EXPANDING GLOBAL AWARENESS: THE USE OF STUDENT–DEVELOPED MULTIMEDIA CREATED IN A COOPERATIVE LEARNING ENVIRONMENT

JANE D. STEELMAN
LISA L. GRABLE
ELLEN S. VASU

How can a classroom teacher reconcile the need for students with diverse backgrounds and abilities to master specific learning objectives within a content area with the simultaneous need for them to build their technology skills? Student-made digital multimedia could be the answer for students at all grade levels. Student achievement and effective technology integration are possible when technology skills necessary for creating multimedia are interwoven with instructional planning for the achievement of content-based objectives.[1] When the class content is aligned with rigorous academic standards, successful project completion can help increase student achievement and academic performance on high-stakes tests.[2] Multimedia projects provide a vehicle for students to use technology in an authentic context and to create an expression of acquired knowledge. Students, by constructing their own knowledge through a complex combination of experiences, resources, and tools, use digital multimedia projects as process and product to demonstrate what they have learned.[3] Students also gain a deeper level of understanding by developing their projects for a broad, even global, audience.[4] The Multimedia Mania (MM) awards program (http://www.ncsu.edu/mmania/) was conceived for this purpose.

Multimedia Mania began in 1998 and is primarily sponsored by the Hypermedia Special Interest Group (HyperSIG) of the International Society for Technology in Education (ISTE). Others who make the program possible have included the following university and corporate sponsors: North Carolina State University, *SAS inSchool*, Arizona State University, *HyperStudio*, Multimedia Design Corporation (*mPower*), *Intellitools*, *Tech4Learning*, *Expedia*, and *Macromedia*. The awards program encourages K-12 teachers from around the world to submit their students' multimedia work for competition and recognition. We believe that participation in programs such as Multimedia Mania gives students a voice within a wider audience beyond the school walls and gets them actively engaged in content that connects them to the global community.

Academic Competitions and Student-Made Multimedia

Academic competitions have existed since Roman times. In more recent history, the first national mathematics contest was held in Budapest, Hungary in 1894. Other academic competitions and Olympiads soon began, leading to the International Mathematics Olympiad hosted by Romania in 1959. Proponents of these types of competitions argue that they motivate students to perform at peak levels, as well as provide valuable feedback on their performances.[5]

Well-known academic competitions include science fairs and Olympiads, *ThinkQuest*, and *Odyssey of the Mind*. Recent studies of these competitions have found that student perceptions of the value of competitions vary depending on whether the competition is individual or team based. In addition, theses same studies have reported that students rate learning as a primary reason for participation.[6]

Teachers who choose to participate in Multimedia Mania are encouraged to place students in cooperative teams to design and create their projects, thereby minimizing competition between students within the classroom. Teachers can submit all of their students' work and/or projects from a whole class

or grade. More than competition, Multimedia Mania promotes learning through the design and development process and through the writing students do which is targeted for an audience beyond local school walls.

Multimedia Mania

International Participants and Judges

Participants and winners of Multimedia Mania are located in countries around the world, including the United States, Canada, Italy, and Australia. Participants are solicited via the MM Web site, advertisements in *Leading and Learning with Technology* (an ISTE publication), and listservs. They may register through an online form on the MM Web site. Judges are invited to participate via the Web and listservs, and also register via an online form. Virtual judging of the projects is completed using a rubric to evaluate each. The rubric used for evaluating the multimedia projects has evolved over several years through extensive revisions.[7]

The judges are volunteers who are teachers, instructional technology specialists, professors, and multimedia specialists. In recent years, the final judging has been conducted at North Carolina State University where the judges have reviewed the finalists' projects as a group using the rubric to discuss the merits of each. Each year, after much deliberation, the winning projects are selected and winners are announced. Through sponsors' funding, teachers and students who have created the winning projects at each of three levels (elementary, middle, and high school) are given support to travel to present their projects in a special session at the National Educational Computing Conference or the National School Board Association's Teaching + Leadership + Learning Conference.

Copyright Issues

An important facet of the Multimedia Mania Awards Program is to ensure that all material used in the project is either original or permission has been received for its use from the copyright owner. This is no small task. The students creating the projects learn a great deal about gathering data and inquiring about permission to use materials within their projects.

Sometimes, copyright owners decline requests they receive from a student who wants to incorporate the owner's copyrighted materials into the student's project (sound clip, photos, videos, images). When this occurs, students must alter the content of their project. This is a valuable lesson for students to learn. Fair Use Guidelines are not sufficient to cover the inclusion of the copyrighted material, due to the international distribution (via compact disk) of the MM winning projects.

Internet law is constantly being rewritten and revised. Therefore, in order to stay within the law, it is necessary to be aware of current guidelines. Many countries have joined in the Berne Convention for the Protection of Literary and Artistic Works for international copyright agreements.[8]

The following rule applies to all projects submitted to Multimedia Mania: If a copyright notice appears along side an image that a student finds on the Web, the same notice that is beside the image on the Web must be included in the students' project. If no notice appears with the image on the Web, the image can be cited according to the Modern Language Association (MLA) guidelines.[9] The reason MM requires the citation is not only to teach students how to appropriately handle copyrighted material on the Web, but also because the projects are widely disseminated at national and international conferences. If the student's project is a finalist in the MM awards program, the project will be distributed via CD, possibly placed on the Web, and shown at conferences and other locations. This goes well beyond the Fair Use Guidelines set within copyright law. Under "fair use" very small amounts of copyrighted materials may be used in a product for the specific class that the student attends or for personal use by that student in his or her portfolio.[10]

Curriculum Connections

One of the major goals of the Multimedia Mania Awards Program is to showcase real, working models of digital projects that skillfully integrate technology into traditional curriculum areas in schools in an effort to achieve content-based objectives. The technology skills acquired are not the goal for the students, but the technology does support the curricular goals and objectives being taught. All projects submitted to MM must include the learning outcomes to be achieved through the development of the project and the connection with the curriculum subscribed to by the school, district, state, or country. Many times the projects touch upon goals and objectives interwoven throughout several curricular areas. It is usually very easy to incorporate learning objectives from art, music, technology, and literature even when the major focus is social studies or history content.

In most cases, students are guided by their teachers to focus on an issue related to the goals and objectives set forth in the curriculum. The students may be allowed to select their own topic of interest within that framework, which increases student motivation. The exploration of "real world" issues makes learning relevant and connects the curricular goals to something with which the students can relate.[11]

Involvement in MM represents constructivism at its best. Student learning becomes the focus of the project and students have the opportunity to spend extensive time with a topic of interest to them, working collaboratively with other students as they develop the project. In many cases they are allowed to delve deeper into a relevant topic than would otherwise be possible. This gives students the opportunity to not only collect and review information but also to synthesize and analyze information and represent it in novel ways using multimedia. Many student teams create their own movies, drawings, and music to incorporate into the multimedia projects.

Technology Allows Unique Exploration of Topics

The use of technology may give students the opportunity to explore global issues in collaborative groups and to encourage critical thinking about "real world" problems and solutions. The development of a multimedia project to explore the topic gives students the opportunity to include textual information but also graphics, movies, sound clips, and Web links. Students entering their work have been very creative, submitting original art, music, poetry, essays, clay-mation, and dramatic presentations.

Global Issue

Global issues are included throughout the curriculum in all grades, as illustrated by the projects submitted in the Multimedia Mania Awards Program over the past five years. The social studies and history curriculum areas lend themselves well to the exploration of global topics, while integrating other areas of art, music, literature, and research methodology. The following section highlights examples of winning international projects that focused on global issues. Many other global issues have been explored through the use of multimedia and submitted as projects to the competition. Some of these include "The Civil Rights Movement," submitted by Nokomis High School, Nokomis, Illinois; "Remembering the Holocaust," submitted by Jasper Place High School, Edmonton, Alberta, Canada; and "Terrorism," submitted by Barbres Hill Intermediate School, Mont Belvieu, Texas.

Focus on Three International Multimedia Mania Projects

Elementary Division: Zero Waste (New Zealand)

Zero Waste is a cooperative project created by students attending the Tahatai Coast School in Papamoa, New Zealand. A 2001 finalist, the project was created under the direction of Andrea Sage. The software used to create the project included *Macromedia Dreamweaver*, *Fireworks*, *Apple's QuickTime*, and *Kid Pix*. The project dealt with the issue of recycling and taking personal responsibility for recycling within our global society. The students presented information on their philosophy, their inquiry into the problem, and how they would go about solving the problem.

Essentially, this environmental project was aimed at eliminating waste at their school. The information is presented on a Web site created by year 3 to 6 students (between seven and ten years old).

The goal of the project was to have zero waste for the school since items such as glass, paper, cardboard and plastic take so long to decompose. Figure 1 displays the learning outcomes for the project.

Figure 1
Learning Outcomes for Zero Waste

Teacher's Name: Andrea Sage
Project Name: Zero Waster
School & Location: Centennial Tahatai Coast School, New Zealand
Age of Students: 7-10 years

The learning outcomes for the children who participated in the project were
1. To develop their knowledge and understanding of the issues surrounding the preservation of our natural resources through online and hands-on learning.
2. To develop a presentation which could persuade people both locally and internationally of the importance of preserving our planet.
3. To create an eye-catching, interactive Web site which would appeal to as large an audience as possible.
4. For the children to consider a means of advertising their Web site to ensure that their message got through to as wide an audience as possible.

Many activities were included in the Zero Waste project. Students made costumes for plays from recycled materials. They used the costumes created in a school-wide assembly focusing on zero waste for the school. Students created digital artwork and an interactive story about the fate of the planet. The students read a story entitled "Stig of the Dump" and then created a slide show to tell younger students about the book. They also designed a scientific experiment to explore what Stig could have worn from the dump in order to keep warm.

This site was divided into a kids' section and an educators' section. The kids' section focused on the activities used to promote awareness of the global issue of taking responsibility for our planet. The educators' section included the philosophy, overview, timelines, lesson plans, and newsletters.[12]

Middle Level Division: Land Mines (Canada)

The Landmines project was developed using *HyperStudio*, *Specular Infini-D*, *Adobe Premiere*, *Virtus VR*, *QuickTime VR*, and *Corel Bryce*. The project was developed by a team of two students in grades 7 and 8 (middle grades winner in 2000) under the guidance of Arnie Covey at Centennial Public School, Waterloo, Ontario, Canada.

The subject matter of this project was both relevant and moving. The students explored the topic of landmines, including the victims, countries affected, types and purpose of landmines, the banning landmines initiatives, and information on how to de-mine. Many graphics and movies were used to explore the topic. The movies of the victims are particularly powerful.

The students spent much time gathering information and gaining copyright clearances from such organizations as the Canadian and American Red Cross, Mines Action Canada, The Department of Foreign Affairs and Trade, The Campaign to Ban Landmines, The Landmine Survivors Network, Project Ploughshares, UNICEF and the United Nations. The students not only gained information and insights regarding landmines through the development of the project; they were also invited to participate in activities related to banning and de-mining of landmines. The development of the project also precipitated important contacts for further exploration of the topic. For example, Rochelle Johnston, of the Red Cross and a landmine activist herself, put the student team in touch with the 1997 Nobel Peace Prize co-winner Rae McGrath, who subsequently visited the school. Learning outcomes for the project appear in Figure 2.

Figure 2
Learning Outcomes for Landmines

Teacher's Name: Arnie Covey
Project Name: Landmines
School & Location: Centennial (W) PS, Waterloo, Ontario, Canada
Age of Students: 14

The Landmines CD-ROM provides the user with an overview of the issues surrounding landmines. The highlights include the impact on victims, the types of landmines, de-mining, countries affected by landmines, banning landmines and why landmines are used. The CD contains animations, digitized movies and simulations.

The project was dedicated to Princess Diana for her work in raising awareness of the problems of landmines across the world and efforts to ban and de-mine. The Landmines Project, developed by a collaborative team of middle level students, very effectively explored a topic of global significance.[13]

Upper Level Division: A Century of Women—An Inquiry into the Emancipation of Italian Women (Italy)

The project "A Century of Women: An Inquiry into the Emancipation of Italian Women in the 20th Century" was a collaborative exploration of a topic of global interest. The project, created under the direction of Giulio Toffoli, at Liceo Scientifico "N. Copernico," Brescia, Italy, was the upper-level winner in 2002. High school students, typically ages sixteen through eighteen, compete in the upper-level division. The software used to create the project included *Macromedia Dreamweaver* and *Flash*.

The living history explored by the students, through interviews, photographs, and analysis of the data collected, provided a unique perspective on Italian history and the role of women in that society and culture through the twentieth century. Any student of history would value this collection of rich information that was collected and presented using a myriad of multimedia. The photo tour in the project featured a rich collection of personal photographs, collected by the students, of women of all ages. Over sixty women from different generations were interviewed during the data-collection process. The students analyzed the moral and cultural heritage of their relatives who were born in 1920's Fascist Italy through the 1980s. The learning outcomes for "A Century of Women" appear in Figure 3.

Figure 3
Learning Outcomes for A Century of Women

Teacher's Name: Giulio Toffoli
Project Name: A Century of Women–an inquiry into the emancipation of Italian women in the twentieth century.
School & location: Liceo Scientifico "N. Copernico," Brescia, Italy.
Age of the students: 17-19

1. Learn to critically face a cultural problem (critical thinking).
2. Read the historical experience of one's own family as part of a larger historical experience.
3. Learn to work as a team, to organize research and to develop a multimedia approach to a project.
4. Learn to use a multimedia language and establish a relationship between traditional forms and the new technologies.
5. Acquire the basic ability to work with multimedia languages.
6. Acquire the ability to meet a strict deadline with a quality project to be verified by highly qualified independent judges.

The entire class participated in the creation of the project that used a cross-disciplinary approach. Many teachers found the content and the methods appropriate for the content areas they taught. Some of

the curricular areas the project explored included art, literature, and religion, as well as history and the feminist perspective. The music that accompanied the information added a media element to the uniquely Italian presentation. The goal was to explore history in the context of women's political and social experiences and determine the relationship of these microhistories to history in general. Another very interesting feature of the Italian project was that it was created in both Italian and English. Students not only practiced their translation skills but also provided a project that was truly international.

Conclusion: Using Multimedia Mania to Explore Global Issues

Throughout the years of being involved with the MM program, we have seen how students and teachers utilize multimedia tools to develop powerful digital presentations or instructional sequences using global issues as the content. Often projects are multidisciplinary, international, and include varied subject matter that meet goals and objectives in several content areas. Students are given the opportunity to delve deeply into a topic of vital interest to them and learn to work together as teams using the skills and strengths of each member.

The multimedia authoring tool becomes the vehicle for exploring the topic and presenting information in such a way that allows the students to analyze and synthesize the data. The use of the Multimedia Mania Awards Program broadens the audience to include the international community. This digital bridge building allows the learning experience to become more "real world" and gives it a purpose beyond that of the classroom. The winning entries gain much recognition since they are distributed worldwide on a professionally produced CD through HyperSIG and ISTE. Through the Multimedia Mania Awards Program, students promote global understanding of issues they explore through the sharing of their digital curriculum-based projects.

Acknowledgements and Additional Resources

This article benefited from the research assistance of Kat Belk and Chris Shearer. The North Carolina State Multimedia Mania team members who have contributed to the success of the awards program include Caroline McCullen (*SAS inSchool*), Betty Bean, Judy Lambert, Nancy Hook, Amy Vanlerberghe, and Ji-eun Suh. For more information about the Multimedia Mania awards program; to view some of the winning projects; or to sign up to be a judge simply visit the MM Web site. To join HyperSIG, visit the International Society for Technology in Education Web site.[14]

NOTES

1. Y. Zhao, K. Pugh, S. Sheldon and J. L. Byers, "Conditions for Classroom Technology Innovations," *Teachers College Record* 104, no.3 (2002): 482-515.

2. J. Cradler, M. McNabb, M. Freeman and R. Burchett, "How Does Technology Influence Student Learning?*" Learning & Leading with Technology* 29, no. 8 (2002): 46-49, 56.

3. S. Adams and M. Burns, *Connecting Student Learning and Technology* (Austin, Tex.: Technology Assistance Program, Southwest Educational Development Laboratory, 1999); J. Brooks and M. G. Brooks, *In Search of Understanding: The Case for Constructivist Classrooms* (Alexandria, Va.: Association for Supervision and Curriculum Development, 1993).

4. L. P. Rieber, J. Davis, M. Matzko, and M. Grant, *Children as Multimedia Critics: Middle School Students' Motivation for and Critical Analysis of Educational Computer Games Designed by Other Children*, (Seattle, Wash.: American Educational Research Association, 2001); Lloyd Rieber, Nancy Luke, and Jan Smith, "Project KidDesigner: Constructivism at Work Through Play," *Meridian* 1 (1998), http://www.ncsu.edu/meridian/jan98/feat_1/kiddesigner.html.

5. T. V. Abernathy and R. N. Vineyard, "Academic Competitions in Science: What Are the Rewards for Students?" *The Clearing House* 74, no. 5 (2001): 269-76; T. Verhoeff, "The Role of Competitions in Education." (Cape Town, South Africa: Future World International Conference, 1997).

6. T. V. Abernathy and R. N. Vineyard, "Academic Competitions in Science."

7. The rubrics are available at http://www.ncsu.edu/midlink/rub.multi.htm.

8. Information on the Bernie convention is available at http://www.wipo.int/clea/docs/en/wo/wo001.htm.

9. Guidelines are available at http://www.ncsu.edu/midlink/citing. html#ANY.

10. Those interested in this very complex issue of copyright regulations may find the following Web sites helpful: http://www.ncwiseowl.org/reference/citations.htm; http://www.unesco.org/culture/copyright/index.shtml.

11. James Beane, *Curriculum Integration: Designing the Core of Democratic Education* (New York: Teachers College Press, 1997).

12. The Web site is still active and may be found at http://tahatai.school.nz/mainpage.html (click on "About Us" and "Projects").

13. More information about the making of the landmines project may be found at http://www.7-8.8m.com/landscape.html.

14. The MM Web site is available at http://ced.ncsu.edu/mmania/ and to join the HyperSIG visit the ISTE Web site at: http://www.iste.org/hypersig/.