined as, "a self-conscious awareness of one's involvement requiring a new set of attitudes and social skills which enable the individual to take effective and responsible action."

Global thinking is best defined by Hassard and Weisburg (1992:43) as being the "ability to reason in terms of entire systems and to predict the consequences of

altering any subpart of the system." The curriculum entitled Global Thinking (1990) uses the analogy of comparing the earth to a live, breathing cell in which every aspect of life is interconnected and interdependent in describing the whole concept of global thinking. This concept of the Earth as a live being was first viewed by Vladimir Ivanovitch Vernadsky, a famous Russian Scientist (1863-1945). Not only is he given credit for laying the foundation for global thinking but also for coining of the bioshpere or "sphere of life" (Global Thinking, 1990). Another theory that looks at the Earth in holistic terms is that of James Lovelock. In 1977, Lovelock postulated his "Gaia Hypothesis" in which he treats the Earth as a whole where "life, climate, the atmosphere, and the planet itself - from dirt and rock to the molten core - all affect each other" (Bremer, 1991). While not completely accepted by the scientific community, this way of thinking involves more than just the biosphere. It proposes that the living planet works by means of feedback from all its parts to maintain stable conditions (Global Thinking, 1990). This thinking enables one to see that if humans are but one species of the planet, then the actions of humans can be directly related to many of the global environmental problems existing on the Earth.

Tucker (1990:118) refers to the learning of global thinking as being innovative in that it has two basic aspects - "anticipation and participation." The best description of these two concepts comes from Global Thinking (1990:iv):

> Anticipation is the capacity to face new situations.
> It is the ability to deal with the future, to predict

> the future, to predict coming events and understand the consequences of current and future actions. Anticipation also implies "inventing" future scenarios and developing philosophy that humankind can influence future events.
>
> Participation on the other hand is the complementary side of anticipation. Students must participate directly in learning. Cognitive psychology informs us that knowledge is constructed by students, not transmitted directly from teacher or textbooks to students. Students must become active participants not only with other students in their own cultures but with students and teachers in other cultures.

In 1987, the World Commission on the Environment (WCED) to the General Assembly of the United States published its report called Our Common Future. This report expanded and clarified the concept of global thinking with regard to the environment. No longer was the environment to be thought of as an afterthought in the development process. Summarized by the phrase "sustainable development," Brown et al (1991:1) quoted from Our Common Future as meaning "the development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

In 1989, a cross-cultural educational exchange with regard to critical thinking and global education took place between USSR's Academy of Pedagogical Sciences (APS and Montclair State College, Montclair, New Jersey. Matthew Lipman, professor at Montclair State and director of the Institute for the Advancement of Philosophy for Children was invited to visit the USSR by

Nikolai Nikandrov, Deputy Director of the APS. The reason for the invitation stemmed from the fact that Lipman had written a book called Philosophy for Children which promotes critical thinking by encouraging students to learn about and discuss philosophical questions through specially written novels that illustrate basic philosophical concepts. According to Nikandrov, the Soviet schools were in trouble: "the students complained that what they were being taught was irrelevant, and the school system had no way of identifying and supporting the superior academic programs that might provide Soviet children with a meaningful education" (Lipman, 1991:74). The deputy Director thought that Lipman's book, a critical thinking curriculum, was the solution to the existing problem. Ironically, Lipman had been greatly influenced by ideas of soviet scholar, Lev Vygotsky. In the 1920's, Vygotsky, along with Dewey, pioneered the educational revolution that put emphasis on thinking rather than on knowledge. Lipman's curriculum reflects Vygotsky's idea that thinking clearly calls for a restructuring of the classroom so that "vigorous and reasonable dialogue" can take place. Vygotsky brought out in his works what was probably the "most common cause of miseducation: the failure to convert the classroom into a community of discursive inquire." (Lipman, 1991:73). This exchange of ideas clearly showed how one variety of Soviet educational psychology was welded into an American educational practice.

Another cross-cultural exchange that took place was between the Association for Humanistic Psychology (AHP) and Moscow's Academy of Pedagogical

Sciences. Between 1983 and 1990, more than 12 delegations of professional psychologists and educators traveled to what is now the Commonwealth of Independent States (CIS). In return, more that 25 Russians traveled to the U.S. with the latest being in November 1988, in Atlanta. Throughout this period, the AHP Soviet Project was actively involved in opening channels between educators and psychologists and, as a result, establishing a sharing network based on increasing humanistic education, creative teaching methods, and teacher training (Hassard, 1990).

In May 1989, as a member of the AHP Soviet Project, Dr. Jack Hassard of Georgia State University continued to collaborate with the USSR's Academy of Pedagogical Scienced in developing a cross-cultural, interdisciplinary, problem-solving curriculum involving telecommunications. In the project called "Global Thinking" both parties agreed to develop strategies, methods and teaching materials to help students think globally. In essence, the project objectives were to (Hassard and Weisburg, 1992:43):

> 1. Empower students and teachers to get involved with important global problems and concerns.
>
> 2. Introduce students to methods and strategies of inquiry that can be used to solve problems and to provide the knowledge and technological means needed to deal with problems globally.
>
> 3. Develop the computer literacy in students that will allow them to use microcomputers as telecommunications tool to collaborate with counterparts in other nations.

The Global Thinking Project used the Applelink telecomputing system with IASNET in Russia, GEISCO in Western Europe and the U.S. system to link six pairs of schools from Los Angeles, California; Atlanta, Georgia; and Pittsburgh, Pennsylvania, with schools in Moscow and Leningrad (now St. Petersburg). In all, 11 American and Soviet schools, 400 students, and 14 pilot teachers participated in curriculum dealing with problem-solving strategies to such global environmental problems as solid waste, and global warming (Hassard and Weisburg, 1992).

While results have not yet been published, a joint meeting of both the U.S. and Soviet teachers in Moscow, in April 1992, revealed that feedback on the project design warrants that a great deal of teacher and administrative support is needed on both sides. In addition, collaborating teachers and students should be matched in terms of age, and subject participants should focus on practical application of global topics, and the exchange of information needs to be accelerated (Hassard, 1992).

According to Hassard (1990), aside from individual visits to the Soviet Union, the notion of "exchanges" in which Soviets and Americans would visit each other's countries was unknown until 1958, when the two governments, led by Dwight D. Eisenhower and Nikita S. Khruschev, signed a two-year agreement spelling out exchanges to be conducted in culture, education, science, technology and other fields. Both recognized that improved communication and mutual understanding was imperative for survival in the nuclear age.

Besides linkages between the U.S. and CIS, LeBaron and Warshawsky (1991) reported another successful collaboration was between Massachusetts and Germany. On June 1, 1989, 8th graders in three Massachusetts schools participated in a live, two-way, 90-minute video teleconference with students in Karlsruhe, Germany. This event culminated a year-long project in which students, teachers, and project staff communicated via electronic mail on local and international environmental issues. These students were part of an ongoing multi-organizational partnership called KITES (Kids Interactive Telecommunications Experience by Satellite). Initiated early in 1988 by the University of Lowell College of Education, KITES focused on scientific and policy implications of nuclear power. The purpose of this project was to "advance student's cross-cultural sensitivities and infuse the curriculum with the vitality of international perspectives" (LeBaron and Warshawsky, 1991:61).

When it comes to environmental problems, global thinking is nothing new. Historical background information in Global Thinking(1990:8), quoted Albert Einstein as saying, "everything has changed save our mode of thinking" shortly after the atomic bombs were dropped on Hiroshima and Nagasaki in 1945. In 1962, Andre Sakharov, the great Soviet physicist and humanitarian, warned the Soviet government that atmospheric testing should be banned, if humankind is to be protected from the effects of nuclear fallout (Global Thinking, 1990). On April 28, 1986, the day of Chernobyl, French (1992:5) quoted the Soviet Foreign Minister Eduard Sheverdnadze:

> Even before we pronounced this name (Chernobyl) and even before we revealed for ourselves and the whole world the scope of this catastrophe which it designated, it has already become abundantly clear that from then on no ecological calamity could any longer be regarded as pertaining solely to the national territory on which it had occurred.

As a result of Chernobyl, in August 1987, a large scale conference on environmental education was held in Moscow organized jointly by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and the United Nations Environmental Programme (UNEP). The theme stressed at this conference was the "sustainable use of resources and the need to live in harmony with the biosphere" - both locally and internationally (Booth, 1987:45). Also stressed was the need to develop a balance between ecology and economics. In a visit to Moscow in 1990, regarding environmental education, Winfrey (1992:46) found the same environmental concerns to be prevalent. In an interview with Pavel N. Gusev, chief editor of the daily newspaper Moskovsky Komsomolets, Gusev said, "Western countries cannot realize how close we are to environmental disaster. No persons have found who are responsible for what has happened. Our laws are not enforced." He went on to explain that, "as the new market economy develops, Goskompriroda (the U.S. equivalent of the Environmental Protection Agency) is charged to find a balance between economic development and environmental issues." In a translation from the June-July, 1992 Moscow

Magazine, Douglas Stanglen's article "Sick Soil," gives a staggering account of Russia's environmental problems: 75 percent of all rivers, lakes and streams cannot be used for drinking; about 33 percent of all underground water is contaminated; more than 5 percent of equipment used in factories is worn down and does not meet even the lowest pollution or safety standards; 40 percent of the Aral Sea, once the sixth largest sea in the world, has disappeared since 1960, causing warming temperature, high infant morality rate, recurring illnesses in adults and reduced cotton output; 15 percent of the CIS is an ecological disaster with over 40 million people and 50,000 acres of land being affected with radiation from Chernobyl; chemical and human waste is being dumped into the Baltic Sea daily. According to Winfrey (1992:50), the people of Russia are "an endangered species and need world support to resolve their immediate and evolving health problems and deal with other aspects of environmental damage."

In every aspect of life, boundaries between domestic and foreign affairs are disappearing. Ramler (1991:44) reports that, "planetwide ecological issues are requiring international collaboration and international responsibility." The latest attempt of this is the first Earth Summit, the U.N. Conference on Environment and Development (UNCED), which took place in Rio de Janeiro, Brazil during June 3-14, 1992. While attempting to find solutions to such global environmental problems as ozone depletion, global warming, acid rain toxic waste disposal, deforestation, and the loss of the earth's biological diversity, it becomes very clear that unless nations and their people are willing to make drastic changes in their

lifestyle, the possibility of finding any solutions is impossible. According to Postel (1992:1), the 1990's will be a "decisive decade for the planet and its inhabitants." With the current notions of economic growth at the root of the earth's ecological deterioration, a rethinking of our basic values is needed. Postel (1992:4) suggests;

> Building an environmentally secure world - one in which human needs and wants are met without destroying natural systems - required a wholly new economic order - one grounded in the recognition that high levels of consumption, population growth and poverty are driving the earth's environmental decline.

As a result of the ecological imbalance, human health is affected drastically. Brown's (1992) research reveals that thousands of children living in Los Angeles will have permanently damaged respiratory systems impaired by air pollution by the age of 10; there will be an increase in the 300,000 Russians already being treated for radiation sickness; and the depletion of the ozone layer will cause an additional 200,000 cases of skin cancer over the next half-century.

In order for ecological disaster to be remedied, governments must be willing to either give power or the financial resources to international organizations (French, 1992). French (1992:7) concludes that "fundamental reforms will be needed if yesterday's institutions are to respond to today's - and tomorrow's - challenges."

Confronted with a problem that includes global perspective, as well as the environmental concerns of the CIS, an immediate solution strategy for this practicum was to tie into the Sister Schools Project and its conference attended by this writer in June 1992. At the conference, connections were made with Russian educators. The target school and a Moscow school were paired. Global environmental concerns were issues held common by the staff at both schools. Having established a cross-cultural linkage between Model School A and a Russian counterpart, discussions were held so that teachers could collaborate on developing strategies, methods and activities from both cultures to 1) identify common global environmental concerns, and 2) to find possible solutions through creative and critical thinking skills.

A telecommunications networking system established between the two schools would have been ideal. Unfortunately, this technology could not be implemented for two reasons: (1) the computer systems between the two schools were incompatible; (2) the administrative and financial support needed was lacking at Model School A. Therefore, more conventional methods, such as letter writing, faxing, telephoning, and personal delivery from persons traveling between the two countries, were the methods used to communicate.

The strategy was to use a sister schools pairing to teach a topic of common concern emphasizing creative and critical thinking skills. This approach not only developed global education in the classroom, which was an issue held common by both countries, but used a teaching approach that was needed by all students in

both countries. To impact teachers from both schools, Thinking Skills, developed by Nancy Galante and Broward County Schools (Florida), was used to train teachers on the latest techniques in both critical and creative thinking skills that were used in daily lessons.

Having been given permission from Dr. Jack Hassard of Georgia State University, several of the suggestions and activities developed by the U.S. Soviet Global Thinking Project were integrated into this practicum.

Software developed by Earthquest, Inc. (1990), called Earthquest, was set up as a learning center on a rotating basis among participating teachers at Model School A. Through this Computer Assisted Instructional Program, students were able to exlore both factual documentation and experiment with simulations on global environmental problems and solutions.

SimEarth, software by Maxis (1991), was set up as a learning center on a rotating basis in individual participating science classrooms. Based on James Lovelock's "Gaia Theory," an holistic approach to understanding life and natural phenomena, students were able to simulate their 'own' planet with individually designed environmental problems and consequences. This enhanced both critical and creative thinking skills and gave realistic visions into the future of the planet.

GTV Planetary Manager, an interactive video produced by National Geographic (1992), was used in classroom instruction to help pique interest in global environmental problems and help students to better comprehend the state of the earth. Through class discussions and cooperative learning teams, students

were able to examine specific environmental problems, explore consequences and wrestle with possible solutions. In addition, students were able to use the "Showmaker" portion of the program to develop their own program in the role of "Planetary Manager." The "Endangered Earth" map accompanying this program was used by students to help see specific growing environmental threats graphically as they are found around the world.

To further increase inductive and inquiry thinking skills, Science Sleuths, an integrated science videodisc program produced by Videodiscovery (1992), was integrated throughout the practicum to help focus on encouraging students to articulate theories and to test them while trying to solve ecological "mysteries."

Using the MacIntosh LC II computer and Microsoft Word, students were able to record, save, and print discoveries and thoughts, as well as letters to Russian pen friends.

Small group discussions and cooperative learning activities were ongoing, as part of the activities developed by the collaborating team of teachers.

All students and teachers involved in the practicum project were paired with "pen friends" from their Moscow sister school. Through this correspondence, an open dialogue of sharing took place. This sharing of ideas, problems and solutions pertaining to the environment was ultimately published in a Russia-Florida, student-teacher produced newsletter. In addition, global environmental solutions derived by the teachers and students at Model School A were videotaped in a simulation of an "Earth Summit."

# CHAPTER III

## Methods

### Pre-Implementation

In anticipation of a linkage between Model School A and a Moscow sister school, the writer of this practicum took to the conference in Moscow a video presentation of Model School A and copies of the school's yearbook and yearly progress report, in order to introduce Model School A to its Moscow sister school principal and teachers. Model School A T-shirts, pencils, pins and stickers were also taken as gifts and presented to the Moscow staff. In return, the principal of the Moscow sister school presented this writer with several pictures of classes and teachers along with a written documentation describing the school, student body and curriculum. Letters written by Russian students were received to be distributed to Model School A students desiring Russian pen friends. The writer of this practicum took several pictures of the conference, sister school teachers and their families and Moscow. Through the interpretative efforts of one of the Russian teachers who teaches English, the practicum design and project idea was discussed and explained to the principal and staff at the Moscow sister school. This teacher coordinated and collaborated with the writer of this practicum in developing and implementing activities and in getting results back to this practicum writer. Prior to leaving Moscow, the Moscow school coordinator

was given a copy of the attitude survey used in the Global Thinking Project and a copy of the Global Thinking Curricula. The Russian teachers involved met with this writer and discussed ways in which this material could be implemented simultaneously during the first two weeks of the practicum. A week after returning to Florida, the science textbooks used in the 6th, 7th and 8th grades at Model School A and four copies of Thinking Skills were delivered to the coordinating teacher in Moscow by a visiting administrator from another school in Florida. In addition, a letter of invitation to the principal and coordinating teacher of the Moscow sister school from the principal of Model School A was delivered, inviting them to visit Florida and Model School A. Prior to the implementation of this practicum, this writer telephoned the coordinating teacher at home in Moscow and went over any questions or concerns up to this date. In preparation for the first week of implementation, this writer prepared a slide presentation from the pictures taken, a scrapebook of pictures and information received from the conference, the sister school, and Moscow, and a display of the many souvenirs and gifts from Russia.

## Implementation

### Week 1. Teacher Orientation.

The results of the June 1992, Moscow conference and the Sister Schools Project were shared with the local target group of science teachers. Discussed was the overall concept of the practicum project and the role that the teachers

were to fulfill. Teachers were informed that the project was to center on the teaching of creative and critical thinking skills while trying to find possible solutions to global environmental problems. Using slides, photographs, children's art, souvenirs and gifts, the local target group of teachers was introduced to their Moscow sister school. Discussed was the background on the faculty, administration, student population, curriculum, teaching strategies and results of collaboration/discussions with the Moscow teachers. The geographic location of Moscow was discussed in comparison with Florida on a world map. Cultural diversities, history, and life styles were also discussed. The American teachers were paired with teachers from the Moscow sister school, according to grade level. Teachers were asked to write a letter to their pen friend teacher. In addition to biographical information, teachers were asked to include concerns about the environment. Thinking Skills developed by Nancy Galante and Broward County Schools was distributed to each teacher. Teachers were inserviced on the creative and critical thinking skills to be implemented during the course of the practicum. Teachers were advised that they would be meeting weekly to discuss and collaborate on activities and skills to be incorporated in lessons, as evidenced by their weekly lesson plans. It was decided that the weekly meetings would be held on Thursday mornings at which time lesson plans would be checked by this practicum teacher and a school-based administrative advisor. It was also decided that since the Moscow sister school was a school for the gifted and advanced students, teachers should select their most advanced classes for the

final comparison analyses. Teachers were made aware that this would take place for a minimum of 18 weeks. Materials, programs, resources and software to be used during the practicum were shared and discussed by the practicum teacher. Teachers were inserviced by the practicum teacher on the use of the technology that would be used during the next 18 weeks. The technology covered included the laser-disc interactive computer player, and LC II Macintosh computer. A rotating schedule was established so that all teachers could share with their students the slide presentation prepared by the practicum teacher.

Week 2. Student Orientation.

Showing the slides on a rotating basis, teachers introduced their students to the Moscow sister school teachers and students. Using curriculum materials from The Global Thinking Project, teachers were given information on global thinking and its history, global education, the Gaia Theory, and the overall concept of the practicum. Additional information on the Gaia Theory was also made available through the SimEarth computer program. Teachers used this information to establish a "global thinking" classroom and atmosphere. Acting as a facilitator, teachers ascertained from students a definition of global thinking through the use of inquiry and questioning techniques. Using a world map, teachers discussed the geographic location of Moscow, Russia compared to South Florida. Five students in each classroom were divided into team groups. Each team brainstormed to come up with ideas for an interactive "global thinking" bulletin board. Some of

the things listed to be put on the bulletin board were newspaper articles, pen friend letters, drawings, photographs, magazine articles, map of Florida, and a map of Russia. Each team was assigned the task to maintain the bulletin board for a week. A schedule was written up and posted. Students were assigned to write to a Russian pen friend. Some students were given Russian pen friend letters brought from Russia. In the letter, each student was to include personal and family information, hobbies, favorite subjects, environmental concerns in Florida and questions pertaining to environmental problems in Russia. These letters were mailed to the coordinating teacher in Moscow along with lesson plans and educational materials to be used at a later date in the practicum. Using an adapted version of the Attitude Survey used in the Global Thinking Project (Appendix F:72), teachers surveyed their students on attitudes towards society and the environment. This served as a pretest for students. Teachers compiled the data and submitted the results to the practicum teacher for further compilation and analysis.

Week 3-4. Gobal Environmental Problems Community Survey.

A community survey was developed by both teachers and students on global environmental problems. Teachers met first to brainstorm and list the most serious problems. The same technique was done by each teacher in the classroom. The teachers met a second time and established a representative list of the most serious global environmental problems. Each classroom teacher

surveyed students on global environmental problems and rank ordered from most serious to least serious (Appendix G:77). The results were tallied on the projector using a transparency of the global environmental chart (Appendix H:79). Each student was given 10 copies of the global environmental list and one copy of the global environmental tally chart and assigned to survey five middle school students and five adults. The results were tallied by each classroom teacher and then submitted to the practicum teacher. The survey was faxed to the Moscow sister school requesting participating teachers and students to conduct the same survey. The results of the Moscow survey were faxed back to the practicum teacher for comparison and analysis, in an effort to establish a common environmental concern. Communication for the purpose of working the practicum was monitored through telephone calls between the coordinating teacher in Moscow and the practicum teacher.

Week 5. Florida vs. Russia Environmental Problems.

Teachers and students compared and contrasted the environmental problems prevalent in Florida and in Russia. An activity packet on Florida's environmental problems was made up from The Florida Blackline Masters, produced by Prentice Hall (1990), and distributed to the local target group of teachers. This packet was completed by students and discussed in the individual classrooms. Students also received the Water for South Florida booklet, produced by the South Florida Water Management District, which was completed by students, reviewed and

discussed in class. A data sheet on Russia's environment was prepared by the practicum teacher and distributed to participating teachers. Information on Russia's environment was also obtained from the Worldwatch Institute's Environmental Almanac, Earthquest, and GTV Planetary Manager's large wall map of the "Endangered Earth." Students worked in cooperative teams to develop possible solutions for the discussed problems. Students were assigned to maintain a journal to log in activities and research data, during the course of the practicum. Students were permitted to use the Microsoft Word program to record and save this data. Students worked in cooperative teams to develop questions on the environment to be answered by Russian students. Teachers compiled and discussed questions in class. Teachers met and compiled one list of questions which was faxed to Russia. Russian students were asked to compile a list of environmental questions that they would like Model School A students to answer. This packet of instructional materials was mailed to Moscow by regular mail and received by the coordinating teacher in Moscow two weeks later.

Week 6. Presidential Campaign and Environmental Problems.

Teachers met and developed a unit dealing with the United States presidential campaign and environmental problems and needed legislation. Information gained from Prodigy on the presidential candidate's platform, regarding the environment, was extremely useful in this lesson. Teachers taught this unit in individual classrooms. The culminating activity was a mock debate held in the

cafeteria with selected students representing the three presidential candidates. The student audience fielded questions to the candidates pertaining to environmental legislation. A copy of the lesson plan and resource materials was mailed by regular mail to Moscow and received 10 days later.

Weeks 7-8. Exploration of Global Environmental Problems.

Using multi-media materials and resources, teachers and students explored and researched information on the major global environmental problems. In addition to resources and materials supplied by individual teachers, all teachers and students used GTV Planetary Manager Interactive laser-disc program and Earthquest on a rotating basis. Cooperative teams of students were created. Using the "Showmaker" portion of GTV Planetary Manager, students created their own program and presented it to the class. In cooperative groups, students discussed, recorded and reported on possible solutions to the global environmental problems presented. Teachers and students used lessons from Science Sleuths, Videodisc Discovery Series, to enhance skills of inquiry and critical thinking. Pen friend letters were received from Russia along with results of the attitude survey. The results of the attitude survey from both Russian and Florida students were compiled by the practicum teacher. The results were distributed to the local target group and shared with students in the classroom. Students read their pen friend letters aloud in the classrooms. Students were assigned to write pen friend letters. Letters and the attitude survey were hand

carried to Moscow by a professor from a Moscow university visiting a Florida university. Telephone calls to monitor results and activities continued between the coordinating teacher in Moscow and the practicum teacher.

Week 9. Independent Research Activity Planning.

Teachers met and discussed what should be included in the independent research activity on the topic of global environmental problems. Teachers concluded the project should center on an Earth Summit simulation. Teachers were assigned to research and gather information, resource and teaching materials to assist students in their research and project presentation. Teachers convened to share information and establish criteria to be included in the independent research project. The lesson plan was written by the practicum teacher, distributed to the local target group of teachers and mailed by regular mail to the coordinating teacher at the Moscow sister school, along with available copies of resource materials (Appendix I:81). A follow-up telephone call was made to confirm arrival of this material.

Weeks 10-11. Preparation for Earth Summit.

Teachers assigned students independent research activity projects. Students were given project criteria and two weeks to complete the project.

Week 12. Earth Summit.

Students presented results of independent research in the form of a simulated Earth Summit. Student presentations and Summit were videotaped and edited by the school's media specialist. Students and teachers viewed and discussed the results of presentations and Summit.

Week 13. Global Environmental Problem Solutions.

Teachers and students convened and formulated a list of possible global environmental problem solutions. Selected students and practicum teacher presented these resolutions in the form of an Earth Charter. The presentation was videotaped and edited by the school's media specialist. Teachers and students viewed and discussed the end product.

Week 14. Greetings to Moscow Sister School.

Teachers and students participating in the project, videotaped greetings to the teachers and students at the Moscow sister school. Visiting educators from Russia were shown both the tape of the Earth Summit and the Earth Charter and greetings. These tapes and pen friend letters were delivered to the Moscow sister school by these educators. The coordinating teacher in Moscow was telephoned to confirm the arrival of the videotapes.

Week 15. Russian Response to Activities.

Russian students' questionnaire was received using a fax machine (Appendix J 87:). Also received were answers to some of the environmental questions asked by Florida students, and a drawing depicting the environment drawn by a Russian student. Class sets were duplicated and circulated to participating teachers. Working in cooperative teams, teachers convened with individual classes to discuss answers to the questionnaire. One list of answers was submitted from each participating teacher. These resultant answers were compiled by the practicum teacher and mailed to the Moscow sister school. The coordinating teacher was telephoned in Moscow to update practicum activities

Week 16. Preparation for Newsletter.

Teachers met to develop criteria for a contest to develop a logo and name for a jointly produced newsletter. Students were given one week to enter the contest. The winning logos and names were selected. Students were awarded prizes by the practicum teacher. Teachers and students decided upon materials to be included in the newsletter.

Week 17-18. Newsletter.

Teachers and students prepared the layout for the newsletter. The newsletter was completed using Pagemaker and printed on a laser printer.

Week 18. Posttest

Teachers and students were given the final evaluation of the project in the form of a critical and creative thinking posttest using materials from the Global Thinking Project (Appendix K:89). The local target group of teachers was given the posttest on the self-appraisal of the teaching of critical and creative thinking skills.

# CHAPTER IV

## Results

To measure and monitor the success of the practicum outcome objectives, this writer used a variety of techniques that encompassed both the cognitive and affective domains. Two community surveys were conducted at Model School A and in the Moscow sister school. The first survey was an attitude survey administered to students, in order to ascertain how students from different cultures feel towards the environment, global environmental concerns, and mankind. A follow-up survey was administered to both middle school students and adults. This survey required the participants to rank-order global environmental problems for the purpose of establishing a common environmental concern. Teachers at both schools were inserviced on techniques and strategies to increase the use of critical and creative thinking skills as a base for lesson planning and development. Teachers at Model School A were given a pre- and post-implementation survey in order to self-appraise their teaching of critical and creative thinking skills in the classroom. A videotaped presentation and creative posttest was completed by both teachers and students at Model School A to reflect their understanding and awareness of global environmental problems and solutions. Teachers and students at both schools collaborated jointly to produce a newsletter epitomizing the essence of the cross-cultural linkage between Model

School A in Florida and the Moscow sister school in Russia and the overall success of the practicum experience.

The attitude survey was very instrumental in helping to establish a global thinking atmosphere in which to introduce the practicum concept. It addressed issues that reflected both the similarities and differences between the two cultures and educational backgrounds. While the attitude survey was administered by the local target group of teachers to their most advanced/gifted classes, the Moscow sister school only conducted the survey among their ninth grade students. As a result of this, the final comparison analysis was made between the 43 advanced and gifted eigth grade students at Model School A and the ninth grade students from the Moscow sister school. Unfortunately, the results received from Moscow failed to indicate how many students were surveyed. Despite frequent requests, this information was never obtained. This could have been because of a communication breakdown due to language barriers. Consequently, the final results reflected a comparison analysis by percents only (Appendix L:91).

In actuality, an entire thesis could be done on the results of this survey and the underlying reasons for the results. To summarize the high points briefly, the students from both cultures were almost totally in agreement that the future of the world depends on how people live today and that an ecological catastrophe could occur if people don't change the way natural resources are used. Statement number 31 which stated that a nation's character can be saved through isolating it completely from the influence of other nations, resulted in the closest alignment

of attitudes with both cultures agreeing with 14 percent, only a 1 percent difference with "it's hard to say," and only a 1 percent difference with students disagreeing. Compared to Florida's 37 percent, 86 percent of the Russian students agreed that to build new nuclear power plants means to create "ecological bombs." This difference could very well be due to the Chernobyl incident of 1986 and the 1993 disaster in Siberia. The Russian students seemed to be more decisive than the Florida students with fewer responses for "it's hard to say." In addition, eight questions were answered 100 percent by only Russian students. One of the biggest differences was that 100 percent of the Russian students were in agreement that humankind is more likely to perish because of total destruction of nature rather than through a nuclear bomb. Only 49 percent of Florida students agreed with this statement, while 40 percent said it was hard to say. Statistics stating that 15 percent of Russia's environment is an ecological disaster could account for the strong feelings and attitudes of the Russian students. While no percentages were received for questions 38 and 39, 53 percent of Model School A students said that they could personally identify with the test questions and 63 percent said that they had previously thought about some of the questions on the test. These results gave evidence for the validity of the survey questions. The greatest similarities between the two cultures were reflected in question 40 where students were asked to indicate words from the questionnaire that were most important. The Russian students listed the following words as having the greatest value: environment, person, humankind, understood, nature, resources, health,

society, future, school education, truth, history, conflict and agreement. The students from Model School A responded most frequently with: overpopulation, environment, animal preservation, history, education, family, friends, earth, resources, money and health. Students from both schools chose environment, resources, health, history and education as having the most value.

While the global environmental survey at Model School A was comprehensive in surveying 459 middle school students and 435 adults, the results received from Russia did not indicate the numbers of people surveyed, but only rankings. The Russian survey did, however, add another dimension and included the ranking of high school students. While not part of the original collaborative lesson plan, the results were included in the final analysis, as this writer thought them of value. Table 2, below, reflects the final ranking of global environmental problems from Florida middle school students, Moscow middle school students, Moscow high school students, Florida adults and Moscow adults.

Table 2

Global Environmental Survey Results

| | FLORIDA M.S STUDENTS | MOSCOW M.S STUDENTS | MOSCOW H.S. STUDENTS | FLORIDA ADULTS | MOSCOW ADULTS | TOTAL |
|---|---|---|---|---|---|---|
| OZONE | 1 | 4 | 1 | 1 | 5 | 12 |
| DEFORESTATION | 6 | 5 | 7 | 6 | 3 | 27 |
| GLOBAL WARMING | 4 | 11 | 2 | 5 | 10 | 32 |
| WATER POLLUTION | 9 | 2 | 10 | 6 | 2 | 29 |
| ACID RAIN | 10 | 7 | 3 | 8 | 6 | 34 |

Table 2 (continued)

Global Environmental Survey Results

| | FLORIDA M.S STUDENTS | MOSCOW M.S STUDENTS | MOSCOW H.S. STUDENTS | FLORIDA ADULTS | MOSCOW ADULTS | TOTAL |
|---|---|---|---|---|---|---|
| TOXIC WASTE DISPOSAL | 7 | 6 | 5 | 7 | 7 | 32 |
| AIR POLLUTION | 5 | 1 | 6 | 3 | 1 | 16 |
| SOLID WASTE DISPOSAL | 11 | 8 | 9 | 9 | 9 | 46 |
| HUMAN HEALTH & DISEASE | 2 | 3 | 4 | 2 | 4 | 15 |
| LAND USE (ABUSE) | 12 | 13 | 12 | 9 | 11 | 57 |
| NAT'L RESOURCE DEPLETION | 13 | 9 | 10 | 11 | 12 | 5 |
| ANIMAL EXTINCTION | 8 | 10 | 11 | 10 | 8 | 47 |
| OVERPOPULATION | 3 | 12 | 8 | 4 | 13 | 40 |

Table 3 shows the final overall rankings.

Table 3

Moscow-Florida Students and Adults

| | |
|---|---|
| 1. | Ozone |
| 2. | Human Health and Disease |
| 3. | Air Pollution |
| 4. | Deforestation |
| 5. | Water Pollution |
| 6. | Toxic Waste Disposal |
| 7. | Global Warming |
| 8. | Acid Rain |
| 9. | Overpopulation |
| 10. | Solid Waste Disposal |
| 11. | Animal Extinction |
| 12. | Natural Resource Depletion |
| 13. | Land Use (Abuse) |

As indicated by this table, Ozone ranked as number one, with Human Health and Disease coming in second. Land use was reserved for last place.

Tables 4 through 7 list the rankings of global environmental problems as the various groups are compared.

Table 4

Moscow-Florida Middle School Students

| | |
|---|---|
| 1. | Ozone |
| 2. | Human Health & Disease |
| 3. | Air Pollution |
| 4. | Deforestation |
| 5. | Water Pollution |
| 6. | Toxic Waste |
| 7. | Global Warming |
| 8. | Overpopulation |
| 9. | Acid Rain |
| 10. | Animal Extinction |
| 11. | Solid Waste Disposal |
| 12. | Natural Resources Depletion |
| 13. | Land Use (Abuse) |

Table 5

Moscow-Florida Middle
School Students and Adults

| | |
|---|---|
| 1. | Ozone |
| 2. | Human Health and Disease |
| 3. | Overpopulation |
| 4. | Air Pollution |
| 5. | Global Warming |
| 6. | Deforestation |
| 7. | Toxic Waste Disposal |
| 8. | Water Pollution |
| 9. | Animal Extinction |
| 10. | Acid Rain |
| 11. | Solid Waste Disposal |
| 12. | Land Use (Abuse) |
| 13. | Natural Resources Depletion |

Table 6

Moscow Middle School
Students and Adults

| | |
|---|---|
| 1. | Air Pollution |
| 2. | Water Pollution |
| 3. | Human Health and Disease |
| 4. | Deforestation |
| 5. | Ozone |
| 6. | Acid Rain |
| 7. | Toxic Waste Disposal |
| 8. | Solid Waste Disposal |
| 9. | Animal Extinction |
| 10. | Global Warming |
| 11. | Natural Resources Depletion |
| 12. | Land Use (Abuse) |
| 13. | Overpopulation |

Table 7

Florida Middle School
Moscow High School Students

| | |
|---|---|
| 1. | Ozone |
| 2. | Human Health and Disease |
| 3. | Global Warming |
| 4. | Overpopulation |
| 5. | Air Pollution |
| 6. | Toxic Waste Disposal |
| 7. | Deforestation |
| 8. | Acid Rain |
| 9. | Water Pollution |
| 10. | Animal Extinction |
| 11. | Solid Waste Disposal |
| 12. | Natural Resources Depletion |
| 13. | Land Use (Abuse) |

While there was no consensus to one global environmental problem determined., human health and disease came the closest, ranking number two for Moscow-Florida students and adults, number one for Moscow-Florida middle school students, number two for Florida middle school students and adults, number three for Moscow middle school students and adults, and number two for Florida middle school students and Moscow high school students.

In addition to not receiving feedback from the total number of people surveyed, it took persistance to obtain the information received. Two long-distance telephone calls and a four-week wait were necessary to receive the results of the Moscow survey, which were faxed. This delay caused frustration to

this writer and the students and teachers at Model School A. An on-line telecommunication system could have avoided this delay and frustration.

While no results were received from the Moscow teachers, the local target group of science teachers at Model School A showed a definite increase in the actual teaching of critical and creative thinking skills. This was evidenced by a weekly check of lesson plans and classroom observations by this practicum writer and monthly checks by the on-site practicum administrator. Teachers admitted that, while they had previously integrated critical and creative thinking skills strategies within lesson presentations, they had not actually taught the skill prior to introducing the content concepts. The teachers involved in the practicum expressed appreciation and gratitude for being inserviced on the actual teaching of critical and creative thinking skills.

The pre- and post-implementation survey completed by the science teachers at Model School A did not meet the numerical percentages of 66 percent of the teachers increasing a minimum of 50 percent in the actual teaching of critical and creative thinking skills, as stated in objective 3. In analyzing the post-implementation survey, the researcher determined that more realistic outcome percentages would have resulted if an individual teacher analysis had been done with the pre-implementation survey results. When the results of both pre- and post-implementation were done by an individual teacher analysis and compared, there was an average increase of 14.7 percent with the range increase between 5 percent to 36 percent (Appendix M:97). Another obstacle was that

during the time lapse between the pre- and post-implementation survey, six of the original local target group of science teachers had experienced either a job change or school transfer. To make the statistics valid, the pre-implementation scores for these six teachers were again counted in the post-implementation results (Appendix N:100). In comparing the pre- and post-implementation scores, there was an increase of 21 percent of the teachers increasing a minimum of 20 percent (Appendix O:103). When considering only the remaining seven in the target group of science teachers, there was an average increase of four to seven teachers responding in the category of "very often" for an increase of 42.8 percent of the teachers increasing a minimum of 20 percent.

The simulation of an Earth Summit was very successful with 12 selected students representing Canada, the United States, Mexico, South America, the Carribean, Europe, Russia and the former Soviet Union, India, China, Africa, Indonesia, Iran and Iraq. These presentations were videotaped and reviewed by all the classes participating in the Earth Summit. Teachers and students convened and developed 14 resolutions entitled Model School A's Earth Charter (Appendix P:105). These resolutions portrayed the students' awareness of global environmental problems and possible solutions. A second concluding session was conducted and videotaped in which the representatives presented the resolutions. After editing the Earth Charter, both the Earth Summit and Earth Charter were combined into one tape. This video presentation was viewed by two visiting educators from Moscow. One of the educators, a principal of a school in

Moscow, was so impressed with the videotape, that she requested a copy for viewing at her school. The videotape was personally carried to Moscow by these two educators and given to the principal of the Moscow sister school. The principal responded in a letter that the video was well received by the school staff.

A newsletter produced jointly by both schools entitled, "The Global Gazette," took well over three weeks to put together. A logo contest was held in which there were two winners. It was decided, in a collaborate telephone conversation with the coordinating teacher in Moscow and this practicum writer, to include in the newsletter creative writings, cultural art done by students, excerpts from pen friend letters, community survey results, Model Schools A's Earth Charter and comments from both the Moscow sister school's director and this practicum writer. The finished product made all involved in the cross-cultural linkage and practicum experience very proud (Attachment 1). A university professor in Moscow requested and received permission to photocopy the newsletter for distribution to schools in Moscow.

# CHAPTER V

## Recommendations

It is highly recommended that the collaboration between Model School A and the Moscow sister school continue so that future student projects and curriculum development can take place. In order to do this more effectively, it is recommended that Model School A become a member of the newly formed, non-profit Florida corporation, Sister Schools International, Inc. This organization, which had grown from the original Sister Schools Project, has been incorporated to help member schools statewide establish foreign exchange programs and develop international curriculum and joint student projects.

The following are recommendations to develop a cross-cultural linkage:

1. Identify a common issue/concern/topic with sister partner.
2. Obtain the complete local administrative support of school principal, staff and superintendent of schools, to avoid unforeseen conflicts and misunderstandings.
3. Obtain an outside corporate sponsor to assist with expenses.
4. Write a complete business plan to include but not limited to objectives, goals of the program, itemized lists of anticipated expenditures, needed equipment, and expectations and commitments of the sponsor.

5. Establish a telecommunications system to expedite communications and the effectiveness of the program. In the state of Florida, Florida Information Resource Network (FIRN) is free and can easily be connected to INTERNET for international telecommunications. Equipment needed to accomplish this is computer, modem, outside telephone line, computer program compatible to computer, and on-line service.
6. Search for mentors to assist with understanding language of sister school partner to eliminate communication breakdown.
7. Apply to International Reachout with AT&T to get 15 percent reduction on long-distance telephone calls.
8. Develop an inservice program through administration, media specialist and Human Development Resources to inservice all personnel involved in the project with technology of telecommunications.
9. Make sure that collaborating teachers and students are matched in terms of age and subject matter.
10. Plan curriculum so that classes do not get ahead of one another as they work to complete an activity.
11. Develop communications between students with the teacher functioning only as a facilitator.
12. Have participating teachers sponsor a foreign language activity before

or after school.

13. Become a member of Worldwatch Institute, if pursuing a linkage based on the environment.
14. Research and apply for all grants for financial support of project goals and expenses.
15. Contact this practicum writer who is a member of the Board of Directors of Sister Schools International, Inc., for further information on the project.

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# APPENDICES

# APPENDIX A

## Global Thinking

# APPENDIX A

## Global Thinking

Define the term "Global Thinking."

| TEACHER | DEFINITION |
|---|---|
| A | Global thinking is an all encompassing idea to incorporate full scale thinking on many levels. |
| B | Global thinking involves reflecting on a new world order when answering or contemplating a judgment. |
| C | Global thinking is always being aware of how your actions effect the world. |
| D | Global thinking is environmental conditions that exist around the world. |
| E | Global thinking is concerned with the whole picture, not just your immediate area. |
| F | Global thinking looks at all aspects of human life, nationally and internationally. |
| G | Global thinking means expanding one's perceptions to include not only local or topical perspectives on various issues, but also multinational or multicultural perspectives. |

Appendix A (continued)

| TEACHER | DEFINITION |
|---|---|
| H | Global thinking is what the world thinks about certain topics. |
| I | To define "Global Thinking," I imagine no countries, no boundaries, no religious arguments or wars. I imagine a world of people living in harmony with the natural environment and planning for health, not individual wealth. |
| J | Global thinking is a world-wide view rather than tight locale. |
| K | Global thinking is an environmental awareness involving the entire world. |
| L | Global thinking is being concerned with problems and solutions affecting all people of the planet, whether they are citizens of a major world power or citizens of a third world country. |
| M | Global thinking is thinking in terms of the macrocosmic as opposed to the microcosmic, personal thoughts. |

# APPENDIX B

## Most Serious Environmental Problem

# APPENDIX B

## Most Serious Environmental Problem

Name one pressing environmental problem facing the world today. Suggest one thing you personally can do to address this problem.

**TEACHER COMMENTS**

A A severe problem is lack of ability to properly distribute the world's food supply. There is sufficient amount of food raised and grown, and yet some starve. In many cases, this is due to inept or corrupt governments run by people who are hungry for power. The abolition of these types of governments is beyond my control, but an international concerted effort could alleviate the problem, possibly through sanctions and identification policies.

B Drugs! Martial Law!

C The production of and disposal of solid municipal waste is a problem facing the world today. One thing that I could do personally is educated my students on reducing, recycling, reusing, and recovering solid waste.

D The ozone layer is diminishing.

Appendix B (continued)

| TEACHER | COMMENTS |
|---|---|
| E | Solid waste. The waste of each home could be personally sorted into paper, aluminum, plastics, and food and placed into the correct dispenser. Encourage children to recycle and sort at a young age. Create the habit of recycling and maintaining our environment rather than changing a wasteful attitude at a later date. |
| F | AIDS. I would deal with AIDS through education. |
| G | I believe one of the most pressing problems is lack of understanding about integrated ecosystems and how influencing one's ecosystem affects others. Perhaps by publicizing the effects of pollution, over-development, and the decline of natural resources, people would tend to take more of an interest and perhaps would be moved to take some type of action. |
| H | The wasting of natural resources. If everybody would take the time to recycle, it could help save the world. |
| I | Excess level of carbon dioxide in the atmosphere which could cause global warming, melting ice caps, and severe changes in local weather and global climate. Ride my bike to work and recreate without using burning of fossil fuels. |
| J | Depletion of the ozone layer. Stop personal use of sprays. |
| K | Air pollution. Continue stressing the facts involving the harmful effects of pollution on the world level. |

Appendix B (continued)

| TEACHER | COMMENTS |
|---|---|
| L | Overpopulation. As a teacher, educate students not to be just sexually responsible, but morally responsible to their planet. Overpopulation has forced us to abuse our natural resources to keep up with demands of the billions of people needing food, shelter, transportation, etc. |
| M | The rapid depletion of forests and the "Rain Forest." Recycle cellulose products and make a conscious effort to avoid products produced on farms recently built on "Rain Forest" land. |

# APPENDIX C

## Most Serious Russian Environmental Concern

# APPENDIX C

## Most Serious Russian Environmental Concern

Please answer concisely: Because of the ecological imbalance, what environmental problem do you think is the most serious concern of the Russian people?

| TEACHER | RESPONSE |
|---|---|
| A | Lack of ability to store or do away with highly radioactive waste material in a safe and prudent way. |
| B | I have not viewed the news lately concerning the Russian people's environmental problems from their point of view. I do, however, feel that most of the "ecological imbalance" has been over-emphasized. |
| C | I have never been to Russia or met any Russian people, so I don't know. |
| D | I have no idea! |
| E | They are an "industrial nation" progressing in industry faster than progressing in "know how" of waste, pollution prevention. |
| F | Most Russian people could care less about the environment. |

Appendix C (continued)

| TEACHER | RESPONSE |
|---|---|
| G | How to balance environmental concerns such as air and water pollution with the need to develop industry, in order to move the country into the 21st century. |
| H | I have no idea! |
| I | I honestly don't know. |
| J | Radioactivity air carried pollution. |
| K | Air and water pollution. |
| L | I can't honestly say. |
| M | Pollution caused by industry (mining) and its effect on health. |

# APPENDIX D

## Pre/Post-Implementation Questionnaire

# APPENDIX D

## Pre/Post- Implementation Questionnaire

Answer the following questions using the number values listed below. Indicate your responses by circling the number which best represents your teaching of critical and creative thinking skills.

5 - Very Often 4 - Often 3 - Sometimes 2 - Seldom 1 - Rarely

**IN YOUR CLASSROOM, DO YOU.....**

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | **Use thinking skills as a base for lesson planning and development?** | 5 | 4 | 3 | 2 | 1 |
| 2. | **Teach thinking skills directly and carefully follow up student application and practice?** | 5 | 4 | 3 | 2 | 1 |
| 3. | **Encourage students to reflect on thinking processes and share insights with classmates?** | 5 | 4 | 3 | 2 | 1 |
| 4. | **Look for sources of student's error in work completed?** | 5 | 4 | 3 | 2 | 1 |
| 5. | **Enable better classroom performers to model skills for classmates and/or share effective strategies for learning?** | 5 | 4 | 3 | 2 | 1 |
| 6. | **Vary your questioning technique or discussion guidance according to student response?** | 5 | 4 | 3 | 2 | 1 |

Appendix D (Continued)

5 - Very Often 4 - Often 3 - Sometimes 2 - Seldom 1 - Rarely

**IN YOUR CLASSROOM, DO YOU.....**

| | | | | | | |
|---|---|---|---|---|---|---|
| 7. | **Encourage students to help develop teaching and testing approaches?** | 5 | 4 | 3 | 2 | 1 |
| 8. | **Reflect on your own instructional approaches and change them for greater teaching impact?** | 5 | 4 | 3 | 2 | 1 |
| 9. | **Ask other teachers to share thinking-oriented insights/experiences with you?** | 5 | 4 | 3 | 2 | 1 |

# APPENDIX E

## Pre-Implementation Questionnaire Results

# APPENDIX E

## Pre- Implementation Questionnaire Results

The following are the results from the 13 local target group of teachers. Both frequency and percentage of responses are reflected.

| | **IN YOUR CLASSROOM, DO YOU...** | Very | Often | Sometimes | Seldom | Rarely |
|---|---|---|---|---|---|---|
| 1. | **Use thinking skills as a base for lesson planning and development?** | 4(31%) | 7(54%) | 1(8%) | 1(8%) | 0 |
| 2. | **Teach thinking skills directly and carefully to follow up student application and practice?** | 3(23%) | 7(54%) | 3(23%) | 0 | 0 |
| 3. | **Encourage students to reflect on thinking processes and share insights with classmates?** | 2(15%) | 6(46%) | 5(38%) | 0 | 0 |
| 4 | **Look for sources of student's error in work completed?** | 6(46%) | 3(23%) | 4(31%) | 0 | 0 |
| 5. | **Enable better classroom performers to model skills for classmates and/or share effective strategies for learning?** | 3(23%) | 5(38%) | 5(38%) | 0 | 0 |
| 6. | **Vary your questioning technique or discussion guidance according to student response?** | 7(54%) | 5(38%) | 0 | 1(8%) | 0 |
| 7. | **Encourage students to help develop teaching and testing approaches?** | 2(15%) | 7(54%) | 2(15%) | 1(8%) | 0 |

Appendix E (continued)

**IN YOUR CLASSROOM, DO YOU....**

| | | | | | | |
|---|---|---|---|---|---|---|
| 8. | **Reflect on your own instructional approaches and change them for greater teaching impact?** | 8(62%) | 4(31%) | 1(8%) | 1(8%) | 0 |
| 9. | **Ask other teachers to share thinking-oriented insights/experiences with you?** | 5(38%) | 4(31%) | 4(31%) | 0 | 0 |
| | **Average Response** | 40 | 48 | 25 | 4 | 1 |
| | **Total Percent** | 34% | 41% | 21% | 3% | 1% |
| | **Average # of Teachers** | 4 | 5 | 3 | 1 | |

# APPENDIX F

## Attitude Survey

# APPENDIX F

## Attitude Survey

Please read each question and then decide to what extent you agree with it by circling on the answer form:

1 - if you agree
2 - if it's hard to say
3 - if you don't agree

Your candid responses will help us to understand better the way young people today are thinking about such global problems.

**STATEMENTS**

| | | | | |
|---|---|---|---|---|
| 1. | To make the world better, people must start with themselves. | 1 | 2 | 3 |
| 2. | A person should use all the natural resources available during their life time and not worry about changing their lifestyle by saving such resources for the future generations. | 1 | 2 | 3 |
| 3. | I try not to think about my future because everything will be taken care of by itself. | 1 | 2 | 3 |
| 4. | I feel that school is preparing me well for my future profession. | 1 | 2 | 3 |
| 5. | Overall, I am completely content with myself. | 1 | 2 | 3 |
| 6. | To build new nuclear power plants means to create "ecological bombs." | 1 | 2 | 3 |
| 7. | The majority of people are inclined to think more of themselves than to help others. | 1 | 2 | 3 |

## Appendix F (continued)

| | | | | |
|---|---|---|---|---|
| 8. | The day will come when the borders between countries will be abolished. | 1 | 2 | 3 |
| 9. | As a rule, I come to school in a good cheerful mood. | 1 | 2 | 3 |
| 10.. | People of different cultures and traditions can hardly be expected to get along together. | 1 | 2 | 3 |
| 11. | Any means are suitable to achieve an important goal. | 1 | 2 | 3 |
| 12. | Economic resources are not equally distributed between different nations. | 1 | 2 | 3 |
| 13. | During vacations, I miss my fellow students. | 1 | 2 | 3 |
| 14. | Humankind is more likely to perish because of total destruction of nature rather than through a nuclear bomb. | 1 | 2 | 3 |
| 15. | Our future depends on how we live today. | 1 | 2 | 3 |
| 16. | I doubt whether it's worth abolishing capital punishment. | 1 | 2 | 3 |
| 17. | A human is the most sensible being in the whole universe. | 1 | 2 | 3 |
| 18. | I have every reason to be proud of my school. | 1 | 2 | 3 |
| 19. | The scientific and technological revolution is killing nature. | 1 | 2 | 3 |
| 20. | Any sacrifice may be justified for the sake of a better future. | 1 | 2 | 3 |
| 21. | It is not necessary to attempt to retain the culture of smaller nations; it's important for mankind to save the culture of great nations. | 1 | 2 | 3 |
| 22. | People's wrong doings should not be forgiven. | 1 | 2 | 3 |
| 23. | My school helps me to better understand the surrounding world. | 1 | 2 | 3 |

## Appendix F (continued)

| | | | | |
|---|---|---|---|---|
| 24. | One should look into the future with optimism. | 1 | 2 | 3 |
| 25. | If we want to stop degeneration of humans as a species, we must isolate people with incurable diseases. | 1 | 2 | 3 |
| 26. | Some individual human sacrifices are necessary for the sake of the welfare of the majority. | 1 | 2 | 3 |
| 27. | The more rapid the technological progress, the more bland or colorless that culture becomes. | 1 | 2 | 3 |
| 28. | School helps me to understand myself better. | 1 | 2 | 3 |
| 29. | Ecological catastrophe could occur if we don't change the way natural resources are used. | 1 | 2 | 3 |
| 30. | The future is more important than the present. | 1 | 2 | 3 |
| 31. | A nation's character can be saved through isolating it completely from the influence of other nations. | 1 | 2 | 3 |
| 32. | Education is everybody's private business. | 1 | 2 | 3 |
| 33. | People, by their nature, are inclined to cooperation | 1 | 2 | 3 |
| 34. | Without control of natural resources, further development of civilization is impossible. | 1 | 2 | 3 |
| 35. | Sports competition in world events contribute to war-like behavior between peoples of different countries. | 1 | 2 | 3 |
| 36. | A disagreement between a student and a teacher is a normal situation. | 1 | 2 | 3 |
| 37. | In all the history of the world, people have done more harm to themselves than good | 1 | 2 | 3 |

## Appendix F (continued)

38. Are the questions of the test important for you personally?
YES NO

39. Have you previously thought about questions on this test?
YES NO

40. Would you please write down 10 (ten) words that indicate things or ideas that are important to you?
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

Developed by Dr. Simon Vershlovsky and collegues at the Laboratory of Sociological Porblems of Education, Research Institute of Continuing Adult Educatic n. St. Petersburg, Russia (formerly USSR) Academy of Pedagogical Sciences.

# APPENDIX G

## Global Environmental

## Problems Survey

# APPENDIX G

## Global Environmental Problems Survey

SUBJECT # CHECK ONE:_____Adult_____Student

TASK: PLEASE RANK EACH OF THE GLOBAL ENVIRONMENTAL PROBLEMS FROM (1) MOST SERIOUS TO (13) LEAST SERIOUS.

_____ 1. Ozone Depletion
_____ 2. Deforestation
_____ 3. Global Warming
_____ 4. Water Pollution
_____ 5. Acid Rain
_____ 6. Toxic Waste Disposal
_____ 7. Air Pollution
_____ 8. Solid Waste Disposal
_____ 9. Human Health and Disease
_____10. Land Use (Abuse -i.e. Wetlands)
_____11. Natural Resource Depletion (i.e. Fossil Fuels)
_____12. Animal Extinction
_____13. Global Population Growth

NOTE TO THE SUBJECT: PLEASE ONLY PARTICIPATE IN DOING ONE SURVEY.

# APPENDIX H

## Data Analysis Chart: Global Environmental Problems

# APPENDIX H

## Data Analysis Chart

## Global Environmental Problems

Teacher_____ Period_____Grade_____

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Ozone Depletion | | | | | | | | | | | | | |
| 2. Deforestation | | | | | | | | | | | | | |
| 3. Global Warming | | | | | | | | | | | | | |
| 4. Water pollution | | | | | | | | | | | | | |
| 5. Acid Rain | | | | | | | | | | | | | |
| 6. Toxic Waste Disposal | | | | | | | | | | | | | |
| 7. Air pollution | | | | | | | | | | | | | |
| 8. Solid Waste Disposal | | | | | | | | | | | | | |
| 9. Human Health & Disease | | | | | | | | | | | | | |
| 10. Land Use (Abuse) | | | | | | | | | | | | | |
| 11. Natural Resource Depletion | | | | | | | | | | | | | |
| 12. Animal Extinction | | | | | | | | | | | | | |
| 13. Global Population Growth | | | | | | | | | | | | | |
| 14. Other _____ | | | | | | | | | | | | | |

# APPENDIX I

## Simulated Earth Summit

## Lesson Plan

# APPENDIX I

## Simulated Earth Summit

## Lesson Plan

I. Student Objectives:

A. Each student is to select a country or area of the world and do a two-week independent research project.

B. Each student is to maintain a log in which to record research data.

C. Each student is to include in research the following data:
1. Geographic location
2. Population and growth statistics
3. Country status: developing or industrialized
4. Gross national product and economic status
5. Causes and effects of major enironmental problems
6. Past and present environmental interventions and government legislation.
7. Role in the Rio de Janeiro's June 1992, Earth Summit

D. Each student is to analyze, synthesize and evaluate research data and list possible solutions to global environmental problems in country researched. (critical thinking)

E. Each student is to prepare a 5-10 minute oral presentation using 3 x 5 cards and visual graphics (charts, posters, maps, tables)

Appendix I (continued)

II. Teacher Objectives:

A. Each teacher is to follow rotating schedule for use of resources and allow class time for students to work on projects.

B. Each teacher is to make arrangements to schedule library time.

C. Each teacher is to monitor journals and research being done by students.

D. Each teacher is to bring closure to research activity by having each student present reports to the class.

E. Each teacher is to select most outstanding presentations for Earth Summit.

F. Each teacher is to have students work in cooperative groups and develop lists of possible solutions to global environmental problems. (critical high-order thinking)

G. Each teacher is to meet as a group with practicum teacher to share and finalize simulated Earth Summit content and procedures.

III. Practicum Teacher Objectives:

A. Meet with participating teachers and finalize program for simulated Earth Summit and Earth Charter Resolutions.

B. Meet with students participating in simulated Earth Summit and rehearse program.

Appendix I (continued)

C. Make arrangements with media specialist to videotape and edit program.

D. Set up rotating schedule for teachers and students to use resource materials.

IV. Simulated Earth Summit:

A 12 selected student representatives from countries or areas of the world to be seated in a forum-type setting.

B. Student moderator to make welcoming statements, introduce student representatives and countries and give background of the June 1992, Rio de Janeiro Earth Summit and purpose of the Model School A's Earth Summit.

C. Each representative to give a 5-10 minute oral presentation using a podium and "The Endangered Earth" map as a backdrop. (2 days)

D. Classes participating in the Earth Summit to act as the audience and ask pre-arranged questions of the student representatives.

E. Media specialist to edit videotape presentations.

F. Media specialist to edit videotape and make copies for teachers and students to review. (day 3)

G. Students and teachers to convene in individual classrooms and use cooperative learning groups, knowledge from the presentations and brainstorming/questioning techniques to develop a list of possible solutions to global environmental problems. (day 4)

Appendix I (continued)

H. Teachers to convene as a group and compile a list of global environmental solutions/resoulutions as suggested by cooperative learning sessions. (day 5)

I. Practicum teacher to edit and finalize resolutions and print on chart paper for final follow-up concluding session to Earth Charter. (day 6)

J. Selected students to participate in the videotaping and presenting of resclutions. (day 7)

K. Media specialist to videotape and edit concluding session.

L. Copies of the video to be circulated among teachers for viewing and discussions within individual classrooms. (day 8)

IV. Resource Materials.

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Appendix I (continued)

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Environmental Almanac, World Resources Institute, Boston Mass.: Houghton Mifflin, 1992.

French, Hillary. After the Earth Summit: The Future of Environmental Governance, Worldwatch Paper 107, March, 1992.

Lemonick, Michael D. "The Big Green Payoff," Time, June, 1992. pp 62-65.

"The Endangered Earth" GTV Planetary Manager, National Geographic, 1992.

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# APPENDIX J

## Russian Students' Questionnaire

# APPENDIX J

## Russian Students' Questionnnaire

The following are questions that students from the Moscow sister school asked students from Model School A.

1. There are a lot of sunny days in Florida. How many of them are used as sources of solar energy?

2. How can you fight against depletion of beaches caused by a great number of holiday-makers?

3. How do you understand the word "ecology"?

4. Do you know why the climate has so changed in Moscow?

5. What kind of problems do you have and how do you cope with them?

6. How can you help Russia with her environmental problem?

7. Do you use the air sprays which spoil the air?

8. What is your attitude towards the removing of all wastes of the U.S. to African and Eastern countries?

9. Do the countries surrounding the Mexican Gulf pollute it and how does it influence the American coast?

# APPENDIX K

## Posttest: Global Environmental Problems

# APPENDIX K

## Global Environmental Problems Posttest

Teachers and students were each given these four essay-type, critical and creative thinking questions on a separate piece of paper:

1. In the space provided below, draw a picture or diagram showing how you think the following terms are related. Feel free to add additional words.

   sun
   rocks and minerals
   plants
   animals
   humans
   water
   air

2. Name one pressing problem facing the world today. Suggest one thing you personally could do to address this problem.

3. Draw a picture of what you think the world will look like in 2025. Write several sentences to describe what your drawing represents.

4. Automobile exhaust is the largest single source of atmospheric carbon dioxide increases which has been associated with the greenhouse effect and global warming. Imagine you have just been appointed Director of Carbon Dioxide Management for a large metropolitan area. What actions would you take to address this problem?

# APPENDIX L

## Attitude Survey Results

# APPENDIX L

## Attitude Survey Results

The Following are the results of a attitude survey showing a comparison of Moscow School 636's 9th graders and Olsen's 8th graders gifted and advanced students in issues pertaining to the environment and mankind.

| | Agree % | | Hard to Say % | | Disagree % | |
|---|---|---|---|---|---|---|
| | Mos | FL | Mos | FL | Mos | FL |
| 1. To make the world better, people must start with themselves. | 100 | 79 | 0 | 12 | 0 | 9 |
| 2. A person should use all the natural resources available during their life time and not worry about future generations | 14 | 0 | 15 | 9 | 71 | 91 |
| 3. I try not to think about my future because everything will take care of itself. | 0 | 5 | 43 | 21 | 57 | 74 |
| 4. I feel that school is preparing me for future profession. | 28 | 51 | 57 | 35 | 14 | 14 |
| 5. Overall, I am completely content with myself. | 29 | 56 | 43 | 35 | 28 | 9 |
| 6. To build new power plants means to create "ecological bombs." | 86 | 37 | 0 | 44 | 14 | 19 |

Appendix L (Continued)

| | Agree % | | Hard to Say % | | Disagree % | |
|---|---|---|---|---|---|---|
| | Mos | FL | Mos | FL | Mos | FL |
| 7. The majority of people are inclined to think more of themselves than to help others. | 43 | 49 | 57 | 40 | 0 | 12 |
| 8. The day will come when the borders between countries will be abolished. | 57 | 23 | 43 | 49 | 0 | 28 |
| 9. As a rule I come to school in a cheerful mood. | 43 | 30 | 57 | 37 | 0 | 33 |
| 10. People of different cultures and traditions can hardly be expected to get along together. | 14 | 12 | 14 | 37 | 72 | 51 |
| 11. Any means are suitable to achieve an important goal. | 43 | 21 | 14 | 58 | 43 | 21 |
| 12. Economic resources are not equally distributed between different nations. | 29 | 63 | 57 | 26 | 14 | 12 |
| 13. During vacations, I miss my fellow students. | 42 | 47 | 29 | 35 | 29 | 19 |
| 14. Humankind is more likely to perish because of total destruction of nature rather than through a nuclear bomb. | 100 | 49 | 0 | 40 | 0 | 12 |
| 15. Our future depends on how we live today. | 100 | 95 | 0 | 5 | 0 | 0 |

Appendix L (continued)

| | Agree % | | Hard to Say % | | Disagree % | |
|---|---|---|---|---|---|---|
| | Mos | FL | Mos | FL | Mos | FL |
| 16. I doubt whether it's worth abolishing capital punishment. | 57 | 33 | 0 | 53 | 43 | 14 |
| 17. A human is the most sensible being in the whole universe. | 29 | 19 | 29 | 40 | 42 | 42 |
| 18. I have every reason to be proud of my school. | 72 | 9 | 14 | 56 | 14 | 35 |
| 19. The scientific and technological revolution is killing nature. | 0 | 51 | 100 | 40 | 0 | 0 |
| 20. Any sacrifice may be justified for the sake of the better future. | 14 | 33 | 43 | 49 | 43 | 19 |
| 21. It is not necessary to attempt to retain the culture of smaller nations. | 0 | 12 | 14 | 28 | 86 | 60 |
| 22. People's wrong doings should not be forgiven. | 29 | 19 | 29 | 35 | 42 | 47 |
| 23. My school helps me to better understand the surrounding world. | 0 | 51 | 28 | 23 | 72 | 26 |
| 24. One should look into the future with optimism. | 100 | 65 | 0 | 23 | 0 | 12 |
| 25. If we want to stop degeneration of humans as species, we must isolate people with incurable diseases. | 39 | 12 | 42 | 35 | 29 | 53 |

## Appendix L (continued)

| | Agree % | | Hard to Say % | | Disagree % | |
|---|---|---|---|---|---|---|
| | Mos | FL | Mos | FL | Mos | FL |
| 27. The more rapid the technological process, the more bland and colorless the culture becomes. | 57 | 23 | 14 | 51 | 29 | 26 |
| 28. School helps me to understand myself better. | 57 | 12 | 14 | 23 | 29 | 65 |
| 29. Ecological catastrophy could occur if we don't change the way natural resources are used. | 100 | 91 | 0 | 9 | 0 | 0 |
| 30. The future is more important than the present. | 29 | 14 | 29 | 60 | 42 | 26 |
| 31. A nation's character can be saved through isolating it completely from the influence of other nations. | 14 | 14 | 29 | 30 | 57 | 56 |
| 32. Education is everybody's private business. | 86 | 21 | 14 | 28 | 0 | 51 |
| 33. People, by their nature, are inclined to cooperation. | 100 | 14 | 0 | 60 | 0 | 26 |
| 34. Without control of natural resources, further development of civilization is impossible. | 100 | 47 | 0 | 42 | 0 | 12 |
| 35. Sports competitions in world events contribute to war-like behavior between people of different nations. | 14 | 14 | 0 | 9 | 86 | 77 |

Appendix L (Continued)

| | Agree % | | Hard to Say % | | Disagree % | |
|---|---|---|---|---|---|---|
| | Mos | FL | Mos | FL | Mos | FL |
| 36. A disagreement between a student and a teacher is a normal situation. | 75 | 74 | 14 | 16 | 11 | 9 |
| 37. In all the history of the world, people have done more harm to themselves than good. | 72 | 33 | 28 | 49 | 0 | 19 |

# APPENDIX M

## Pre- and Post-Implementation Results

## Individual Teacher Analysis

# APPENDIX M

## Pre- and Post- Implementation Survey Results

### Individual Teacher Analysis

| Teacher | Raw Scores | Percentage | Percentage Increased |
|---|---|---|---|
| Teacher A | Pre: 40 out of 45 | 89% | |
| | Post: Promoted to ESE Specialist | | N/A |
| Teacher B | Pre: 39 out of 45 | 88% | |
| | Post: 43 out of 45 | 96% | 8% |
| Teacher C | Pre: 30 out of 45 | 67% | |
| | Post: 40 out of 45 | 89% | 22% |
| Teacher D | Pre: 29 out of 45 | 64% | |
| | Post: 41 out of 45 | 91% | 36% |
| Teacher E | Pre: 39 out of 45 | 88% | |
| | Post: 42 out of 45 | 93% | 5% |
| Teacher F | Pre: 43 out of 45 | 96% | |
| | Post: Transferred to Social Studies | | N/A |
| Teacher G | Pre: 33 out of 45 | 63% | |
| | Post: Transferred to Math | | N/A |

Appendix M (continued)

| Teacher | Raw Scores | Percentage | Percentage Increased |
|---|---|---|---|
| Teacher H | Pre: 28 out of 45 | 63% | |
| | Post: Promoted to Behavior Specialist | | N/A |
| Teacher I | Pre: 42 out of 45 | 93% | |
| | Post: 44 out of 45 | 98% | 5% |
| Teacher J | Pre: 36 out of 45 | 80% | |
| | Post: 41 out of 45 | 91% | 11% |
| Teacher K | Pre: 33 out of 45 | 73% | |
| | Post: 40 out of 45 | 89% | 16% |
| Teacher L | Pre: 32 out of 45 | 71% | |
| | Post: Transferred self-contained ESE | | N/A |
| Teacher M | Pre: 37 out of 45 | 82% | |
| | Post: Promoted to Assistant Principal | | N/A |
| Mean: | 14.7% | | |
| Range: | 5% to 36% | | |

# APPENDIX N

## Post-Implementation Survey Results

# APPENDIX N

## Post-Implementation Questionnaire Results

The following are the posttest results of the 13 local target group of teachers. Both frequency and percentage of responses are reflected.

| | **IN YOUR CLASSROOM, DO YOU...** | Very | Often | Sometimes | Seldom | Rarely |
|---|---|---|---|---|---|---|
| 1. | **Use thinking skils as a base for lesson planning and development?** | 9(69%) | 3(23%) | | 1(8%) | |
| 2. | **Teach thinking skills directly and carefully to follow up student application and practice?** | 9(69%) | 2(16%) | 2(15%) | | |
| 3. | **Encourage students ro reflect on thinking processes and share insights with classmates?** | 4(30%) | 8(62%) | 1(8%) | | |
| 4. | **Look for sources of student's error in work completed?** | 6(46%) | 6(46%) | 1(8%) | | |
| 5. | **Enable better classroom performers to model skills for classmates and/or share effective strategies for learning?** | 5(38%) | 5(39%) | 3(23%) | | |
| 6. | **Vary your questioning technique or discussion guidance according to student response?** | 9(69%) | 4(31%) | | | |
| 7. | **Encourage students to help develop teaching and testing approaches?** | 2(15%) | 7(54%) | 4(31%) | | |

# APPENDIX O

## Implementation Questionnaire Summary

# APPENDIX O

## Implementation Questionnaire Summary

| | Very Often | Often | Sometimes | Seldom | Rarely |
|---|---|---|---|---|---|
| Pre | | | | | |
| Total Responses | 40 | 48 | 25 | 3 | 1 |
| Average Precent | 34% | 41% | 21% | 3% | 1% |
| Average # of teachers | 4 | 5 | 3 | 1 | |
| Post | | | | | |
| Total Responses | 64 | 40 | 12 | 1 | |
| Average Percent | 55% | 34% | 10% | 1% | |
| Average # of teachers | 7 | 4 | 2 | | |
| Comparison Differences | | | | | |
| Total Responses | 24 | -8 | -13 | -1 | |
| Average Percent | 21% | -7% | -11% | -2% | -1% |
| Average # of teachers | 3 | -1 | -1 | | |

APPENDIX P

Model School A's

Earth Charter

# APPENDIX P

## Model School A's

## Earth Charter

The following are resolutions developed by the eighth grade gifted and advanced science students, regarding possible solutions to global environmental problems.

1. Under the United Nations Environment Program (UNEP), establish an international judiciary commission to regulate and enforce treaties and agreements. This commission shall be called The United Nation's Regulatory Enforcement Commission, hereafter known as UNREC.

2. UNREC to make "unannounced" regulatory inspections (to prevent recurrences as in Iraq and their attempt to develop a nuclear bomb).

3. Encourage compliance by requiring countries to submit monthly environmental reports to UNREC, so that environmental statistics become public knowledge.

4. Through UNREC, once a treaty is agreed upon, make effective provisions for updating, should new scientific information or shifting political worlds make a stronger agreement possible.

5. Petition nine (9) additional countries to sign the 1982 LAW OF THE SEA TREATY to meet the required membership of 60 countries. Ratify and revise this treaty to include management of rivers that cross national borders.

Appendix P (continued)

6. Revise the 1987 signed agreement of the MONTREAL PROTOCOL ON SUBSTANCES THAT DEPLETE THE OZONE LAW, to accelerate the phaseout of CFC's before the year 2000 and to create funds/incentives to help poor countries make the transition to CFC substitutes.

7. Solicit other North American and European countries to join the U.N.'s ECONOMIC COMMISION FOR EUROPE (ECE) for emissions control. Revise resolutions to include emissions not just on cars, but trucks, buses, trains, machinery, motors, etc. that emit sulfur dioxides and nitrogen wastes.

8. Establish a financial support structure based on GNP proportionate to population and made payable to UNREC.

9. UNREC to distribute these funds to assist:
   a. Research towards solutions to global environmental problems.
   b. Funds for grants.
   c. Establish educational resources in developing countries to increase understanding of technological advances.
   d. Funds for developing countries to buy technological equipment needed to phase-out CFC's (scrubbers, catalytic converters)
   e. Establish a GLOBAL MEDIA NETWORKING SYSTEM to inform and educate global populations; require environmental education in school curricula.

10. Establish tax breaks for non-polluting industries and for the use of recyclable products.

11. Pursue negotiations presently underway towards an umbrella biodiversity treaty that revises the existing 1973 WASHINGTON CONVENTION ON TRADE IN ENDANGERED SPECIES (C.I.T.I.E.S.), in order to adequately preserve the rapidly dwindling genetic resources.

Appendix P (continued)

12. Revamp the ANTARCTICA CLUB treaty, so that the third world countries can become active participants in the control of Antarctica.

13. Negotiate for a global forestry treaty.

14. Use the INTERNATIONAL COURT OF JUSTICE (THE WORLD COURT) at the Hague, as being mandatory to settling international environmental disputes.

# APPENDIX Q

## Resources

# APPENDIX Q

## Resources

Compuserve: Account in Russia
Prof. Oleg L. Smirnov
Institute of Automated Systems
Neszdanove St. 2A
Moscow, Russia 103009

Earthquest, Inc.
125 University Avenue
Palo Alto, CA 94301
1-415-321-5838

Florida Information Resource Network (FIRN)
Department of Education
325 W. Gaines Street
FEC B1-14
Tallahassee, Florida 32399-0400

Global Learning, Inc.
1018 Stuyvesant Avenue
Union, New Jersey 07083
1-908-964-1114

Dr. Jack Hassaard, Professor
Georgia State University
Department of Curriculum and Instruction
1-404-651-2546
FAX - 1-404-651-2546

Appendix Q (continued)

Ms. Barbara Z Presseisen
Director ...tional Networking
Researc... ...tter Schools, Inc.
444 N. Third Avenue
Philadelphia, Pennsylvania 19123

National Oceanic and Atmospheric Administration
U.S. Department of Commerce
Washington, D.C.

SimEarth
Two Theatre Square, Suite 230
Orlando, CA 94563-3041
1-510-254-9700

Sister Schools International, Inc.
Attn: Dr. Fran Winfrey
1201 N.E., 191st Street
N. Miami Beach, Florida 33179
1-305-944-0519
FAX - 1-305-944-0644

Travel Document Systems, Inc. (Visa Information)
734 15th Street, N.W.
Suite 400
Washington, D.C. 20005
1-202-638-3800
1-800-874-5100
FAX - 1-202-638-4674

Travel Insurance Services
2930 Camino Diablo
Sutie 200
Walnut Creek, CA 94596
1-800-937-1387

Worldwatch Institute
1776 Massachusetts Avenue, N.W.
Washington, D.C. 20036-1904