Global Pollution Needs a Local Solution

Russian and American Middle School Students Participate in a Videoconference

This paper discusses how Russian and American social studies educators utilized a videoconference for engaging middle school students in the study of environmental issues. The preparation for the videoconference required Russian and American students to explore human-environmental interactions in their local areas and to evaluate the impact of these interactions on the local and global environment. Students shared findings of their exploration with their counterparts in Russia during a videoconference that culminated the project. The authors discussed the preparation, administration, and outcomes of the project and included the instructional materials. The authors believe their reflective ideas provide insights on the use of videoconferencing as a means of enhancing student learning in a social studies classroom.

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Citation for this Article

Introduction

Technological advancements continuously change our lives and impact our teaching and our students’ learning. Videoconferencing is defined as conducting meetings and presentations in real time via the Internet. During a videoconference, participants sit in their respective rooms in front of a computer connected to the Internet as real-time images are projected onto a large screen. Participants communicate using Web cameras and microphones during the conference. They also can show a video or a PowerPoint presentation to their distant counterparts.

The idea of utilizing videoconferencing to connect students in various locations is not new. Kid’s Network, launched by the National Geographic Society in the 1980s, and project GLOBE, initiated in the 1990s, connected school partners from more than 100 countries (Project GLOBE, 2009). This practice proved to be effective in enhancing students’ learning (Armstrong-Stassen, Landstrom, & Lumpkin, 1998; Gerstein, 2000). Current research reports that teachers incorporate videoconferencing in their classrooms to promote the learning of big ideas in an interdisciplinary context through interaction with students from around the world (O’Steen, 2007; Siegle, 2008). This article discusses the practice of collaboration between Russian and American educators who developed and simultaneously taught an instructional segment on human-environmental interactions to their middle school students with the inclusion of a videoconference via Skype software. The authors discussed the preparation, administration, and outcomes of the project and provided relevant materials for this instructional segment. The authors believe their reflective ideas provide insights on the use of videoconferencing as a means of enhancing student learning in a social studies classroom.

Literature Review

The practice of utilizing videoconferencing for teaching and learning has become more common in recent years. Researchers discussed the use of Web cameras and various software for real-time communication in distance education (Gillies, 2008; Stafford & Lindsey, 2007), for virtual expeditions and field trips (Niemitz et al., 2008; Scott, Parr, & Richardson, 2008), and for teaching languages (Acar, 2007; Lee, 2007).

The accessibility and affordability of Skype software makes videoconferencing easy to conduct in classrooms of all grade levels. Townes-Young and Ewing (2005) discussed videoconferencing as a beneficial activity for all students because of the following assets: (1) high levels of interaction that are focused on scientific inquiry expressed in a question-answer session in real time is engaging for students of various backgrounds, including students with disabilities; (2) communication with students and adults from different countries promotes cultural awareness and tolerance; (3) discussions in real time provide opportunities for the development of listening and note-taking skills; and (4) activities that precede videoconferencing develop students’ management skills as they prepare, edit, present, and provide feedback on their experiences.

Educators reported that when students prepare their projects for videoconferencing, the high degree of collaboration that is required boosts their motivation to learn, aids their retention of the material, and provokes their curiosity to learn about the life and culture of their counterparts (Lee, 2007; Martin, 2005). Upon project completion, students benefit the experiences of document sharing, exchanging ideas, problem solving, and decision-making (Aukerman & Walsh, 2009; Siegle, 2008).

Educators also reported a number of challenges associated with accessibility and management issues they experienced during videoconferencing in classrooms. Kemker, Barron, and Harmes (2007) discussed that media tech-
technology is not easily accessible in areas having low socio-economic populations. Bell and Unger (2003) discussed that although their school had access to essential media, they found it difficult to convince the district’s technology departments to devote some of their limited resources to additional time and personnel.

Aukerman and Walsh (2009) reported that they experienced management issues during their videoconference due to poor sound quality and a noticeable delay in the audio/video streaming. To resolve these issues, facilitators asked students to verbally nominate the next speaker so as to facilitate the activity and ensure that students in each site were responding. Aukerman and Walsh also reported experiencing difficulty engaging some students who were not drawn to technology. They observed that new technology may challenge students who have limited skills in technology and, therefore, shy away from participation in a videoconference.

The authors of this paper discuss their experience of incorporating a videoconference at the final stage of a unit on human-environmental interactions in middle school social studies. Through this discussion, the authors aim to provide insights on how to overcome obstacles so that videoconferencing can be a beneficial tool for enhancing learning in social studies classrooms.

Why Videoconferencing in Social Studies?

The field of social studies is comprised of disciplines that study relationships among people, as well as between people and the environment. Learning social studies concepts contributes to the development of values that are essential for productive and responsible citizenship in a democratic society and equips learners with skills that enable them to make sound judgments and take appropriate action within an interdependent world. In order to accomplish these goals, educators consistently seek methodologies that would be effective for teaching social studies in a global context.

Robert Hanvey (1976) proposed consideration of five dimensions related to global education in social studies: (1) an awareness of and appreciation for the world cultural mosaic, (b) an in-depth understanding of existing global issues, events, and conditions, (c) an understanding of differences and similarities among world cultures, (d) knowledge of global dynamics and global change, (e) an understanding of human choices of strategies for action on issues in local, national, and international settings.

Social studies educators studied practices of infusing global perspectives into a social studies curriculum and supported the idea that teaching in a global context expands cross-cultural learning (Wilson, 1982, 1997, 1998, 2001), community building (Anderson, Nicklas, & Crawford, 1994), moral deliberation (Darling, 1995; Werner, 1990), and social participation and action (Gilliom, 1993; Pike, 2000 Pike & Selby, 1988).

Since the 1990s, there has been a growing interest in integrating computer-mediated communication as a tool for educators for accomplishing goals of teaching global issues in social studies (Zong, 2002). The efforts of technology integration were supported by constructivist theories of teaching and learning that proposed shifting from traditional teaching to facilitating students’ construction of knowledge. According to Jonassen (1999), the constructivist approach assumes knowledge to be “individually constructed and socially reconstructed by learners based on their interpretations of experiences in the world” (p. 57). Activities that involve computer-mediated communication engage learners in interaction with peers and create situations in which peers, through sharing and exchange of information, serve each other as learning resources. Therefore, engaging students in projects related to computer-mediated communication and videoconferencing with international peers may serve as another way to explore multiple views
of the world, provide them with authentic learning experiences, and engage them in the study of various dimensions of processes that occur in world communities (Duffy & Cunningham, 1996).

Computer-mediated communication offers the integration of learning activities that may correlate with the constructivist paradigm, as opposed to approaches of integration of computer-assisted technology into instruction (Mason & Berson, 2000). Videoconferencing, which became accessible and affordable in the 21st century, advanced computer-mediated communication and offered unlimited opportunities to connect people in different physical locations in real time. A review of related literature indicates that classroom teachers practice videoconferencing to connect their students with counterparts from other states as well as from around the world (O’Steen, 2007). This paper provides insights on integrating a videoconference into a social studies classroom as a culmination of an instructional segment on human-environmental interaction and discusses steps in the preparation, administration, and outcomes of the project.

**Project Description**

Three educators participated in this activity. The leading author of this paper is a faculty member at a local university who wanted to explore how to utilize videoconferencing in a social studies classroom and determine the advantages and disadvantages of using Skype as a means of videoconferencing. The second author was a consultant who volunteered to assist in teaching an instructional segment on human-environmental interaction integrating a videoconference into a social studies class at an urban middle school in the U.S. This consultant is referred to as the American project facilitator. The third author is a social studies teacher at an urban middle school in Russia. This social studies teacher is referred to as the Russian project facilitator. These three educators became acquainted several years ago through an international exchange program and now stay connected by communicating via e-mail and telephone.

The American and Russian project facilitators wanted to explore approaches that would engage their students in learning about human-environmental interactions in their local areas providing them with relevant and authentic experiences. Both project facilitators agreed to develop a project that required students to explore local environmental issues and then set up a videoconference that would culminate the project. Even though they had never used it before, the educators decided to utilize Skype software for the videoconference. To become familiar with the software, the project facilitators arranged several Skype sessions during which they discussed project objectives, procedures, and assessment techniques. Table 1 (Appendix A) contains a detailed description of the instructional planning for the project.

**The Russian Facilitator’s Story**

Russian students were excited to learn about the possibility of working on a collaborative project with American students. I invited an English teacher and a media specialist to join us in the preparation of the videoconference. A team of 18 students and 3 teachers volunteered to gather several times during and after school to work on the project.

The team decided to visit sites where we knew we could observe sources of pollution of our local water reservoirs so as to be able to discuss how human activities impact the local environment. The team was divided into three small groups according to the number of teachers available to supervise each group. These groups, using public transportation, visited and recorded observations at the sites.

Our next step was to research conditions that contributed to the environmental issues at the sites and report our findings in a video presentation using Windows Moviemaker software. Our media specialist worked with our team assisting students in conducting a video
At this stage of the project, many students were puzzled by the negative impact industrial development in the area has on water ecosystems. They commented, “Industries provide citizens with jobs and living essentials and yet, cause water, soil, and air pollution that are deadly dangerous for all living organisms in the area.”

During the videoconference itself, Russian students learned that their American counterparts observed a similar paradox: A large, industrialized city with a well-developed infrastructure experiences severe effects of environmental pollution. Students reflected on their learning during the videoconference and said, “What we learned about our local environmental problems helped us to understand issues that concerned our American counterparts.”

After the videoconference, students summarized their learning and concluded that industrial progress inevitably harms the environment. One of the typical conclusive comments stated, “To control negative impacts of industrial development, humans should be well-educated in science, and they have to consistently consider how to prevent negative impacts of industrial innovations on local and global ecosystems.”

Although the project was time consuming for teachers and students and it was difficult to schedule a videoconference due to the time difference and unpredictable weather conditions, we will continue working on similar projects in the future.

**The American Facilitator’s Story**

A consideration of innovative teaching strategies required me to discuss details of this project with my supervisors at school. I created and distributed consent forms to parents, asking their permission to utilize video equipment for an online videoconference. After parents signed and returned the consent forms, we initiated our work on the project following procedures presented in Table 1 (Appendix A).

Taking students on a field trip to visit sites where they could observe and record episodes of water pollution as a result of human- envi-
Environment interaction, did not seem realistic at my school for many reasons, including the unpredictable weather conditions. Instead, the decision was made to utilize images from various public domains available on the Internet that supported my students’ concerns about the environment in their area.

We worked on the project during regular class time for about four days. On a few occasions, some students stayed in the library and worked on their projects for an hour after school. They collected information from various sources and synthesized a report in which they addressed their concerns about the conditions of local water sources. Students decided to present their findings in an interactive slide show. I observed that my students were excited by the opportunity to apply their computer skills when they worked with the Windows Moviemaker. Students who were more skilled in the use of Moviemaker enthusiastically shared their expertise with the rest of the group.

Even though our first attempt to transmit a videoconference was unsuccessful, our second attempt was successful, and the students were well prepared and organized. Similar to the Russian project facilitator, I observed that my middle school students freely operated with the scientific terms and amply discussed concepts related to human-environmental interaction and global pollution. Prior to the videoconference, students were surprised to learn how many local industries have contributed to water pollution. They also learned how important it is not to exceed a specific amount of laundry detergent and other chemicals that many students use in their homes. This question became especially important to students because it related to their personal actions. During the videoconference, students asked their Russian counterparts whether or not they use household chemicals with consideration of the impact they have on their local environment. The response that people in Russia do not use many household chemicals and those used contain mostly natural and organic ingredients drew the interest of the American students. After the conference, they discussed how each could maintain a household in an environmentally friendly way.

When reflecting on their learning, many students mentioned that pollution is a “drawback of progress.” In addition, most of the students commented that they found the Russian students to be “well educated and well mannered.” American students were impressed that all of the Russian students were nicely dressed and were well aware of American athletes, musicians, and important features of Western culture. The students suggested that the teachers should “Allow more time for open conversation next time. Knowing more about each others’ culture and lifestyles would help in understanding environmental problems and finding solutions.”

I think we found an excellent tool to boost student motivation, and they are looking forward to learning and sharing their knowledge with their counterparts from around the world.

**Overcoming the Language Barrier**

Before the videoconference, the Russian and American facilitators discussed how to minimize any language barrier that might challenge communication. Although the Russian students worked with their English teacher preparing the speeches that would accompany their presentations, they were hesitant to speak freely and were afraid of not being able to understand the rapid speech of their American counterparts.

During the videoconference, especially in the beginning, the Russian students were reluctant to speak English. However, their well-prepared and rehearsed speeches were very helpful in facilitating the videoconference. The participation of their English teacher in the videoconference was the key to successful communication during episodes when American students used slang or Russian students did not know the meaning of American idioms. Toward the end of the videoconference, as the
Russian students overcame their anxiety and the American students adjusted to speaking slowly, the facilitators noted that a language barrier did not exist anymore. Students spoke freely to their counterparts during the informal chat, and the facilitators noticed an atmosphere of mutual understanding between the two groups.

The American team also was concerned about how to keep their students from feeling intimidated because of their inability to speak or understand their Russian counterparts during the videoconference. Since the Russian team agreed to speak English, the American students focused on learning to speak slowly and minimize their usage of slang and idioms.

Having a facilitator who spoke both languages was essential for effective communication during the videoconference. The facilitator interpreted the meaning of unclearly pronounced words or unfamiliar terms. During the informal chat, the American students were fascinated to observe how their Russian counterparts spoke both the Russian and English language simultaneously. Some Russian team members spoke English into the microphone, and, at the same time, other members of the team spoke Russian in the background.

After the videoconference, the American students expressed interest in learning a few Russian words, so they would be able to use them in another videoconference in the future.

**Conclusion**

The Skype-based videoconferencing between a group of Russian and a group of American middle school students was integrated into a middle school social studies class. This practice aimed to infuse relevant and authentic experiences into teaching concepts of human-environmental interactions in a global context.

The practice of teaching with videoconferencing, during which students presented and discussed their findings with their counterparts from around the world, stimulated their learning of concepts in a global context as well as the development of essential skills. For instance, in order to become effective participants, students needed to be able to articulate ideas and speak confidently to a Web camera and into a microphone. Many students worked on their speaking skills and practiced reciting their presentations because they wanted to be effective during the videoconference.

The work on the projects demanded that students be well organized and able to multitask as they read a chart, spoke, controlled equipment, and monitored the screen simultaneously. This project made it obvious that collaboration, organization, and management are essential components of successful project completion.

The experience of videoconferencing with Skype posed a number of questions and concerns. First, Skype may be inaccessible in many different educational settings due to security reasons and protections against computer viruses. In addition, Skype allows for the participation of only two parties in a videoconference. Also, sometimes when the connection is not stable, participants may have to restart a computer. Such incidents may negatively impact the experience and make students feel disappointed. Therefore, teachers should have a backup plan, as a substitute for an unsuccessful attempt to conference, and be able to reschedule the videoconference session on another date.

**References**


Armstrong-Stassen, M., Landstrom, M., & Lumpkin, R. (1998). Students’ reactions to the introduction of
Appendix A

Thematic Unit: Global Pollution Needs a Local Solution

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Global Pollution Needs A Local Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade Level</td>
<td>7-8</td>
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<tr>
<td>Project Description</td>
<td>There are three stages of this project.</td>
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<tr>
<td></td>
<td>1. Explore: Students work in small groups exploring current conditions of a local water source. They collect information using the Internet and local newspapers.</td>
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<td>2. Inquiry: Students select an issue and investigate this issue in depth.</td>
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<td>3. Report: Students use media tools to support a presentation of their findings and discuss their implications.</td>
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<tr>
<td>Project Objectives</td>
<td>Students will --</td>
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<tr>
<td></td>
<td>1. Collect information on economic activities in the area and the impact of these activities on the local environment;</td>
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<td></td>
<td>2. Analyze the impact of human-environmental interaction on the local environmental condition;</td>
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<td></td>
<td>3. Establish cause and effect connections;</td>
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<td></td>
<td>4. Create charts and graphs displaying this information;</td>
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<td></td>
<td>5. Present and discuss their findings with student counterparts in Russia via live videoconference;</td>
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<td></td>
<td>6. Compare and contrast their findings with the findings of their counterparts.</td>
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<td>7. Discuss solutions for how their local communities can control environmental conditions in their areas.</td>
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<tr>
<td>Standards</td>
<td>III. People, Places, and Environments</td>
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<td></td>
<td>VII. Production, Distribution, and Consumption</td>
</tr>
<tr>
<td></td>
<td>VIII. Science, Technology, and Society</td>
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<tr>
<td></td>
<td>IX. Global Connections</td>
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</tbody>
</table>
### Materials/Equipment
- Poster boards and markers
- Computer with Internet connection
- SKYPE freeware, microphone, and web camera
- Windows Movie Maker programs

### Procedures/Introduction
1. Ask students to explore current conditions of local environmental issues using Internet and local newspaper sources:

2. Divide class into small groups. Ask groups to select an environmental issue and discuss the following questions:
   - What caused the problem?
   - Who is affected by the problem (i.e., a few individuals, an entire town, the population of a country, etc.)?
   - How long has the problem persisted?
   - Can the problem be resolved in the near future or will it take a long time for a solution to take an effect?
   - Will the solution be costly?
   - How realistic is the solution?

*Formative Assessment: Check (1) students’ vocabulary knowledge and (2) comprehension of cause-and-effect relationships when they describe an environmental problem in their area.

### Development
3. As students continue working in groups, ask them to record answers to the questions above in the chart (they may use a notebook or poster board).

   Description of the issue you investigated: ________________

<table>
<thead>
<tr>
<th>Cause(s)</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effect(s)</td>
<td>1.</td>
<td>2.</td>
<td>3.</td>
</tr>
<tr>
<td>Impact(s) on humans</td>
<td></td>
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<tr>
<td>Impact(s) on animals</td>
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<tr>
<td>Impact(s) on plans</td>
<td></td>
<td></td>
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<tr>
<td>Other Impact(s)</td>
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</tbody>
</table>

*Formative Assessment: Ask students to compare and contrast their charts among the groups. Discuss similarities and differences in their responses. Check for concept comprehension and clarity of articulation.
4. Ask students to develop a brief presentation of their findings to their counterparts in Russia. These presentations will be shared during a live videoconference. Students may use *Windows MovieMaker* programs, PowerPoint presentations, or simply display their poster boards in front of the Web camera.

During these brief presentations, ask students:

- to introduce themselves;
- describe the issue their group investigated and explain why they have chosen this issue;
- report their findings and explain their meaning for humans, animals, and plants;
- suggest how the problem can be solved.

5. Conduct a live videoconference:

- set up equipment in advance
- ensure safety of all cords
- designate leaders in each group
- during the session, keep a conversation focused
- ask students to compare and contrast their environmental problems and their impacts
- ask students to evaluate each other’s solutions
- emphasize the role of citizens in solving environmental problems
- allow a brief chat to exchange questions and answers

### Assessment

*Summative assessment*

This rubric was utilized to assign a final grade for this project:

<table>
<thead>
<tr>
<th></th>
<th>Content</th>
<th>Collaboration</th>
<th>Your points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>* The issue examined in depth</td>
<td>* Group members shared responsibilities equally</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Cause and effect clearly discussed</td>
<td>during all steps of the project</td>
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<td></td>
<td>* Solutions are relevant and realistic</td>
<td>* Group members exhibited friendly and positive</td>
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<td></td>
<td></td>
<td>communication</td>
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<td></td>
<td></td>
<td>* Group members listened to each other with respect</td>
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<td></td>
<td></td>
<td>and negotiated decisions</td>
<td></td>
</tr>
<tr>
<td>Literacy skills</td>
<td>* Presentation contains relevant vocabulary</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Speech is structured</td>
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<td></td>
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<tr>
<td></td>
<td>* Participants do not interrupt each other, exhibiting good listening</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>skills</td>
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