Omaha SCIENCE MEDIA PROJECT

Compilation of Evaluation Reports 2009-2010

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UNIVERSITY OF Nebraska Lincoln

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Executive Summary

The Omaha Science Media Project (OSMP) is a two-year project funded by the Omaha Schools Foundation to enhance Omaha Public School (OPS) teachers' understanding of scientific research. The underlying concept of this collaborative initiative is to use media production, including radio, video and multimedia, to enhance teaching and learning about science and scientific research. The hypothesis underpinning work of the OSMP is that science teachers can improve their science pedagogy by participating in intensive professional development experiences during which they produce media deliverables focused on the latest biomedical research topics. OSMP project leaders anticipated that student learning and interest in science and health careers would increase as teachers infused their new knowledge into the classroom.

The OSMP conducted two summer professional development workshops during the course of the project. The first, in July 2009, was a two-week, intensive immersion workshop involving sixteen teachers and fifteen students. Small teams of teachers, students, and media professionals interacted with scientists to create 8-10 minute professional quality media products about different virology topics. A second workshop, in July 2010, complemented the structure of the first workshop, using a one-week format, simpler media tools and more closely simulating a classroom environment with students. Twenty-one teachers developed media-based lessons and guided student teams as they created short, 2-3 minute media products.

Both project evaluation and learning research were used to study and assess impacts of the project. The learning research group conducted clinical interviews with students, teachers, and virologists to characterize their reasoning about viruses. Their work will provide a basis to understand how different educational materials and experiences may influence learners understanding about viruses. Results from those studies are presented elsewhere through professional publications and presentations. The current report summarizes and compiles the evaluation studies into a single document. Evaluation was conducted throughout the project, providing data to guide planning and management decisions, assist in record keeping, and assess the overall effectiveness and impact of the project.

In sum, these evaluation studies provide a picture of a project that has made an impact in the Omaha Public Schools classrooms. At an individual teacher and classroom level, science media creation is being integrated in student lab assignments, demonstration projects, reports and assessments. Teachers are creating media themselves to introduce ideas and spark classroom discussions, and their students are creating media to communicate their learning to their fellow students as well as their teachers. Participants reported renewed enthusiasm for teaching, and felt that science media offered unique benefits, by creating opportunities for making science more relevant and meaningful to students. Across the curriculum, use of media and journalism story-telling techniques are being shared among teachers within schools in other subject areas. At the district level, a community of science media educators has grown, with increased skills and experience, access to equipment and other resources, and collaboration among colleagues.

Omaha Public Schools has made a commitment to integrate the original media products created at the 2009 OSMP workshop within curricular units, and they are available to all OPS teachers through their online resource bank. Lesson plans developed at the 2010 OSMP workshop were shared among the participants, and nearly all the teachers anticipated using multiple lessons that they and their colleagues had created.

Whether or not test gains on district assessments may eventually be an outcome of this project, the teachers involved in this project feel they are now more able to help their students see the relevance of science to their lives, and to apply and demonstrate their learning in new ways. It is another tool for teachers to connect with students, and for students to connect to science. Feedback from the teachers indicate that the project provided them with additional motivation and enthusiasm for teaching, and gave them new skills with respect to incorporating media and storytelling techniques to make science more meaningful to their students. As teachers individualize their use of media in the classroom, diverse practices continue to emerge and develop. This project initiated and supported important change for many teachers in the district, and impacted the district itself. The Omaha Science Media Project helped ensure that science media learning will be part of OPS science classrooms for years to come.

Overview of OSMP Evaluation Reports

Project Description

The Omaha Science Media Project (OSMP) is a two-year project funded by the Omaha Schools Foundation to enhance Omaha Public School (OPS) teachers' understanding of scientific research. This collaborative initiative involves OPS, University of Nebraska Medical Center, Nebraska Center for Virology, Center for Biopreparedness Education, Nebraska Educational Telecommunications, Soundprint Media Center, Inc., University of Nebraska-Lincoln College of Journalism and Mass Communications, University of Nebraska State Museum, and the Center for Multidisciplinary Programs in Education Sciences at Northwestern University. The underlying concept of the OSMP is to use media production, including radio, video and multimedia, to enhance teaching and learning about science and scientific research. The hypothesis underpinning work of the OSMP is that science teachers can improve their science pedagogy by participating in intensive professional development experiences during which they produce media deliverables focused on the latest biomedical research topics. OSMP project leaders anticipated that student learning and interest in science and health careers would increase as teachers infused their new knowledge into the classroom.

Project Goals

The project goals articulated by the leadership team were to:

- produce high-quality, classroom-ready media products about virus topics that were relevant to students in middle and high school
- improve the pedagogy of science and journalism teachers through an experiential professional development program
- establish the foundation for long-term partnerships between Omaha Public Schools and Nebraska's biomedical institutions
- explore media creation as a strategy for making science relevant for students

Workshop Descriptions

The OSMP conducted two summer professional development workshops during the course of the project. The first, in July 2009, was a two-week, intensive immersion workshop involving sixteen teachers and fifteen students. The second workshop, in July 2010, was designed to complement the first workshop and featured returning OSMP participant teachers as mentors for their peers. See Table 1 below contrasting aspects of the two workshops. The attached evaluation reports from these workshops also provide more details about the content, goals, and structure of the workshops.

Table 1. Comparison of 2009 and 2010 OSMP Workshop Characteristics

Workshop Characteristic	**2009**	**2010**
Length	2 weeks	1 week
Participant Numbers	16 teachers, 15 students	21 teachers, 41 students
Content	Focused on virology research	Broad range of science concepts
Access to Researchers and Scientists	Very high	None
Technology (hardware and software)	"Prosumer" level	Consumer level (flip cameras, teachers' own equipment)
Production Teams	Integrated student/teacher	Teacher teams; student teams
Student Teacher ratio	1:1	2:1 or 3:1
Team size	2 teachers, 2 students	2-3 students per group
Mentors	1 journalist, 1 scientist per team	Returning OSMP teachers mentor newcomers
Teacher role	Active team members, peers to students	Coach students in content and technology
Choice of topics	Teachers choose from list of virology research topics	Teachers generate in any area of science
Setting	University of Nebraska Medical Center	Benson High School Magnet computer lab
Science research immersion	yes	no
Unstructured time	Minimal	Built-in component
Deliverable	5-8 minute high quality video about a virology research topic	2-3 minute student-generated video on a science topic
Goals	❑ Improve the capacity for OPS teachers to improve the science teaching through integration of media. ❑ Improve the performance of OPS high school students in standardized tests and science courses ❑ Create a pilot program focused on virology to enhance students' career interests in biology and health sciences. ❑ Leverage media to enhance science learning. ❑ Establish the basis for long-term partnerships between Omaha Public Schools and Nebraska's biomedical institutions (e.g., UNMC and UNL).	❑ Complement 2009 workshop by emphasizing process of creating media ❑ Simulate classroom conditions where possible ❑ Grow the cohort of innovative science teachers in OPS

The first workshop included the guidelines with respect to outcome goals for both science and media learning (see Table 2).

Table 2. Science learning and media learning outcomes given to each team at the 2009 OSMP workshop

SCIENCE LEARNING OUTCOMES Youth develop an understanding of …	**MEDIA LEARNING OUTCOMES** Youth develop an understanding of….
1. What is a virus?	1. How do you plan and research to tell a science media story?
2. How do viruses reproduce inside a cell?	2 How do you record a science media story using a variety of devices?
3. How do viruses spread from one individual to another?	3. How do you gather material and edit that material into a science media story?
4. How do viruses evade host defenses?	4. How do you share a science media story with peers, teachers, and parents?

Context and Goals of Evaluation and Learning Research

The project utilized both traditional evaluation methods and innovative learning research to assess the impact of the project. The evaluation and learning research team included the following individuals:

Amy Spiegel, Ph.D., Research Associate Professor
Center for Instructional Innovation, University of Nebraska-Lincoln
David Uttal, Ph.D., Professor of Psychology & Learning Sciences, Director of the Multidisciplinary Program in Education Sciences, Northwestern University
Benjamin D. Jee , Ph.D., Postdoctoral Fellow, Department of Psychology, Northwestern University
Kristin Watkins, MBA., Librarian/Grants Coordinator
Center for Biopreparedness Education
Caroline Crouch, Lab Manager and Research Technician
Department of Psychology, Northwestern University

The evaluation studies provided data to assist with planning and design of the workshops, and provided feedback about the more immediate impact of the workshops on the involved teachers and their classrooms. The purpose of the program evaluation was to guide planning and management decisions, assist in record keeping, and assess the overall effectiveness and impacts of the project. The evaluation plan included data gathering throughout the project (see Table 3 for timeline and list of evaluation studies planned and undertaken). This report is the compilation of all the formal evaluation reports produced for the project.

Table 3. OSMP Evaluation Plan

Timeline	**Data Collection & Sample**	**Report/Publication/Use**
Pre 2009 Workshop	Front-end Virus Survey for Teens: 126 8th & 10th graders	World of Viruses Front-end Teen Survey Report (Apr, 2009)
	Survey of media experience: 18 OSMP Teachers	Feedback to OSMP management team (May, 2009)
During 2009 Workshop	Written and verbal feedback on workshop experiences: 16 OSMP Teachers 15 OSMP Students	OSMP 2009 Workshop Evaluation Summary Report (April, 2010)
Post 2009 Workshop	Follow-up survey on classroom impact of OSMP Workshop: 13 OSMP Teachers	2009 Workshop Follow-up Report: Teachers' Plans and Activities Using New Science Media Skills (Nov, 2009)
During 2010 Workshop	Written feedback on workshop experiences and one-year follow-up on returning teachers	OSMP 2010 Workshop Evaluation: Teacher Survey Results (Nov, 2010)

The cognitive learning research assessed and characterized people's beliefs, attitudes, experiences, and reasoning about viruses through semi-structured interviews. The aim is to capture people's mental models of the invisible, microbiological processes that underlie viral infection, replication, transmission, and other phenomena. Groups of high school students, teachers, and professional virologists participated in the learning research, allowing examination of differences in the breadth and depth of knowledge across levels of expertise. By shedding light on people's virology-related mental models, this learning research will provide a basis to understand how different educational materials and experiences, such as participation in the Omaha Science Media Project, influence learners' beliefs, attitudes, and reasoning about viruses. Findings from the cognitive learning research have been presented in professional presentations and publications, and more will be forthcoming. Table 4 below provides details about the data collection for the learning research studies that were planned and undertaken.

Table 4. OSMP Cognitive Learning Research Plan

Timeline	**Data Collection & Sample**	**Presentations and Publications**
Pre 2009 Workshop	Clinical Interviews: 18 OSMP Teachers (pre)	Jee, B. D., Uttal, D. H., Crouch, C., Spiegel, A., & Diamond, J. (2010). *Mental models of virology in experts and novices.* Paper presented at the 32nd Conference of the Cognitive Science Society. Portland, OR. Jee, B. D., Uttal, D. H., Spiegel, A., & Diamond, J. (2010, May). *Understanding the microbiological world: People's beliefs and reasoning about viruses*. Paper presented at Annual Meeting of the Midwestern Psychological Association. Chicago, IL. Jee, B. D., Uttal, D.H., Spiegel, A. & Diamond, J. (2009) Students and Teachers' Mental Models of Viruses. *Society for Research in Child Development*, San Antonio, TX. Manuscript submitted for publication (TBD)
During 2009 Workshop	Clinical Interviews: 13 OSMP students	
Post 2009 Workshop	Clinical Interviews: 16 OSMP Teachers (post) 4 Virology experts 9 OPS Control Teachers (pre/post)	

Listing of Evaluation Reports

This report compiles all the evaluation reports produced for this project. In addition to the studies conducted by the evaluation team listed, the Omaha Public Schools Division of Research also conducted a study assessing changes in student achievement as a result of participation in the OSMP. This report is included here as well. The evaluation reports included in this final evaluation report are

- World of Viruses Front End Evaluation Report (Teen Survey)
- Teacher Pre-Workshop Media Survey
- 2009 Workshop Evaluation Summary
- 2009 Workshop Follow-up: Participating Teachers' Plans and Activities Using New Science Media Skills
- Omaha Science Media Project Evaluation (Document Produced by the OPS Division of Research on Student CRT scores)
- 2010 Workshop Evaluation: Teacher Survey Results

Summaries of Evaluation Reports

While the full evaluation reports are all included as part of this document, brief summaries of each of these reports are provided below.

World of Viruses Front End Evaluation Report Summary

Produced for both the Omaha Science Media Project and the associated World of Viruses (WoV) project, this report provided baseline and planning data about youths' understanding of viruses. A survey of mostly open-ended items was designed around ideas central to a basic understanding of viruses. The brief, one-page survey was administered in science classes to a total of 126 middle and high school students, ranging in age from 13 to 16 years, from public schools in Lincoln, Nebraska.

The majority of students responding to this survey had a basic grasp of virus as disease agents and knew that viruses are found in animals and in the air. One third described viruses as attacking cells, and one one-fifth mentioned the role of the immune systems or white blood cells in fighting viruses. A much smaller number identified the need of a virus for a host, named specific viruses and/or noted that viruses have their own genetic material. The majority of students were able to correctly identify images of viruses, but many also incorrectly identified images of a cell and bacterium as viruses.

Students had many questions about viruses. The most frequently asked questions were about the origin, survival or fundamental functions of viruses, like "where do they come from?" Other questions pertained to personal health and protection, such as how to avoid getting them. Students also wanted to know about virus identification, and about virus behavior and pathogenicity.

Overall, these teens indicated an interest in and a familiarity with viruses. The vast majority were able to offer some relevant information about viruses, and a smaller subset displayed a basic understanding of what a virus is, how viruses cause disease and how vaccines help control them. There were, however, significant gaps in knowledge for many of these students and some misconceptions. The results illuminated both strengths and weaknesses in student understanding and provided useful data to guide project decisions.

Teacher Pre-Workshop Media Survey Report Summary

This brief report summarizes a PowerPoint presentation given in May 2009 to provide planning data for the 2009 Summer Workshop. This teacher pre-workshop media survey was undertaken to gain a better understanding of the experience levels and confidence of the teachers selected to participate in the Omaha Science Media Project with respect to using, creating and leading students with media projects. These data also helped to identify specific technologies where additional training might be needed. More detailed tables and all qualitative data with specific information about particular equipment and software the teachers had used were provided directly to the media professionals on the project to use and refer to as needed. This report provides a summary of brief, descriptive data provided to the entire management team at a planning meeting.

The survey data indicated that the teachers selected for OSMP included science teachers (72%), journalism teachers (17%) and technology teachers (11%), and that 20% also taught other topics. They ranged in their experiences in using media, but nearly all felt that using media was "very beneficial" for both their teaching and their students' learning. The majority of teachers indicated they were "a little nervous" or "mostly confident" in directing students to create media products, but up to 40% were "not at all confident" or "apprehensive." Teachers' highest level of experience was in taking digital photographs and the lowest level was in creating audio products and creating webpages of any kind.

2009 Workshop Evaluation Summary

The Omaha Science Media Project (OSMP) involved sixteen Omaha Public School (OPS) teachers and fifteen Omaha Public School students in an intensive, collaborative two-week summer workshop about viruses and infectious disease in July 2009. Teaming up with media professionals and content specialists, these teachers and students worked as "science journalists" to create media productions (audio, video, and multimedia) focusing on different virology topics. The goals of the project were 1) to produce high-quality, classroom-ready media products about virus topics that were relevant to students in middle and high school and 2) to improve the pedagogy of these teachers through this experiential professional development.

At the conclusion of the workshop, both teachers and students completed a written survey about their experiences. Feedback from the surveys indicated that the workshop was very well received by both the teacher and student participants. The inclusion of students proved to be an important element in the process of creating the media and the resulting product. The teachers reported that they learned many valuable skills that they anticipated incorporating into their own classrooms. They expect to increase student involvement and motivation through the use of media, and they envision making curriculum improvements in their schools. Teachers also felt that they improved their skills in using a story-telling process and their skills in working with a diverse group. Most of the teachers felt strongly that the contributions of the students resulted in more relevant media products, and the students felt they were valued team members. The students experienced positive attitudinal changes as a result of their participation and reported an increase in self-confidence and in their interest toward science media and technology. In addition, teachers had a renewed appreciation for the student perspective, and said they could see the impact of making content relevant to their students.

The opportunity to interact with the scientists, media experts, and to collaborate in teams with the other participants were cited by both students and teachers as highlights of the workshop. The participants also felt that learning more about media and technology was one of the primary benefits of their participation.

For future workshops of this nature, some lessons learned emerged from this evaluation. First, the general format and purpose of the workshop was a strength. The creation of small teams of teachers and students working together to create a media product, and providing them with support and guidance from media experts and a content mentor, with access to scientists, resulted in a productive, workable structure. Including the students as contributing members of the team was identified as a key component in making the media products relevant to a student audience. However, group dynamics emerged as a barrier to productivity and cohesiveness for some groups. The collaborative process for some teams might have been enhanced with some brief preparation about group process and providing concrete strategies for working together. Finally, teachers wanted to come away from the workshop with more skills in working with the media technology and felt that they needed more hands-on time to learn to use the media tools. This could be accomplished by a pre-workshop introduction with a small assignment using the actual equipment, more time built into the workshop for teachers to use the tools, or a different division of labor with the students. In addition, using simpler media tools that required less expertise would have reduced the learning curve and allowed for faster mastery of the equipment and software. Overall, the three key features of this workshop, participant immersion, student inclusion, and the goal of media products, all appear to have been important contributing factors to the success of the workshop.

Overall, the Omaha Science Media Project 2009 summer workshop was a successful, enjoyable, and productive experience for the participants. The general format with the teams creating media products was a strength, and the inclusion of students was a central component of the success of the products. Participant immersion allowed for intense and productive group worktime, and the finishing of the products after the completion of the workshop allowed for a final, polished product to result.

2009 Workshop Follow-up Report Summary

In late September 2009, ten weeks after the completion of the workshop and six weeks into the new school year, the Omaha Science Media Project conducted a professional development session as part of an OPS curriculum day. Fourteen of the 16 OSM participant teachers attended the OSM session, which included time to verbally share with one another their current plans for incorporating new "science media" into their classrooms. We also asked them to write down their activities and plans as they move forward in the school year.

Thirteen teachers provided written summaries of what they are currently doing or planning to do in their classrooms and schools using their new journalism, science, and media skills. Of these teachers, the following percentages indicated that they are working on or toward these new activities:

100%	incorporating student-generated media production in my curriculum
54%	working with other teachers to help them learn more about journalistic techniques and media production
85%	creating new media products to use with my students
85%	using my new skills to enhance the curriculum
23%	other changes in my school
15%	other changes outside my school

In their verbal and written descriptions, teachers provided some detail about their work, their plans, and some of the barriers they face. Many teachers were already using their new skills, citing some specific activities using media and story telling techniques. Teachers planned on creating media themselves to use with their students and on having students create media for assignments, for other students and as a means of assessment. Teachers also anticipated changes beyond their classrooms, in collaborating with colleagues, blogging, and continuing partnerships that began at the OSMP summer workshop.

While some of these teachers were able to immediately incorporate more media creation in their work with students, others expressed the need for additional and ongoing support, including the need for additional guided, hands-on time with the technical tools. Other identified barriers included lack of time, both to plan and to fit activities into the curriculum, and lack of equipment to engage all students. Overall, however, the OSM participating teachers continued to express their enthusiasm for their new skills and a desire to incorporate what they've learned and bring technology into their science classrooms. This report recommended that creating more opportunities for these teachers to communicate and share with one another would enhance the ability of these teachers to implement and sustain the integration of these new science media skills in their schools.

Omaha Science Media Project Evaluation Summary (OPS Division of Research Report)

This report summarizes the student data that was analyzed to assess the effectiveness of the Omaha Science Media Project workshop. These analyses were conducted and written up by the Omaha Public Schools Division of Research.

Two types of analysis were conducted. The first type of analysis, called student-level analysis, examined the impact of the workshop on the student participants in the 2009 OSMP Summer Workshop. The second type of analysis, called teacher-level analysis, focused on the students of the teachers who participated in the 2009 OSMP Summer Workshop.

Student-level analysis: Using a comparable group of OPS students as a control group, differences in selected science criterion reference test scores were examined. A significant difference was found on one measure, the overall AYP score, however, this was attributed to prior science proficiency rather than OSMP participation.

Teacher-level analysis: To assess whether OSMP participation of teachers influenced their students' CRT scores, students of nine of the OSMP teachers prior to their participation were compared with students who had those teachers after the their OSMP participation. These student averages were also compared to district averages. Results were mixed (positive and negative change), with significant differences across multiple grades and standards. Although 8th graders taught by OSMP teachers improved after OSMP participation, 7th and 9th graders did not. Both 8th and 9th grade students taught by OSMP teachers had higher overall AYP scores than the district averages, but this was true both before and after OSMP participation. Seventh graders, on the other hand, did better than the district average prior to their teachers' OSMP participation, but worse afterward.

2010 Workshop Evaluation Summary

OSMP leaders and staff initiated a second workshop, OSMP 2010, based on feedback and reflection on the 2009 workshop, program goals, and available resources. While the overarching goal of infusing journalistic media skills into science teaching remained consistent, OSMP staff structured this second workshop somewhat differently. Prior to the workshop, teachers identified topics they found challenging to teach in the past. During the one-week workshop, teachers focused on this content, working in small group production teams. This workshop did not include science research immersion, and the teachers did not have direct access to science researchers or content experts. Media mentors were available but did not serve as members of production teams. Returning teachers from the 2009 OSMP workshop served as mentors for their colleagues, and the 2010 participating students were involved in a role more similar to a typical classroom situation, rather than as peers with the teachers. The goals of the 2010 workshop complemented the 2009 OSMP workshop by focusing on teachers creating media and simulating a classroom environment with students, and continuing to grow the cohort of innovative science teachers in OPS.

This evaluation describes the feedback provided by the 2010 OSMP workshop participants, including the returning 2009 participants. The goal of this report is to help the project staff, the funding agency, and other educators and administrators better understand participants' experiences and provide relevant information for planning future teacher workshops incorporating media production. This report reflects on the process and considers some of the strengths and challenges of the 2010 summer workshop and the project as a whole.

Twenty-one teachers participated in the 2010 OSMP workshop, including ten returning 2009 OSMP participants, and all of them completed an evaluation survey at the conclusion of the workshop. In their responses, all of the teachers indicated that the lessons they had developed during the workshop would fit within their current course plans, and 84% of the teachers also planned on using some of the lessons developed by their OSMP colleagues.

A strength of the 2010 OSMP workshop was having the participating teachers select the topics they would develop into media lessons during the workshop. This insured that the lessons were relevant and fit within the curriculum and the teachers' individual course plans. Overall, the participating teachers felt that the quality of the new science media lessons were comparable in difficulty but more engaging and meaningful to students than a typical lesson. This indicated the perceived added value of integrating science media to capture students' attention and make the content more relevant to them. Providing teachers with the opportunity to collaborate with one another was an important feature of the workshop. The use of more readily available and accessible equipment meant teachers were able to successfully complete the design and implementation of media-based science lessons with students within the allotted time of the workshop.

In summary, the teachers participating in the OSMP 2010 workshop reported that the lessons they developed and the skills they acquired would be directly applicable to their classrooms, and would help them make their curriculum more meaningful, interesting and engaging. They found working with other teachers and students rewarding, and they enjoyed learning more about media and using a new way to present difficult material. Participating teachers left the OSMP 2010 workshop feeling capable of creating and using media in their classrooms. These teachers, however, still saw lack of available equipment for students and lack of time in the curriculum as significant barriers to implementing science media assignments in their classrooms. In spite of these barriers, the returning OSMP teachers reported using their science media skills in substantive ways during the last school year. This suggests that even with limited tools and time, the 2010 OSMP participants are likely to implement science media teaching in their classrooms.

Conclusions

These summaries provide a picture of a project that has made an impact in the Omaha Public Schools classrooms. At an individual teacher and classroom level, science media creation is being integrated in student lab assignments, demonstration projects, reports and assessments. Teachers are creating media themselves to introduce ideas and spark classroom discussions, and their students are creating media to communicate their learning to their fellow students as well as their teachers. Participants reported renewed enthusiasm for teaching, and felt that science media offered unique benefits, by creating opportunities for making science more relevant and meaningful to students. Across the curriculum, use of media and journalism story-telling techniques are being shared among teachers within schools in other subject areas. At the district level, a community of science media educators has grown, with increased skills and experience, access to equipment and other resources, and collaboration among colleagues.

Omaha Public Schools has made a commitment to integrate the original media products created at the 2009 OSMP workshop within curricular units, and they are available to all OPS teachers through their online resource bank. Lesson plans developed at the 2010

OSMP workshop were shared among the participants, and nearly all the teachers anticipated using multiple lessons that they and their colleagues had created.

Notwithstanding these successes, many participating teachers struggled to find the time to implement these changes, both with respect to planning time and time within the curriculum. Teachers also reported limited access to needed equipment, and some did not feel adequately prepared to use the media hardware and software. This was particularly true after the 2009 Workshop, in which students were included as peer learners with the teachers. With respect to impacts on student outcomes, standardized test score comparisons on OPS science standards showed no definitive results for either the participating students or for the students of the participating teachers. This is not surprising nor particularly meaningful, given the test was not designed to measure learning gained from the workshop virology content. However, a primary goal of the project is to increase student learning and this assesses key science content for the district.

In making sense of the outcomes of the project, it's important to look at the design of the two workshops. The two different models for the workshops complemented each other, and the first made the second possible. The 2009 workshop involved very high-end technical equipment and expertise, as well as access to scientists and their labs, enabling the creation of professional media products about specific virology topics. Students' role was defined as "peer" to the teachers, and the workshop goals given to the teams focused on student understanding of science and media learning. Outcomes of the first workshop included professional media products as well as professional development of teachers. However, teachers felt that the focus on student learning hampered their own opportunities to gain technical expertise. In addition, the level of expertise needed, given the complexity of the equipment, was high. At the conclusion of the workshop, teachers were proud of their teams' media production, had enjoyed the intense experience interacting with media professionals and scientists that provided motivation and inspiration, and felt they had learned a lot. But some were unsure about implementing science media within their classroom teaching. Continued support and contact during the following school year by the project and among the teachers helped provide needed resources for these teachers. Most implemented some kind of science media learning with their students during the school year.

The 2010 workshop focused on topics identified by the teachers themselves, participants used consumer level equipment, and had no access to scientists or content experts. Students' role was similar to a regular classroom situation. The 2009 OSMP teachers were mentors to the newly participating teachers, and thus the second workshop built upon the professional development from the first workshop. Outcomes of the second workshop included teacher-developed lesson plans and professional development. Teachers defined the content areas and lesson topics needing revamping, ensuring that the lessons developed would be immediately applicable in their classrooms. Teachers left the workshop confident in their ability to integrate the new science media lessons in the coming year. The 2010 workshop also encouraged more collegial interaction among the teachers, creating the opportunity for a stronger community of support to sustain the teachers after the conclusion of the project.

Throughout the project, both science media product and science media process have been the focus. The first workshop accomplished the creation of professional products, and these are now science media resources available throughout the district. This would not have possible without the involvement and partnership of the media professionals and the "prosumer" equipment used to created professional media. The professional development of the teachers in the first workshop was leveraged in the second workshop, which focused primarily on science media process and implementing science media process in classrooms. While both product and process were important elements for the workshops and the professional development of teachers, it's the process of creating media that hooks students and is a dynamic, new way for students to learn science.

Whether or not test gains on district assessments may eventually be an outcome of this project, the teachers involved in this project feel they are now more able to help their students see the relevance of science to their lives, and to apply and demonstrate their learning in new ways. It is another tool for teachers to connect with students, and for students to connect to science. Feedback from the teachers indicate that the project provided them with additional motivation and enthusiasm for teaching, and gave them new skills with respect to incorporating media and storytelling techniques to make science more meaningful to their students. As teachers individualize their use of media in the classroom, diverse practices continue to emerge and develop. This project initiated and supported important change for many teachers in the district, and impacted the district itself. The Omaha Science Media Project helped ensure that science media learning will be part of OPS science classrooms for years to come.

Appendices: Full Evaluation Reports

The following full evaluation reports are appended here:

- World of Viruses Front End Evaluation Report
- Teacher Pre-Workshop Media Survey Report
- 2009 Workshop Evaluation Summary
- 2009 Workshop Follow-up: Participating Teachers' Plans and Activities Using New Science Media Skills
- Omaha Science Media Project Evaluation (from OPS Division of Research)
- 2010 Workshop Evaluation: Teacher Survey Results

World of VIRUSES

Front End Evaluation Report

Amy N. Spiegel, Ph.D.

April 2009

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World of Viruses Front End Evaluation
Executive Summary

Amy N. Spiegel, Ph.D.
April 2009

The World of Viruses Front End Evaluation was undertaken to provide planning and baseline data about youths' understanding of viruses. The information was gathered to help project staff with the design of the World of Viruses educational materials on virology topics. A survey of mostly open-ended items was designed around the "Essential Questions" identified as central to a basic understanding of viruses. This brief, one-page survey was administered in science classes to a total of 126 middle and high school students, ranging in age from 13 to 16 years, from public schools in Lincoln, Nebraska.

The majority of students responding to this survey had a basic grasp of viruses as disease agents, and most were also able to provide other specific information. Almost all students knew that viruses are found in animals and in the air, and over half agreed that viruses are found in plants, the ocean, and soil. One-third described viruses as attacking cells, and one-fifth mentioned the role of the immune system or white blood cells in fighting viruses. A much smaller number identified the need of a virus for a host, named specific viruses, and/or noted that viruses have their own genetic material.

Over three-quarters of the students correctly identified an image of a bacteriophage as a virus, and most indicated they had seen pictures of bacteriophages at school. Half of the students correctly identified an image of HIV as a virus. However, half of the students incorrectly identified images of a cell and/or bacterium as viruses.

When asked how viruses could be helpful, 28% of students did not know and 10% did not believe that viruses could have a positive role. Of the remaining students, the most frequent response was that "good" viruses could somehow counteract or protect us from "bad" viruses. Students also thought viruses could be helpful for use in vaccines or to strengthen the immune system, or could be used in research to develop cures or other kinds of medicine.

When asked to explain how modern-day vaccinations help prevent disease, students' responses revealed a range of understanding. About 30% of the students did not respond or gave no meaningful response to this question. Another 30% indicated that a vaccine contains medicine, or works by killing, fighting off, or blocking the virus. However, nearly 40% of students did include more relevant information about how vaccines work. These responses reflected one or more of the following: that a vaccine includes a *"weakened version"* or *"part of"* the virus; that a vaccine strengthens the immune system; and that the body learns to recognize a particular virus and responds by fighting it off. Some students mentioned antibodies. With respect to misconceptions about vaccines, some students said that vaccines themselves create or contain antibodies, and one student stated that s/he did not believe vaccines help prevent disease.

The last item on the survey asked students what they would ask a virus expert if they had the opportunity. Nearly two-thirds of the students had questions, and most of these fell into four major areas. The most frequent were questions about the origin, survival, or fundamental functions of viruses, such as *"where do they come from?"* Other questions pertained to personal health and protection, including how to avoid viruses and how to tell if you have one. Another area of interest focused on virus identification and categorization, including information about their appearance, how many types exist, and what the worst virus in existence is. Finally, students also asked about virus behavior and pathogenicity, with questions like *"what do viruses exactly do to a human's body?"*

Overall, students' responses indicated an interest in and a familiarity with viruses. The vast majority were able to offer some relevant information about viruses, and a smaller subset displayed a basic understanding of what a virus is, how viruses cause disease, and how vaccines help to control them. There were, however, significant gaps in knowledge for many of these students, and some misconceptions. These results illuminate both strengths and weaknesses in student understanding and should provide useful data to help in the design of educational materials for this population.

Introduction

World of Viruses (WoV) is an educational project funded by the National Center for Research Resources at the National Institutes of Health through the Science Education Partnership Award (SEPA) Grant No. R25 RR024267-01 (2007- 2012). WoV was funded to develop documentaries and features for public and satellite radio stations. These products are complemented with a sophisticated outreach package for public libraries, educators, and middle and high school students. The planned educational package now includes essays, graphic novels, and cartoon panels, in addition to the radio documentaries—all focusing on a variety of virology topics.

The World of Viruses Front End Evaluation was designed to provide planning and baseline data about youths' understanding of viruses. The purpose of this front end evaluation study was to gather initial data on what youth in the targeted age range already know about viruses. This will help with the planning and design of the World of Viruses educational materials on virology topics by establishing some baseline data about the information needs of the targeted audience.

To discover what middle and high school students currently know and understand about viruses, a front end evaluation survey was undertaken. Instead of offering only multiple-choice or true/false options, this survey was designed as an open-ended instrument to solicit youths' responses in their own words. A survey constructed of these types of questions requires articulation of concepts rather than simple recognition; responses will yield a richer understanding of students' thinking and misconceptions.

The planned educational materials for WoV are being designed around several different viruses, tentatively including human papillomavirus (HPV), West Nile Virus, Ebola, and HIV, among others, and other virology topics, such as the role of viruses as natural regulators, tracking viruses, and developing new vaccines. Given the diversity of viruses, three fundamental questions about viruses were identified as a means to guide the material development. These "Essential Questions," identified as central to a basic understanding of viruses are: 1) what is virus? 2) what is the mechanism through which viruses infect, reproduce and cause illness? and 3) how can viruses be controlled or regulated? The educational materials will be designed to help students answer these questions about the different viruses. Using these Essential Questions as a guide, the following evaluation questions were identified:

1. What is the current understanding among the target group in regard to the following:
    a. the nature of viruses?
    b. virus replication, infection, and disease?
    c. human regulation of viruses?
2. What is the target group interested in learning about viruses?

Methods

A brief, one-page survey was developed (see appendix) to address the evaluation questions. The survey was developed, reviewed, and extensively revised in consultation with WoV project staff, including educators, virologists, and educational material developers. Some additional questions—involving other basic knowledge about viruses and identifying what youth want to learn about viruses—were deemed useful by project staff and added to the survey. The survey was trial tested with a group of students, and revisions were incorporated prior to final administration.

A total of 126 students from Lincoln Public Schools in Lincoln, Nebraska took part in the survey. Two schools, a high school and a middle school, were selected based on the diversity of their students, with over 30% minority enrollment and about 50% of the student population participating in the free and reduced lunch program. Six classes of students, three from 8th grade (middle school) and three from 10th grade (high school), took the survey. All classes were required science-related courses and thus included a representative cross-section of the student population in these schools. Students were asked to complete the questionnaire in their classrooms at the beginning or end of the class period.

The mean age of the student sample was 14 years old, with ninety-nine percent of the students ranging in age from 13 to 16 years old. Fifty-two percent of the participants were male, and 46% female (two did not indicate gender). With respect to race and ethnicity, the percentages in the individual racial categories below include those students who selected a single category. Those who selected multiple categories are counted in the multiracial group.

Ethnicity	Hispanic	11%
	Non-Hispanic	78%
	Did not indicate	11%
Race	White (only)	68%
	American Indian or Alaska Native (only)	4%
	Asian (only)	3%
	Native Hawaiian or Other Pacific Islander (only)	1%
	Black or African American (only)	9%
	Multiracial (selected more than one racial category)	10%
	Did not select a racial category	6%

Prior to administration, the instrument, assent forms, and all procedures were approved by the University of Nebraska Institutional Review Board and by the Lincoln Public Schools Evaluation Director. For the analysis of the qualitative data, a simple categorical coding system was developed and all questions were coded by two raters. Ninety-six percent agreement or higher was reached on the first coding for each question, and discrepancies were subsequently discussed and resolved.

Results

What is the current understanding among the target group about the nature of viruses? The large majority of students (95%) attempted responses for most of the items. This suggests a general interest in the topic and furnishes a relatively complete set of responses. When asked to describe a virus, 86% of students provided some written response. Over two-thirds (71%) indicated that a virus makes you sick, is a disease or infection, or is harmful to the body. Nearly all of the remaining students who responded to this question included some other relevant information about viruses, and this is described in more detail below. Altogether, 97% of students came up with some relevant or accurate information about viruses, even if it was only that they are found in people or that they multiply.

What is the current understanding among the target group about virus replication, infection, and disease? Combining responses to the question items "Describe a virus" and "How do viruses make you sick?", 36% of students indicated that viruses "get inside" your body, with responses such as:

> *It lives in living things…*
>
> *Infect you.*
>
> *…a disease that can enter your body and make you ill.*
>
> *It gets into your system and can make you really sick.*

One-third of the students were specific in saying that viruses "attack," "penetrate," or "infect" cells, with responses such as:

> *They take over your cells in order to reproduce.*
>
> *They get in your body, multiply, then attack good cells.*
>
> *They attack your body and your cells to weaken your body systems.*
>
> *They attack your cells.*

Some of the respondents (17%) specified that viruses attack blood cells in particular, or that they enter the bloodstream as their means of infection; one-fifth (21%) of students described viruses as attacking the white blood cells or weakening the immune system.

Almost one-quarter (23%) included statements about viruses multiplying or reproducing *("it gets into your body and blood stream, multiplies and causes harm to your health.).*" Fifteen percent indicated that viruses were contagious or infectious *("it is something that you catch and get sick,"*and "*some come from the air and … you breathe it in and that is how you get sick.).*"

Several responses gave evidence of a more thorough understanding of viruses, with 8% indicating that viruses need a host or host cell and 4% mentioning that viruses have their own genetic material. One of the more complete responses was:

> *Viruses don't have a cellular structure, but they can and do reproduce, usually by invading a host cell and using its own genetic material to make copies of itself.*

Six percent named a particular virus, with half of these mentioning flu and the others naming HPV, cold, and West Nile. Only a small number (6%) specifically referred to the tiny size of viruses, although this was implied in the responses indicating that viruses enter cells. Eight percent described viruses as nonliving, and a couple of students addressed this by saying a *"quasi life form"* or *"neither living nor nonliving."* A few students included other accurate information about viruses, such as:

> *…can be found almost anywhere…*

> *…some are incurable.*

A small number of students claimed that viruses are bacteria (4%) or cells (2%). A few students also stated that viruses *"can't be cured," "our body can't fight them off,"* or *"there is no medicine to cure them."* Similar to these were the few responses that indicated that *"you have to let it pass through the system"* or *"let it run its course."*

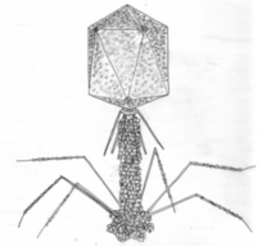
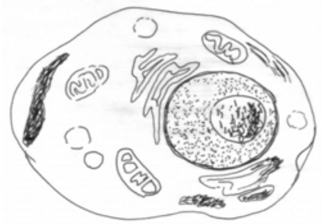
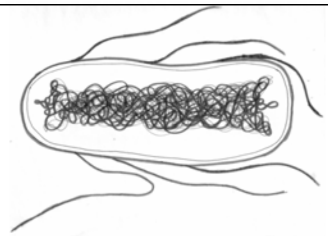
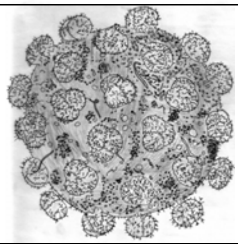
Overall, a large proportion of the responses were limited in scope, suggesting an incomplete understanding of the primary concepts about viruses.

Other information about viruses: Where are they found and what do they look like? When asked where viruses are found, 34% of students endorsed all of the places listed in the question (they were instructed to "check all that apply"). The following percentages of students endorsed each place:

96%	in animals
72%	in plants
57%	in soil
86%	in the air
58%	in the ocean
37%	other (please describe)

Of the students who indicated that viruses are found in other places, 7 students (6%) correctly maintained that viruses are ubiquitous, writing *"everywhere"* or *"anywhere."* Placing humans in a category separate from animals, 26 students (21%) wrote that viruses are found in *"humans," "us,"* or *"people."* Other places listed included *"dirty places," "public surfaces," "furniture," "water," "food,"* and *"tables."* A couple of students also listed *"computers"* as places viruses can be found. While this shows that students recognize that viruses are found in many places, it also shows that nearly two-thirds of the students surveyed don't grasp that viruses are constantly present everywhere around us.

The survey contained a series of four hand-drawn images, and students were asked to select which of them were viruses. These images are shown below, along with their correct identity and the percentage of students who endorsed each image as a virus.

	Bacteriophage Virus 79% correctly selected this as a virus. (21% did not select this as a virus.)
	Human Mammalian Cell 74% correctly did not select this as a virus. (26% selected this as a virus.)
	Bacterium 60% correctly did not select this as a virus. (40% selected this as a virus.)
	Human Immunodeficiency Virus (HIV) 53% correctly selected this as a virus. (47% did not select this as a virus.)

Twenty percent of the students not only correctly labeled the two viruses pictured, they selected just those two images as viruses. Another 19% endorsed the two viruses as well as one or both of the other images. Twenty students (16%) selected only the bacteriophage, while 10% selected only the HIV image as a virus. Half of the students incorrectly identified the cell and/or the bacterium as viruses.

When asked why they selected the images that they did, about one-third of the students indicated that they had "*learned it in science*" or had "*seen a picture of a virus in a science book*." Virtually all the students who referenced learning about viruses in school endorsed the bacteriophage as a virus, so this image was familiar to many of them, but not all. However, most of the students who recognized the bacteriophage either failed to identify the HIV image as a virus or identified the other images as viruses, or both. Other explanations given by students for their selections included seeing them on "*a cartoon show [Jimmy Neutron]*" or "*in pictures*." However, many students seemed to be guessing or were uncertain, giving explanations such as:

> *Because they look like something that could be a virus.* (chose cell, bacteriophage, and bacterium)
>
> *They look infected.* (chose HIV and bacteriophage)

Because they look like little things moving and floating around that's kinda what viruses are. (chose HIV and bacterium)

While a few students recognized the cell and did not choose that image ("*the second picture is a cell*"), others were clearly conflating the different microscopic images ("*they look like they'd be bad cells*" and "*because they look like unhealthy bacteria*").

Some students did try to apply what they knew about viruses in selecting the images and offered the following explanations:

I chose them because of the 'legs' or rather tentacles. (chose bacteriophage and bacterium)

Because it has all this different stuff inside. (chose HIV and bacterium)

I chose these ones because they are the virus that I think can enter the body. (chose HIV, bacteriophage, and bacterium)

It has tiny particles that look like it is attacking a cell. (chose HIV)

Because a virus can look like anything. (chose all images)

Other information about viruses: How can viruses be helpful? One important concept that some of the World of Viruses educational materials will highlight is that not all viruses are harmful, and that some play an essential role in ecological systems. To gain insight into students' current understanding of this concept, we asked, "How, if at all, can viruses be helpful?" Over one-quarter (28%) did not answer or indicated that they did not know. Another 10% said that they did not think that viruses could be helpful. However, the remaining responses fell into three general categories. The most frequently cited idea (27%) was that "good" viruses somehow counteract "bad" viruses, or that these "good" viruses fight disease or prevent illness. Some examples included:

They could counteract other viruses.

They fight other bad things that can harm us.

They can get rid of some sicknesses.

The second most frequently cited way that students thought viruses could be helpful was for use in vaccines or to "*strengthen the immune system*" (18% of responses), with comments that included "*they can sometimes be used in vaccines to prevent illnesses*." Finally, 13% of students thought that viruses may be used in research or medicine to develop cures for diseases ("*they might be used to cure something maybe*." None of the responses made reference to anything about the possible regulatory role of viruses in ecological systems.

What is the current understanding among the target group with regard to human regulation of viruses? To address this third major evaluation question in a manner that students could understand and respond to, we asked them to explain how modern-day vaccinations help prevent disease. One-quarter of the students did not respond to this question. Another 6% mimicked the question in their response by stating that these shots prevent disease, with little additional information. Eleven percent responded simply by indicating that a vaccine contains medicine or something to help you, but provided no real mechanism or process for disease prevention. Thirteen percent said a vaccine works to *"fight off"* or *"kill the virus"* or disease, while 7% said that vaccines *"block the virus"* or protect against disease. Thus, about 60% of students showed no understanding of how a vaccine helps prevent a virus from causing disease.

Almost 40% of students, however, did include some more relevant information about how vaccines work. Eighteen percent indicated that a vaccine includes a *"part of," "a little bit,"* or *"a weakened version"* of the virus. Over one-quarter (27%) mentioned that a vaccine somehow strengthens the immune system or helps the body build immunity to the virus. Thirteen percent said that the body learns to recognize a particular virus and responds by fighting it off, and 6% mentioned antibodies. Only 2%, however, put all those ideas together to articulate what this student did: *"They put a weaker version of the virus into your system, then let your defenses fight it and build an immunity to it."*

With respect to misconceptions about vaccines, a few students said that vaccines contain bacteria to fight against disease. Some of the students who mentioned antibodies said that vaccines *"create antibodies"* or actually *"contain antibodies."* A few students also described vaccines as being injected directly into the bloodstream. One student indicated that s/he did not believe vaccines help prevent disease.

What is the target group interested in learning about viruses? When asked what questions they would have for a virus expert, many students (64%) had questions about viruses that ranged across a variety of topics, and several students had multiple questions. Of the questions listed, over one-quarter (27%) were about the origin, survival, or fundamental functions of viruses. These were questions like:

What causes them?

Where do they come from? How do they spread?

How do viruses evolve into different types of virus?

How or where [does a] virus start?

One-fifth (22%) of the questions pertained to personal health and protection. These included:

How to avoid them.

Is it curable?

Will I get one? How can you tell?

How are they prevented?

Another group of questions (21%) focused on identification and categorization of viruses, including information about their appearance, how many types exist, and *"what is the worst virus?"* The last identified category of questions (19%) pertained to virus behavior and pathogenicity—how viruses make you sick—with questions such as:

What do viruses exactly do to a human's body?

How do they make you sick?

Does the same virus affect different people the same way?

How people get viruses.

Summary and Conclusions

Nearly all the students were able to generate at least one accurate piece of information about viruses. The majority of students responding to this survey had a basic grasp of viruses as disease agents, and most were also able to provide other specific information. Almost all students knew that viruses are found in animals and in the air, and over half agreed that viruses are found in plants, the ocean, and soil. One-third described viruses as attacking cells, and one-fifth mentioned the role of the immune system or white blood cells in fighting viruses. A much smaller number identified the need of a virus for a host, named specific viruses, and/or noted that viruses have their own genetic material.

Over three-quarters of the students correctly identified an image of a bacteriophage as a virus, and most indicated they had learned about bacteriophages at school. Half of the students correctly identified an image of HIV as a virus. However, half of the students incorrectly identified images of a cell and/or bacterium as viruses.

When asked how viruses could be helpful, 28% of students did not know and 10% did not believe that viruses could have a positive role. Of the remaining students, the most frequent response was about "good" viruses somehow counteracting or protecting us from "bad" viruses. The second most frequently cited way that viruses could be helpful was for use in vaccines or to strengthen the immune system. Finally, a smaller group of students thought that viruses could prove helpful in research for developing cures or other kinds of medicine.

When asked to explain how modern-day vaccinations help prevent disease, students' responses revealed a range of understanding. About 30% of the students did not respond or gave no meaningful response to this question. Another 30% indicated that a vaccine contains medicine, or works by killing, fighting off, or blocking the virus. However, nearly 40% of students did include more relevant information about how vaccines work. These responses reflected one or more of the following: that a vaccine includes a *"weakened version"* or *"part of"* the virus; that a vaccine strengthens the immune system; and that the body learns to recognize a particular virus and responds by fighting it off. Some students also mentioned antibodies. With respect to misconceptions about vaccines, some students said that vaccines themselves create or contain antibodies, and one student stated that s/he did not believe vaccines help prevent disease.

The last question on the survey asked students what they would ask a virus expert if they had the opportunity. Nearly two-thirds of the students had questions, and most of these fell into four major areas. Over one-quarter of the questions were about the origin, survival, or fundamental functions of viruses, such as *"where do they come from?"*, *"how do they spread?"*, or *"what causes them?"* Twenty-two percent of the questions pertained to personal health and protection, including how to avoid viruses and how to tell if you have one. The third area of interest focused on virus identification and categorization, including information about their appearance, how many types exist, and what the worst virus in existence is. Finally, students also asked about virus behavior and pathogenicity, with questions like *"what do viruses exactly do to a human's body?"*

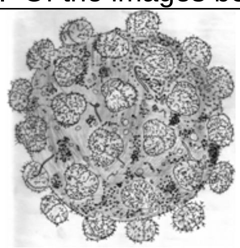
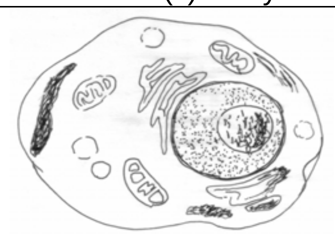
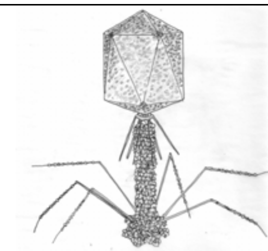
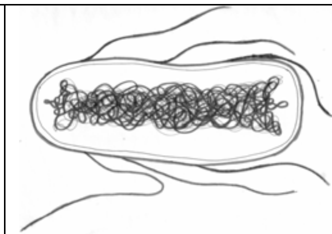
Overall, students' responses indicated an interest in and a familiarity with viruses. The vast majority were able to offer some relevant information about viruses, and a smaller subset displayed a basic understanding of what a virus is, how viruses cause disease, and how vaccines help to control them. A large proportion of these students, however, revealed significant gaps in knowledge of the primary concepts about viruses. Some misconceptions were also evident. The results of this survey illuminate both strengths and weaknesses in student understanding and should provide useful data to help in the design of educational materials for this population.

World of Viruses Survey

1. Where can viruses be found? (check all that apply)
   ___ in animals ___ in plants ___ in the soil
   ___ in the air ___ in the ocean ___ other (please describe):____________________
2. Describe a virus (what is it and what does it do?).

3. How, if at all, can viruses be helpful?

4. Of the images below, circle the one(s) that you think are viruses.

5. Please explain why you chose the image(s) you circled.

6. How do viruses make you sick? Please explain your answer.

7. Describe, as best you can, how modern-day vaccinations help prevent disease.

8. What question(s) would you ask a virus expert to learn more about viruses?

<table>
<tr><td colspan="2">9. What is your age? _______ years</td><td colspan="6">10. What is your sex? Female Male</td></tr>
<tr><td colspan="2">11. Select the ethnic category with which you most closely identify:</td><td colspan="6">12. Select one or more racial category with which you most closely identify:</td></tr>
<tr><td rowspan="2">Hispanic or Latino</td><td rowspan="2">Not Hispanic or Latino</td><td colspan="3">White</td><td colspan="3">Asian</td></tr>
<tr><td colspan="2">American Indian or Alaska Native</td><td colspan="3">Native Hawaiian or Other Pacific Islander</td><td colspan="3">Black or African American</td></tr>
</table>

Omaha SCIENCE MEDIA PROJECT

Teacher Pre-Workshop Media Survey

Brief summary of data presented to OSMP management team in May 2009

Amy N. Spiegel, Ph.D.
December 2010

CENTER FOR INSTRUCTIONAL INNOVATION

University of Nebraska Lincoln

OSMP Teacher Pre-Workshop Media Survey Data

This brief report summarizes a PowerPoint presentation given in May 2009 to provide planning data for the 2009 Summer Workshop. The data were taken from responses to a Pre-Workshop Teacher Survey developed and conducted by Dan Gilbert, OSMP Co-Director, and Amy Spiegel, OSMP Evaluation Coordinator.

This pre-workshop study was undertaken to gain a better understanding of the experience levels and confidence of the teachers selected to participate in the Omaha Science Media Project with respect to using, creating and leading students with media projects. These data also helped to identify specific technologies where additional training might be needed. The information below was presented to the entire management team to provide initial descriptive information about the teachers and their experiences with media. Detailed tables and all qualitative data with specific information about particular equipment and software the teachers had used were provided directly to the media professionals on the project to use and refer to as needed.

Tables 1 and 2 provide descriptive information, grade level and subjects taught, about the teachers selected to participate in the project.

Table 1. Grade levels taught by Omaha Science Media Teachers (n=18)

What grade do you teach? (mark all that apply)		
6th	5.6%	1
7th	27.8%	5
8th	38.9%	7
9th	38.9%	7
10th	33.3%	6
11th	33.3%	6
12th	33.3%	6

Table 2. Subjects taught by Omaha Science Media Teachers (n=18)

What subjects do you teach? Mark all that apply		
Answer Options	**Response Frequency**	**Response Count**
science	72.2%	13
journalism	16.7%	3
technology	11.1%	2
Other (AP English Lit, Biotechnology, Tech & Living, Instrumental music)	22.2%	4

Some selected items were summarized on teachers' self-report with respect to frequency of use of media in the classroom and teachers' attitudes toward media (see Table 3).

Table 3. OSMP teacher self-report of media practices and attitudes in class (n=18)

Question	**Response**
How frequently do you use any kind of electronic media (web, video, audio, other) in your classes?	17/ report more than once/week including 8 daily
How frequently do students use any kind of electronic media (web, video, audio, other) in your classes?	9 report more than once/week including 4 daily
How frequently do you use ANGEL for any kind of work in your classes? (please mark one)	Never: 13 Once or twice/month: 5
If you are using media in your classes, how beneficial do you think using media is for your teaching?	17 "Very beneficial"
If you are using media in your classes, how beneficial do you think using media is for your students' learning?	17 "Very beneficial"

More detailed information on teachers' feedback about their experience with media use, current practices in the classroom, and attitudes about media use is shown in Table 4.

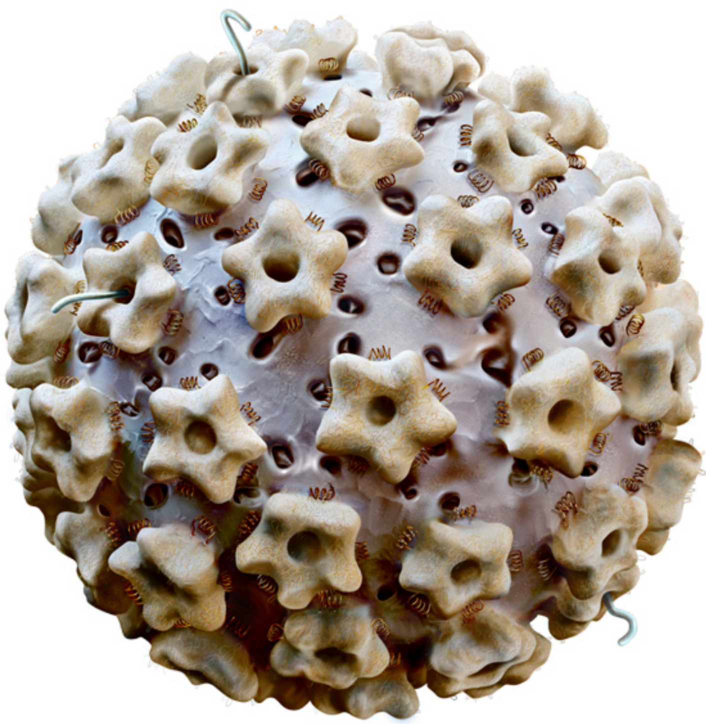
Table 4. Teacher Self-Report on Media Experience, Practices, and Attitudes prior to OSMP involvement (n=18*)

Experience			
What is your level of experience working with...	*None or Novice*	*Intermediate*	*Proficient or Expert*
Taking digital photographs?	11% (2)	22% (4)	67% (12)
Shooting video (home movies, student presentations, performances, etc.)?	22% (4)	29% (7)	29% (7)
Editing video (home movies, student presentations, performances, etc.)?	67% (12)	17% (3)	17% (3)
Creating audio products (audio essays, podcasts, etc.)?	72% (13)	11% (2)	17% (3)
Pulling resources off the web for producing media?	56% (10)	22% (4)	22% (4)
Conducting interviews in any setting?	39% (7)	28% (5)	33% (6)
Creating Webpages with any tool?	78% (14)	0	22% (4)
Practices			
How frequently do...	*Less than once a week*	*Once or twice a week*	*More than twice a week or daily*
You use any kind of electronic media (web, video, audio, other) in your classes?	6% (1)	39% (7)	56% (10)
Students use any kind of electronic media in your classes?	44% (8)	17% (3)	33% (6)
Attitudes			
What is your level of confidence in effectively doing the following things?	*Not at all confident or apprehensive*	*A little nervous*	*Mostly or very confident*
Creating video products (video clips, demonstrations, etc.) for use in your classes?	39% (7)	11% (2)	50% (9)
Creating audio products (audio essays, podcasts, etc.) for use in your classes?	39% (7)	28% (5)	28% (5)
Creating multimedia products (websites, mashups, etc.) for use in your classes?	39% (7)	22% (4)	39% (7)
Directing students in creating video products?	22% (4)	33% (6)	44% (8)
Directing students in creating audio products ?	33% (6)	39% (7)	28% (5)
Directing students in creating multimedia products?	39% (7)	28% (5)	33% (6)

*not all teachers responded to every item

Omaha SCIENCE MEDIA PROJECT

2009 Workshop Evaluation Summary



Amy N. Spiegel, Ph.D.
with assistance from Leah Carpenter

November 2010

CENTER FOR INSTRUCTIONAL INNOVATION

University of Nebraska Lincoln

Omaha Science Media 2009 Workshop Evaluation Summary

Amy N. Spiegel, Ph.D.
November 2010

Project Description

The Omaha Science Media Project (OSMP) involved sixteen Omaha Public School (OPS) teachers and fifteen Omaha Public School students in an intensive, collaborative two-week summer workshop about viruses and infectious disease in July 2009. Teaming up with media professionals and content specialists, these teachers and students worked as "science journalists" to create media productions (audio, video, and multimedia) focusing on different virology topics. Participants were grouped into eight teams, each of which included two teachers, two students (except for one team that had one student), a media mentor, and a content mentor. These teams were each assigned to a virology topic, and were provided access to a virologist or other virology expert working in the topic area. The OSMP workshop model included three key features that differed from a more standard inservice "teacher internship" science learning model. These unique features were:

1) Participant immersion in a virology research topic during a two-week period, including access to research staff, labs and to a full-time facilitator, some of whom were content specialists,
2) Inclusion of students as partners in the learning and production teams, and
3) Development of media products as an outcome, with continuous access to media mentors to facilitate this goal.

The goals of the project were 1) to produce high-quality, classroom-ready media products about virus topics that were relevant to students in middle and high school and 2) to improve the pedagogy of these teachers through this experiential professional development. While the media products were not expected to be in final form at the completion of the workshop, the overall storyline and content of each was expected to be well-defined, and the media professional assigned to each group had agreed to do the final finishing to the product after the end of the workshop. In addition to these media products, it was expected that through the process, the teachers would learn media and journalistic skills that they would be able to infuse into their classroom teaching, with the goal of increasing student learning and interest in science and health careers. Specific science learning and media learning outcomes guided the teams (see Table 1).

Table 1. Science learning outcomes and media learning outcomes provided to each team.

SCIENCE LEARNING OUTCOMES Youth develop an understanding of …	**MEDIA LEARNING OUTCOMES** Youth develop an understanding of….
1. What is a virus?	1. How do you plan and research to tell a science media story?
2. How do viruses reproduce inside a cell?	2 How do you record a science media story using a variety of devices?
3. How do viruses spread from one individual to another?	3. How do you gather material and edit that material into a science media story?
4. How do viruses evade host defenses?	4. How do you share a science media story with peers, teachers, and parents?

Participants: Eight OPS middle school teachers and eight OPS high school teachers applied and were accepted to participate in the two-week workshop. The teachers included three disciplines: science (twelve teachers), media/technology (two teachers) and journalism (two teachers). Fifteen students, all of whom had just completed 8th grade, were chosen to participate. These students had been selected from a larger pool of identified students who had been asked to apply. The pool of students were identified based on a number of characteristics, including achievement and aptitude scores, demographic characteristics, and teacher recommendations with the goal of identifying students with an aptitude for science who may be underachieving.

At the conclusion of the workshop, we asked for written feedback from both the teacher and student participants about their workshop experiences. This report summarizes this feedback.

Purpose of Evaluation

The purpose of this evaluation is to describe the feedback provided by the participants in the program with the goal of helping project staff better understand participants' experiences and provide relevant information for planning future teacher workshops incorporating media production within a discipline. It provides an opportunity to reflect on the workshop process and consider some of the strengths and challenges of the workshop.

Data Collection

On the last day of the two-week workshop, both teachers and students were asked to complete a written survey about their workshop experiences, and then the evaluator led group discussions with each group about their feedback. The survey instruments were developed in consultation with OSMP partners including the OPS Science Supervisor, the OSMP Coordinator, and other OSMP staff. Results presented here represent feedback from both teachers and students.

Results

Results will be described in the following main areas:
1) The impact and utility of the workshop for the participating teachers,
2) Strengths and challenges,
3) The role of students in the learning team, and
4) Teachers' recommendations for change.

The impact and utility of the workshop for the participating teachers

The participating teachers were expected to master new skills with respect to journalistic story-telling techniques as well as new technology including recording, logging, and editing their media product. The goal was for them to be able to take these new skills back into their classrooms to their students.

When asked "What do you think will be the most valuable future outcome of your participation in this project?" and "How will OSMP experiences change your teaching?" responses were mostly positive and diverse, reflecting the range of teachers' skills and perspectives, as well as the breadth of the workshop objectives. Anticipated changes fell into three main categories: pedagogical changes, curricular changes and changes outside the classroom. Two or more of the participating teachers articulated each of the following anticipated outcomes.

Pedagogical changes

- **Teachers will bring their workshop experience back into their classroom,** and specifically, increase use of media to teach science. Comments included, "[I plan] to take current media making techniques and place it in the hands of students [and] to facilitate them with their own projects."
- **Teachers' new skills will increase involvement for all students.** As one teacher wrote, "[media projects] will be a great hook for not only borderline students, but also the gifted." Another commented, "I will use media production in my classroom to help teach science. I think it is a wonderful way to get students involved because media is such apart of our lives today."
- **Teachers recognize more than ever the importance of making science relevant to their students.** One teacher explained, "I [see] the impact of relevance. If we would have started this process with lessons on viruses, the students would have checked out. They became more open to learning as it became more important for them to understand." Another teacher commented, "Students need to see the big picture when it comes to learning science. They don't relate it to their lives day to day! But relating the knowledge to an outcome such as the research done at UNMC and what the researchers are doing their labs and how they are discovering cures for diseases hits home!"

Curricular changes

- **The teachers envision making curriculum improvements and integrating media across different subject areas.** Comments included, "After this experience, I have a renewed enthusiasm for working with teachers in other content areas," and "I will be able to use this for our freshman biology courses. I will also take the ideas and use them in Social Studies and other subject areas."
- **The teachers are better able to integrate the story-telling process into their lessons.** One teacher commented, "I think I will always be looking for a 'story' to tell and an engaging, exciting way to share it with others."

Changes beyond the classroom

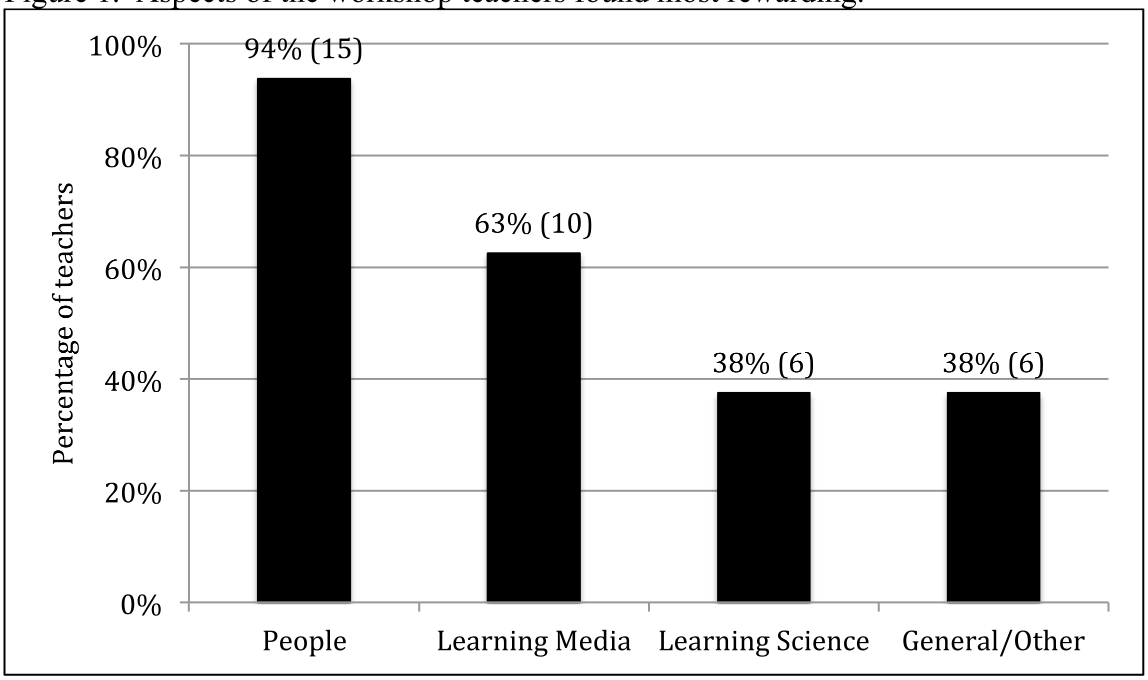
- **The teachers hope to continue connections with scientists and media partners.**
- **The teachers improved their skills in working with a diverse group of partners.** One teacher wrote, "I learned a lot about the value of collaboration!"

Overall, 94% of the teachers agreed that their participation in the workshop would be somewhat or very valuable in their future teaching.

Strengths and Challenges

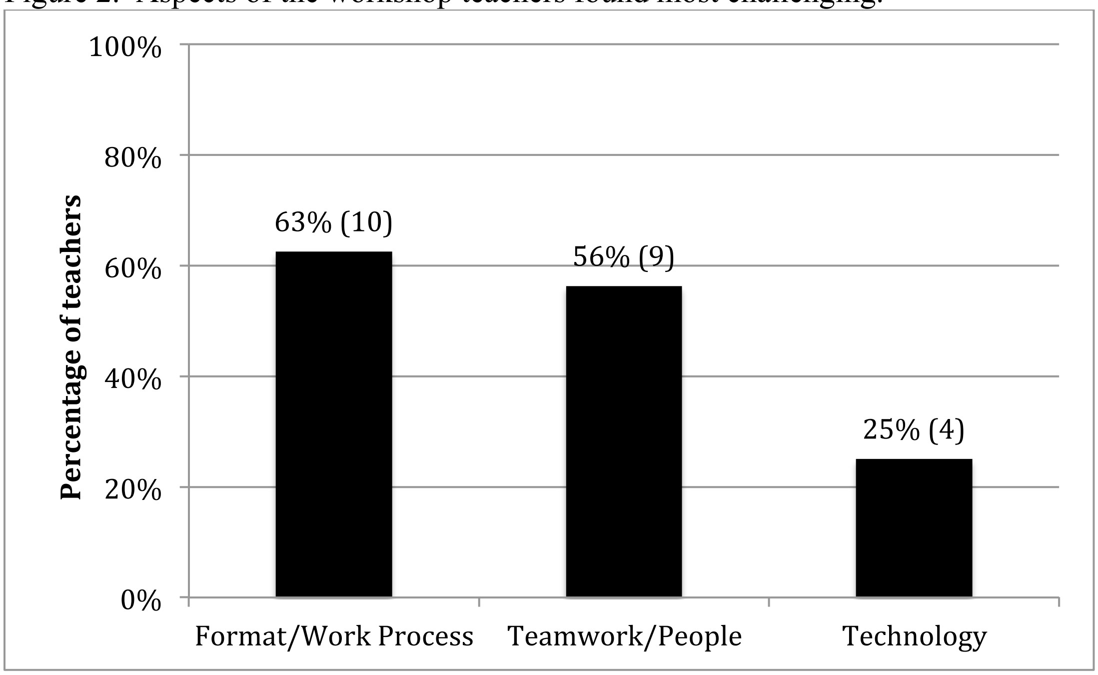
When asked to articulate the most rewarding and most challenging aspects of the workshop, teachers responded with more positive than negative comments. Overall, almost every teacher found interacting and working with the other people at the workshop was the most rewarding aspect of their experience (see Figure 1). Teachers wrote that they enjoyed, "working with kids," "working with the medical professionals and media professionals," and "being able to work with some truly amazing people in a collaborative effort." Many teachers also found learning new technology skills rewarding. As one teacher wrote, "Learning all that goes into media production was amazing." Over a third of teachers also commented on the science experience, indicating they enjoyed, "learning more about viruses," "being allowed into the science lab," and "working with the doctors and seeing their research." Other comments about the most rewarding aspects included, "developing a 'professional' project and seeing some growth in the two students I worked with," and more general comments, such as "new learning (new understanding)."

Figure 1. Aspects of the workshop teachers found most rewarding.



With respect to the most challenging aspects of the workshop, teachers cited the work process or the format of the workshop most frequently (see Figure 2). One teacher wrote, "The most difficult part was sitting through the lectures during the initial days of the workshop." Other challenges included "developing the idea for a story," and "[getting] a finished product done in the two weeks." The next most frequently identified challenge was in managing the team process successfully. One teacher felt they struggled to "find a balance of participation within our team," and another wrote wrote, "the most challenging part of the workshop was getting the grownups to work together." In addition, a quarter of the participating teachers mentioned challenges in learning the technology, both in terms of "keeping up with the students on technology skills," and "trying to learn the final cut Express program. One teacher expressed this in a somewhat different way, writing, "I didn't feel that I got as much 'hands on' learning as I was expecting.

Figure 2. Aspects of the workshop teachers found most challenging.



The role of students in the learning team.

Overall, the inclusion of students in the learning teams had a positive impact. Almost all the teachers agreed that the students contributed key ideas to the media products that made them better and more relevant than they would be have been otherwise. However, by having the students complete so much of the production work, the teachers were not provided with as much opportunity to develop their own technical skills.

When asked "how did the inclusion of students in your team impact the science media story process or product," the majority of teachers (88%) felt that the students made an important, even essential, contribution to the creative process. In particular, the teachers described how the students helped shape the stories to make them relevant and interesting to other students.

"The students' inclusion was incredible. They designed and carried out a plan that made our product come together. Without them, the project would have been flat."

"Students helped at all steps to develop our story for a student audience"

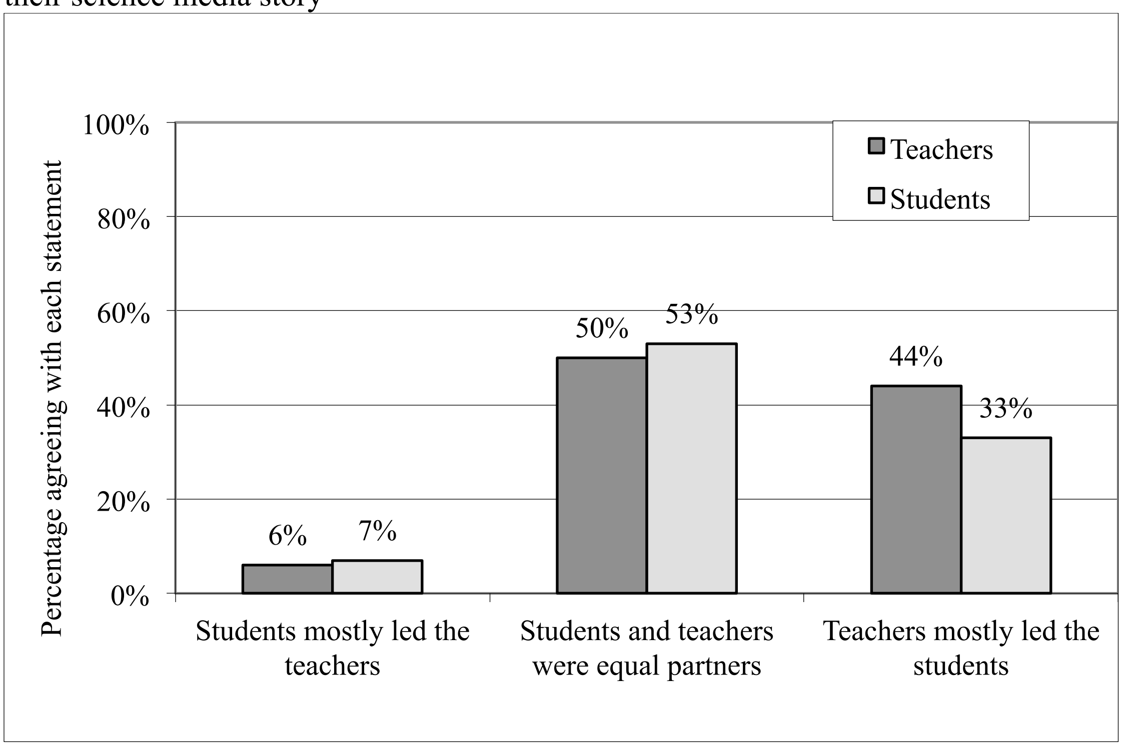
"The product includes vernacular that is common to 13-15 year old students. The story includes humor that students relate to.

"Students provide the answer to the question, "so what?" They know, and we are able to tell what is interesting and important to them."

While a few of the teachers acknowledged some difficulties in working with these students, either in terms of motivation or keeping them on task, most felt that they were able to work through these issues over the two-week time.

With respect to the student perspective, most felt that they were viewed as contributing, important members of their working team, with 94% agreeing that the adults in their group asked for their opinions, and 87% agreeing that their group used some of their ideas for the media story planning and production. In addition, half of the teachers and the students felt that the students had at least an equal leadership role as the teachers in their groups. See Figure 3 below.

Figure 3. Participants' perceptions of leadership roles within their team in making their science media story



For the students, the workshop provided them with useful, fun, and positive experiences that had an impact on the way they view science, technology and media, mostly creating more positive attitudes. The overwhelming majority (94%) of the students agreed or strongly agreed that what they learned at the workshop will help them in high school. When asked "How did being part of this workshop change you?" students' responses to more global questions were positive, with the large majority of students feeling better about themselves, and with no students feeling worse or feeling that the workshop had no effect on them. In addition, many students became more interested in science and technology because of their participation (see Table 2), although a few were less interested.

Table 2. Percent (number) of students endorsing different statements about how the workshop changed them (n=15)

Science Attitudes	
I want to learn more about science	67% (10)
I want to learn more about viruses	67% (10)
I want to take more science courses	60% (9)
I want to work in a science lab	33% (5)
I don't want to become a scientist	33% (5)
I want to avoid science courses	20% (3)
I don't want to work in a science lab	20% (3)
Media Attitudes	
I'm better at using technology	93% (14)
I want to work more with technology	80% (12)
I want to take more media courses	73% (11)
I don't like using technology as much	7% (1)

Overall, students found their experience at the workshop worthwhile and enjoyable. When asked to name five words to describe their experience, the most frequently generated words were, "fun" and "exciting."

Teachers' recommendations for change

When asked what changes they would recommend to the workshop, almost all the teachers had some specific ideas. The most frequently cited change was to enable the teachers to gain more skills with the equipment and software they were using to create the media products. Several ideas to accomplish this were suggested, including providing the teachers with access and education on the equipment prior to the workshop itself, with comments such as, "I think one thing I would do is have first a teacher workshop just to train the teachers on the whole process first," and "Train the teachers first. The students were told to take control of editing, etc. but if the students are doing the work, how can the teachers learn." Teachers also suggested providing more hands-on equipment time for the teachers during the workshop, and using less complex equipment.

Several teachers felt that the students could be accommodated better, with shorter days ("consider shortening the day for students only"), and/or more active time. Some suggestions on this included, "Collaborate more with teachers on students' activities to help get students more engaged, [so there is] less dead time," and "since we are working with younger students, have short activity times. Doing the work is our focus; I think time for "camp" would go a long way." A few teachers also thought that a modified selection process to identify more motivated students or selecting older students would have created a more productive work group, since "the maturity level of the students was difficult to work with and their interest sometimes waned." One suggestion called for training the students on the equipment first, so they "would have been able to teach us."

Finally, by creating eight separate groups that worked independently, each group needed to coalesce and work productively as a team with each member contributing. The dynamics of the group process were more difficult for some groups than others. Some teachers felt that they could have benefitted from clearer expectations and explicit direction on the process and products of the workshop, including defining more specific roles for individuals within the groups.

> *"[the leaders should be] a bit more clear on the 'road map,' a little more detail about the final outcome expectations."*

> *"The media people should conduct a media workshop to teach us the media. Then they should turn the teacher and student loose to go practice what they learned by making a video. They can be consultants if need be. Having too many 'directors' on a team is stressful."*

Recommendations

For future workshops of this nature, some lessons learned emerged from this evaluation. First, the general format and purpose of the workshop was a strength. The creation of small teams of teachers and students working together to create a media product, and providing them with support and guidance from media experts and a content mentor, with access to scientists, resulted in a productive, workable structure. Including the students as contributing members of the team was identified as a key component in making the media products relevant to a student audience. However, group dynamics emerged as a barrier to productivity and cohesiveness for some groups. The collaborative process for some teams might have been enhanced with some brief preparation about group process and providing concrete strategies for working together. Finally, teachers felt that they needed more hands-on time to learn to use the media tools. This could be accomplished by a pre-workshop introduction with a small assignment using the actual equipment, more time built into the workshop for teachers to use the tools, or a different division of labor with the students. In addition, using simpler media tools that required less expertise would have reduced the learning curve and allowed for faster mastery of the equipment and software. Overall, the three key features of this workshop, participant immersion, student inclusion, and the goal of media products, all appear to have been important contributing factors to the success of the workshop.

Conclusions

The workshop was very well received by both the teacher and student participants. The inclusion of students proved to be an important element in the process of creating the media and the resulting product. The teachers reported that they learned many valuable skills that they anticipated incorporating into their own classrooms. They expect to increase student involvement and motivation through the use of media, and they envision making curriculum improvements in their schools. Teachers also felt that they improved their skills in using a story-telling process and their skills in working with a diverse group. Most of the teachers felt strongly that the contributions of the students resulted in more relevant media products, and the students felt they were valued team members. The students experienced positive attitudinal changes as a result of their participation and reported an increase in self-confidence and in their interest toward science media and technology. In addition, teachers had a renewed appreciation for the student perspective, and said they could see the impact of making content relevant to their students.

The opportunity to interact with the scientists, media experts, and to collaborate in teams with the other participants were cited by both students and teachers as highlights of the workshop. The participants also felt that learning more about media and technology was one of the primary benefits of their participation.

With respect to challenges and suggested changes, teachers wanted to come away from the workshop with more skills in working with the media technology. They felt that this could have been accomplished through teacher-only training prior to the workshop, providing more hands-on time during the workshop, or using less complex tools. They also felt that the students could have been accommodated better, with shorter days, more active time, or other changes in the format of the workshop structure. In addition, some teachers felt that the group dynamics were challenging at times, since there was no designated “leader” of each group, but rather a collaborative team process that emerged. While this was the intent of the workshop, and most teachers agreed that this ultimately was a successful strategy, it added stress to the long hours, new learning, and high expectations of the workshop.

Overall, the Omaha Science Media Project 2009 summer workshop was a successful, enjoyable, and productive experience for the participants. The general format with the teams creating media products was a strength, and the inclusion of students was a central component of the success of the products. Participant immersion allowed for intense and productive group worktime, and the finishing of the products after the completion of the workshop allowed for a final, polished product to result.

Omaha SCIENCE MEDIA PROJECT

2009 Workshop Follow-up: Participating Teachers' Plans and Activities Using New Science Media Skills

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October 2009

CENTER FOR INSTRUCTIONAL INNOVATION

University of Nebraska Lincoln

Omaha Science Media 2009 Workshop Follow-up: Participating Teachers' Plans and Activities Using New Science Media Skills

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Project Description

The Omaha Science Media Project (OSMP) involved sixteen Omaha Public School (OPS) teachers in an intensive, collaborative two-week summer workshop about viruses and infectious disease in July 2009. Teaming up with media professionals and content specialists, teachers and students worked as “science journalists” to create media productions (audio, video, and multimedia) focusing on different virology topics. One key goal of the project was to improve the pedagogy of these teachers through this experiential professional development. It was expected that the teachers would infuse these new skills and knowledge into their classroom teaching, thus increasing student learning and interest in science and health careers. To understand how the OSM teacher participants are making use of what they learned, we asked the teachers to share their plans for the current school year. This brief report summarizes the teachers’ descriptions of their new science media activities and plans.

Data Collection

In late September 2009, ten weeks after the completion of the workshop and six weeks into the new school year, the Omaha Science Media Project conducted a professional development session as part of an OPS curriculum day. Fourteen of the 16 OSM participant teachers attended the OSM session, which included time to verbally share with one another their current plans for incorporating new “science media” into their classrooms. We also asked them to write down their activities and plans as they move forward in the school year.

Teacher Responses

Thirteen teachers provided written summaries of what they are currently doing or planning to do in their classrooms and schools using their new journalism, science, and media skills. Of these teachers, the following percentages indicated that they are working on or toward these new activities:

100%	incorporating student-generated media production in my curriculum
54%	working with other teachers to help them learn more about journalistic techniques and media production
85%	creating new media products to use with my students
85%	using my new skills to enhance the curriculum
23%	other changes in my school
15%	other changes outside my school

In their verbal and written descriptions, teachers provided some detail about their work, their plans, and some of the barriers they face. Below is a summary of their feedback with examples in their own words.

Teachers already implementing what they've learned
About a third of the teachers indicated they are already using their new skills in the classroom. These teachers described the new ways they are using their media and journalism skills:

> *"My first attempt was to interview students with my flip camera during a "Pill Bug Inquiring Lab" that student partners designed…I was really surprised to see how the students responded to just the taping with my flip camera."*

> *"I have implemented a science media project where six media students will work in pairs to produce science media during class."*

Teachers creating media
Several teachers are using or planning to use their new skills directly by creating science media to enhance their teaching.

> *"I use and make video clips to use to teach concepts in my class. The students love them, especially since they are the stars of the video."*

> *"My plan is to tape students "cell organelle" presentations and use the clips to teach cell structure to my ELL and regular students – rather than me lecture!"*

Students creating media
All of the teachers are implementing or planning to implement student-created media in their schools. Some teachers are implementing media production with a smaller subset of students rather than with entire classrooms of students. For example, they are using media production with the science club group, the science Olympiad team, an afterschool club, or a select group of students. Others will be incorporating student created media products in their regular curriculum classes. Across these different applications, student media projects are taking a variety of forms, some as learning tools for the students creating them, some as teaching tools for other students to use, and still others are being used as a means of assessing student learning or as a significant part of a portfolio of student work.

Teachers working with select or smaller groups of students

> *For the science Olympiad, "each student will have a choice of making their own 'myth buster-like' video of their science Olympiad project"… "I have a science club that will be using video to enter to win science contest"*

> *"We will be videotaping our science Olympiad day, then we may put it up on a blog or the school's website"*

> *"I am working with any students to produce a slide show [to present at an upcoming school event]"*

Teachers working with classes of students

> *"[For the human body unit], students will make a documentary about a disease that has affected their family"*

"[For] human body project/invention convention/natural disaster projects: [I will have] students videotape skits, news reports, infomercials on what they have learned about the topic or showing off their inventions."

"[I am using] video lab summaries. Students create these as opposed to written explanations. This is a required piece of their labwork."

Students creating media for other students

"[I plan to have] students videotaping classroom projects to use to teach other students concepts."

"[1] would like to create videos to use in the classroom, made by other students."

"Students will create media on communicable disease and share with their peers."

Student media productions used as assessment

"2nd semester final will be a media product (likely a video) that will meet content assessment criteria, but will allow a great deal of student creativity"

"I want students to generate some video reports to demonstrate their understanding of the concepts. Students are involved with hands-on projects including the growing of plants from seed stage to flower stage, and the care of classroom animals. I want to develop audio and/or video products in which the students can document the progress of these projects."

"[I plan to have students do] video book talks. Students [will] be creating short (1-2 minute) advertisements for their favorite books. This would be a form of assessment…[students will be creating] media on 'green' awareness. This is part of my new elective course that is centered around competition-based science. This is done either small group or individually depending on the task. These serve as both assignments and assessments for kids. Some will have their final product be a movie."

Changes beyond the classroom

Several teachers also have plans to work with other teachers in their schools, with their principals, and/or to continue to collaborate with OSM partners. One teacher has already scheduled one of her classes to visit the UNL campus and have a day learning about virology with some of the OSM partners. Some are also looking forward to sharing their students' work through a blog.

Collaborating within the school

"I would like to encourage my principal to add a 'science media class' to our schools curriculum. I visualize this class working like our summer workshop in which students produce short media projects."

"My art teacher just started a new after school club that will use animation and video. I am hoping to work with her to help me reach students and learn how to work the equipment."

"[I plan to do a] media piece with foods and human growth teacher…students will create a "restaurant review" of local restaurants; I will cover the nutrient components."

"[I am planning on] working with the after school program and having a group to videotape and interview the students and volunteers – having the students run the whole thing"

"[I plan to work] in collaboration with my school's broadcast and computers classes by assigning student to be "science reporters or "science editors" for our daily T. V. show."

Blogging

"I will set up a blog for students to use."

"Media products will be published on a class web blog for student to engage in thoughtful dialogue. Parent, teachers, and other community members also have access to our class web blog."

"[I] really would like to have a blog."

Barriers to implementation

Barriers to teachers using their new science media skills fell into three primary areas: lack of time, lack of equipment, and need for additional support or resources. The barrier mentioned most often, by one-third of the teachers, was lack of time. Teachers felt they needed more time, both to be able to plan as well as time in the curriculum to integrate these new activities. One teacher whose students are already creating media products also identified the need to protect students who post material online.

Lack of time

"We don't have time to really sit down and plan."

"I just need to find time in my schedule."

"My biggest struggle now is finding time to add all this to my currently packed curriculum program."

"Significant time is required for students to produce high quality products."

Lack of equipment

"I do not have enough computers capable of editing (I only have mine)."

"[There is a] lack of equipment to be able to truly engage all students in the production."

Need for additional support or resources

"I am concerned on how well I understand the use of the cameras, etc. Is it enough to teach it?...I need help teaching the students how to use the technology."

"I'm intimidated by the technology."

Teachers value the use of media to teach science

Nearly all the teachers articulated how much they valued their new skills and how it provides important motivation and additional interest for kids in learning science.

"I definitely see a benefit to this approach."

"I see the importance of incorporating as much technology as possible into learning science as it will motivate my students."

"With the experiences of the past summer through OSMP, I am finding a renewed sense of enthusiasm with everything I do."

Media teachers can provide support

The two OSM participating teachers who teach multimedia skills to students both expressed a willingness to step in and work with the other OSM teachers, and this may be an important role for them to play to continue the momentum of the project within OPS.

"My greatest way to give back may be in the form of helping others, either with working with the technology (hardware) or helping others develop their ideas"

Conclusions

Overall, the OSM participating teachers continue to express their enthusiasm for their new skills and a desire to incorporate what they've learned and bring technology into their science classrooms. These teachers identified specific activities to use their new media skills with their students. The opportunity to have time to converse and exchange details about what they are doing in their classrooms, how they are doing it, and what resources they are using was clearly valuable to them. This communication provided both some motivation and some practical information they could use.

While some of these teachers have been able to immediately incorporate more media creation in their work with students, others expressed the need for additional and ongoing support, including the need for additional guided, hands-on time with the technical tools. Creating more opportunities for these teachers to communicate and share with one another would enhance the ability of these teachers to implement and sustain the integration of these new science media skills in their schools.

Omaha Science Media Project Evaluation

Document produced by the OPS Division of Research

Omaha Science Media Project (OSMP) Evaluation
Document produced by the OPS Division of Research

Overview

Two types of analysis were conducted to assess the effectiveness of Omaha Science Media Project (OSMP) training sessions. The first analysis is referred to as the student-level analysis while the second is referred to as the teacher-level analysis. Each analysis is described in detail below.

Student-level analysis

The student-level analysis was conducted to examine whether students who received OSMP training during the summer of 2009 scored higher on their 2010 science Criterion Referenced Test (CRT) than students who did not receive training. Fifteen students participated in OSMP training; however, CRT data was only available for 14 of the 15 students. A control group was selected by obtaining a list of all students who fit the criteria necessary for admittance into the OSMP training program including principal recommendation and indicator scores. Fourteen students were then selected that matched the experimental group on ethnicity, meal code status, special education status, and English Language Learner (ELL) status. Finally, the researchers confirmed that only two students from each group were taught by teachers who received OSMP training during the 2009-10 school year.

Data from 28 students (18 female, 10 male) were analyzed for the student-level analysis. Of the 28 students, 50% were Caucasian, 28.6% African American, and 21.4% Hispanic. Approximately 57% of students received free or reduced lunch while 17.9% were English Language Learners. Only a small percentage of students were classified as special education (3.6%). See Table 1 below for a description of demographic characteristics by participation in the OSMP. As can be seen, the non-participant and participant groups are equivalent on demographic characteristics including gender, ethnicity, meal status, special education status, and ELL status.

Table 1. *Demographic Characteristics of Study Participants*

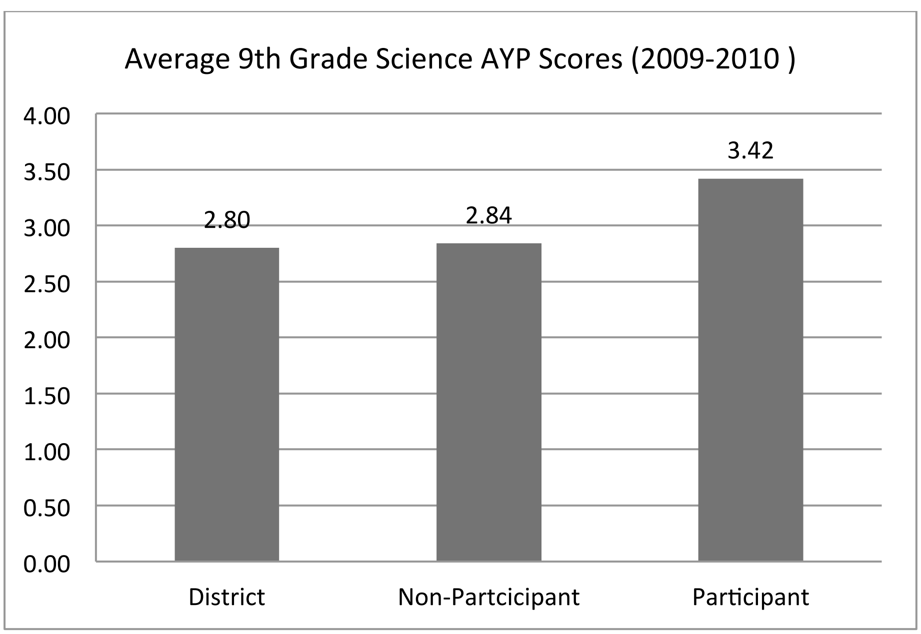
Demographic Characteristics	Non-Participant		OSMP Participant		Total	
Gender	N	%	N	%	N	%
Female	9	64.3	9	64.3	18	64.2
Male	5	35.7	5	35.7	10	35.7
Ethnicity						
Caucasian	7	50.0	7	50.0	14	50.0
African American	4	28.6	4	28.6	8	28.6
Hispanic	3	21.4	3	21.4	6	21.4
Meal Status						
Full-Price Lunch	6	42.9	6	42.9	12	42.9
Free/Reduced Lunch	8	57.1	8	57.1	16	57.1
Special Education Status						
No SPED	14	100.0	13	92.9	27	96.4
SPED	0	0.0	1	7.1	1	3.6
ELL Status						
No ELL	11	78.6	12	85.7	23	82.1
ELL	3	21.4	2	14.3	5	17.9

Ninth grade science CRT scores from 2009-2010 school year were obtained for each student. These were then compared with the district average for ninth grade students during the same school year. Results revealed that students who received OSMP training performed better than students who did not receive training on standards 2, 3, 4, 5, and 6. Participating students also had a higher overall AYP score and mastered more standards than students who did not participate (Figure 1). OSMP participants also scored higher than the district average on all standards, AYP average, and number of standards mastered. Total AYP score was the only difference that was statistically significant; however, the current sample only contained 28 students. A power analysis using an alpha of .05 indicates that 128 participants (64 per group) were needed to have an 80% chance of finding significant results. See Table 2 below for a summary of mean comparisons and significance tests.

Table 2. *Mean CRT Differences between OSMP Participants and Non-Participants*

Proficiencies	District Average	Non-Participant		OSMP Participant		Significance Test
		M	SD	M	SD	p
ST1	2.85	3.14	.36	3.00	1.18	.67
ST2	2.60	2.93	.83	3.36	1.08	.25
ST3	2.81	2.57	.94	3.14	1.17	.17
ST4	2.57	2.64	.93	3.07	1.14	.29
ST5	2.55	2.71	.99	2.86	1.46	.77
ST6	2.90	3.07	.62	3.21	1.19	.69
AYP Score	2.80	2.84	.59	3.42	.50	.01**
Standards Mastered	3.68	4.36	1.78	4.64	1.65	.66

Figure 1. *AYP Scores for the District, OSMP Participants, and non OSMP Participants*



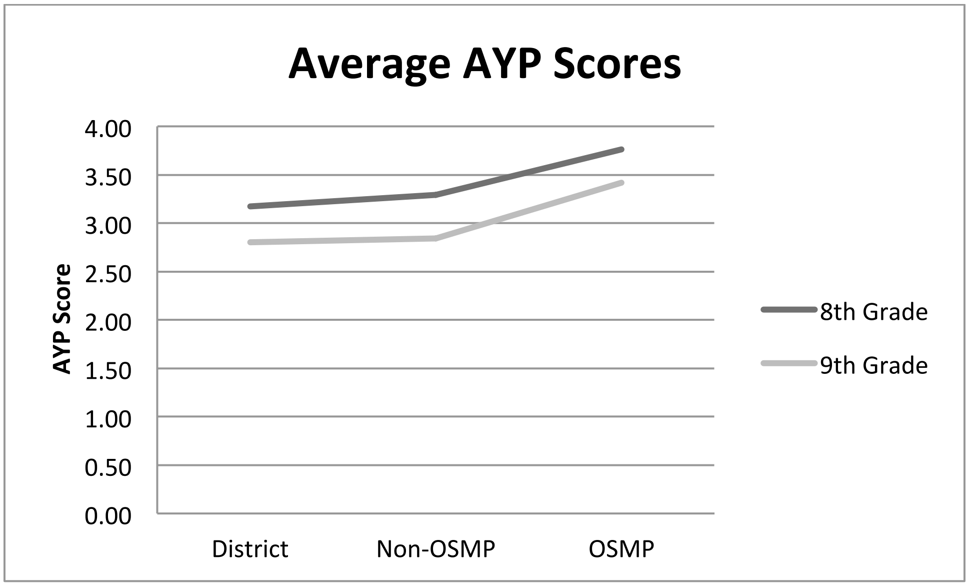
To examine whether these mean differences were due to OSMP training or prior science proficiency, we conducted a regression analysis controlling for students' 8th grade AYP score. This provided us with an understanding of the effect that OSMP training had on 9th grade AYP score above and beyond AYP score prior to training. Results suggest that while 8th grade AYP score accounted for a significant amount of variance in 9th grade AYP score, OSMP training did not. Therefore, we can deduce that mean differences between OSMP participants and non-participants after participation were likely due to prior science proficiency rather than OSMP training.

This point can be further illustrated by the mean CRT scores for students who did and did not receive training during 8th and 9th grade. As you can see in Table 3, students who received OSMP training scored higher on all six science standards as well as overall AYP score prior to receiving OSMP training. It is therefore probable that they would also perform higher on similar subject matter following training. This is also illustrated in Figure 2, which shows that AYP averages for all three groups (i.e. OSMP students, non-OSMP students, and all students in the district) scored higher during 8th grade than 9th grade.

Table 3. *Mean CRT Scores for OSMP Participants and Non-Participants by Grade Level*

Proficiencies	District Average (8th)	8th Grade CRT Scores		District Average (9th)	9th Grade CRT Scores	
		No OSMP	OSMP		No OSMP	OSMP
ST1	3.23	3.29	3.64	2.85	3.14	3.00
ST2	2.99	3.21	3.64	2.60	2.93	3.36
ST3	3.26	3.71	4.00	2.81	2.57	3.14
ST4	3.25	3.43	3.86	2.57	2.64	3.07
ST5	2.99	3.14	3.79	2.55	2.71	2.86
ST6	3.01	3.00	3.64	2.90	3.07	3.21
AYP Score	3.17	3.29	3.76	2.80	2.84	3.42
Standards Mastered	4.49	4.86	5.39	3.68	4.36	4.64

Figure 2. *Average AYP Scores for 8th Grade and 9th Grade*



Teacher-level analysis

The teacher-level analysis examined whether students taught by teachers who received OSMP training scored higher on science-based standards of the CRT than students taught by teachers who did not receive OSMP training.

Nine OPS teachers received OSMP training. To assess whether OSMP training of teachers influenced student CRT scores, we compared students who had the nine teachers prior to training against students who had the nine teachers after training. A total of 1,956 students were taught by the nine teachers (939 prior to training, 1,017 after training). See Tables 4 and 5 for a breakdown of students by school and grade level.

Table 4. *Frequency and Percentages of Students by School*

	2008-2009		2009-2010		Total	
School	N	%	N	%	N	%
Accelere	0	0.0	1	.1	1	.1
Alice Buffet Magnet	167	17.8	145	14.3	312	15.9
Beveridge	131	14.0	139	13.7	270	13.8
Blackburn	16	1.7	30	3.0	46	2.4
Central High	80	8.5	120	11.8	200	10.2
Douglas County Youth	0	0.0	7	.7	7	.4
Independent Studies	0	0.0	2	.2	2	.1
King Science & Technology	169	18.0	126	12.4	295	15.0
McMillian Magnet	130	13.8	111	10.9	241	12.3
Morton Magnet	246	26.2	331	32.5	577	29.5
Parrish	0	0.0	5	.5	5	.3
Total	939	100.0	1017	100.0	1956	100.0

Table 5. *Frequency and Percentages of Students by Grade Level*

	2008-2009		2009-2010		Total	
Grade	N	%	N	%	N	%
7	482	51.3	404	39.7	886	45.3
8	361	38.4	451	44.3	812	41.5
9	69	7.3	162	15.9	231	11.8
10	17	1.8	0	0.0	17	.9
11	9	1.0	0	0.0	9	.5
12	1	.1	0	0.0	1	.1
Total	939	100.0	1017	100.0	1956	100.0

Demographic characteristics for the 1,956 students (984 female, 972 male) are represented in Table 6. Approximately half of the students were Caucasian (52.9%), 40.1% African American, 5.8% Hispanic, 0.8% Asian, and 0.4% Native American. More than half (53.2%) of the students received free or reduced lunch. Only a small percentage of students were classified as special education (11.6%) or English Language Learner (7.0%). Because the teachers and schools in 2008-09 and 2009-10 were the same, the groups were demographically very similar.

Table 6. *Demographic Characteristics of Study Participants*

Demographic Characteristics	2008-2009		2009-2010		Total	
Gender	N	%	N	%	N	%
Female	492	52.4	492	48.4	984	50.3
Male	447	47.6	525	51.6	972	49.7
Ethnicity						
Caucasian	467	49.7	487	47.9	954	52.9
African American	345	36.7	378	37.2	723	40.1
Hispanic	105	11.2	114	11.2	105	5.8
Asian	15	1.6	20	2.0	15	.8
Native American	7	.7	17	1.7	7	.4
Meal Status						
Full-Price Lunch	462	49.2	453	44.5	915	46.8
Free/Reduced Lunch	477	50.8	564	55.5	1041	53.2
Special Education Status						
No SPED	834	88.8	896	88.1	1730	88.4
SPED	105	11.2	121	11.9	226	11.6
ELL Status						
No ELL	838	89.2	982	96.6	1820	93.0
ELL	101	10.8	35	3.4	136	7.0

To examine whether mean differences in CRT scores between the 2008-2009 (pre-OSMP training) and 2009-2010 (post-OSMP training) school years exist, analysis of variance was conducted. This analysis was conducted at each grade level. Students take different tests in each grade level so it was important to assess CRT differences within grade level. As you can see in Table 7, changes in time were significant; however, these differences were not consistent across grade level. Although 7th graders taught by OSMP teachers did not improve after training, 8th and 9th graders did improve (see Figure 3). As can be seen in Figure 4, 8th and 9th grade students taught by OSMP teachers had higher AYP scores than the district average; however, this was true both prior to and after the OSMP training. Seventh graders, on the other hand, did better that the district average prior to OSMP training, but worse after training took place.

Table 7. *Mean CRT Scores by Grade Level*

Teacher	District Average 08/09	District Average 09/10	Pre-OSMP 2008-2009		Post-OSMP 2009-2010		Significance Test
			M	SD	M	SD	p
7th Grade							
ST1	3.12	3.12	3.24	.79	2.78	1.01	.00*
ST2	3.26	3.27	3.48	.81	3.23	.89	.00*
ST3	3.39	3.36	3.57	.80	3.41	.92	.01*
ST4	2.77	2.74	3.25	.89	2.83	1.14	.00*
ST5	3.17	3.14	3.45	.87	3.07	1.16	.00*
ST6	3.07	2.98	3.14	1.17	2.58	1.37	.00*
AYP Score	3.19	3.16	3.40	.63	3.14	.70	.00*
Standards Mastered	4.60	4.54	5.05	1.53	4.35	1.79	.00*
8th Grade							
ST1	3.13	3.23	3.48	.80	3.27	.90	.00*
ST2	2.89	2.99	3.25	.98	3.48	.88	.00*
ST3	3.22	3.26	3.59	.83	3.66	.77	.23
ST4	3.14	3.25	3.57	.75	3.67	.71	.07
ST5	2.89	2.99	3.10	1.03	3.42	.92	.00*
ST6	2.76	3.01	3.11	.92	3.32	.95	.00*
AYP Score	3.08	3.17	3.36	.65	3.48	.63	.02*
Standards Mastered	4.26	4.49	4.96	1.49	5.16	1.39	.06
9th Grade							
ST1	2.76	2.85	3.18	.99	3.13	.98	.68
ST2	2.32	2.60	2.87	1.20	2.63	1.20	.10
ST3	2.51	2.81	3.05	1.18	3.01	1.18	.75
ST4	2.34	2.57	2.72	.99	2.69	1.20	.81
ST5	2.28	2.55	2.86	1.18	2.78	1.30	.57
ST6	2.64	2.90	3.14	1.03	3.01	1.13	.31
AYP Score	2.62	2.80	3.06	.80	2.96	.90	.37
Standards Mastered	3.18	3.68	4.28	2.08	3.95	2.04	.17

Figure 3. *AYP Scores by for Pre-OSMP and Post-OSMP by Grade Level*

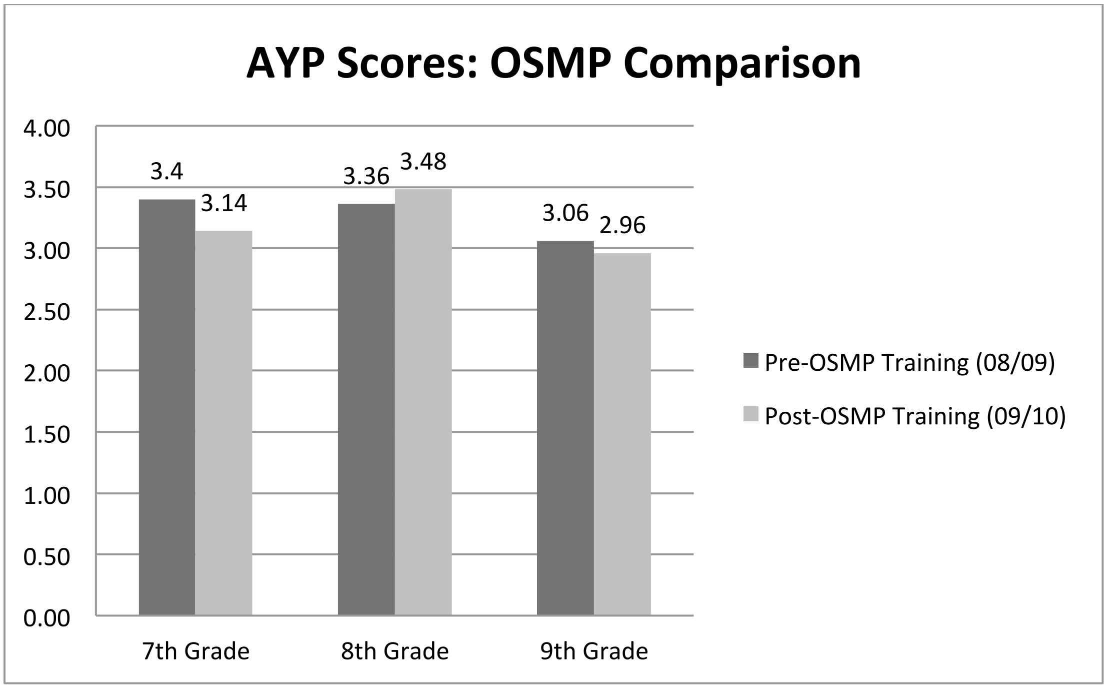
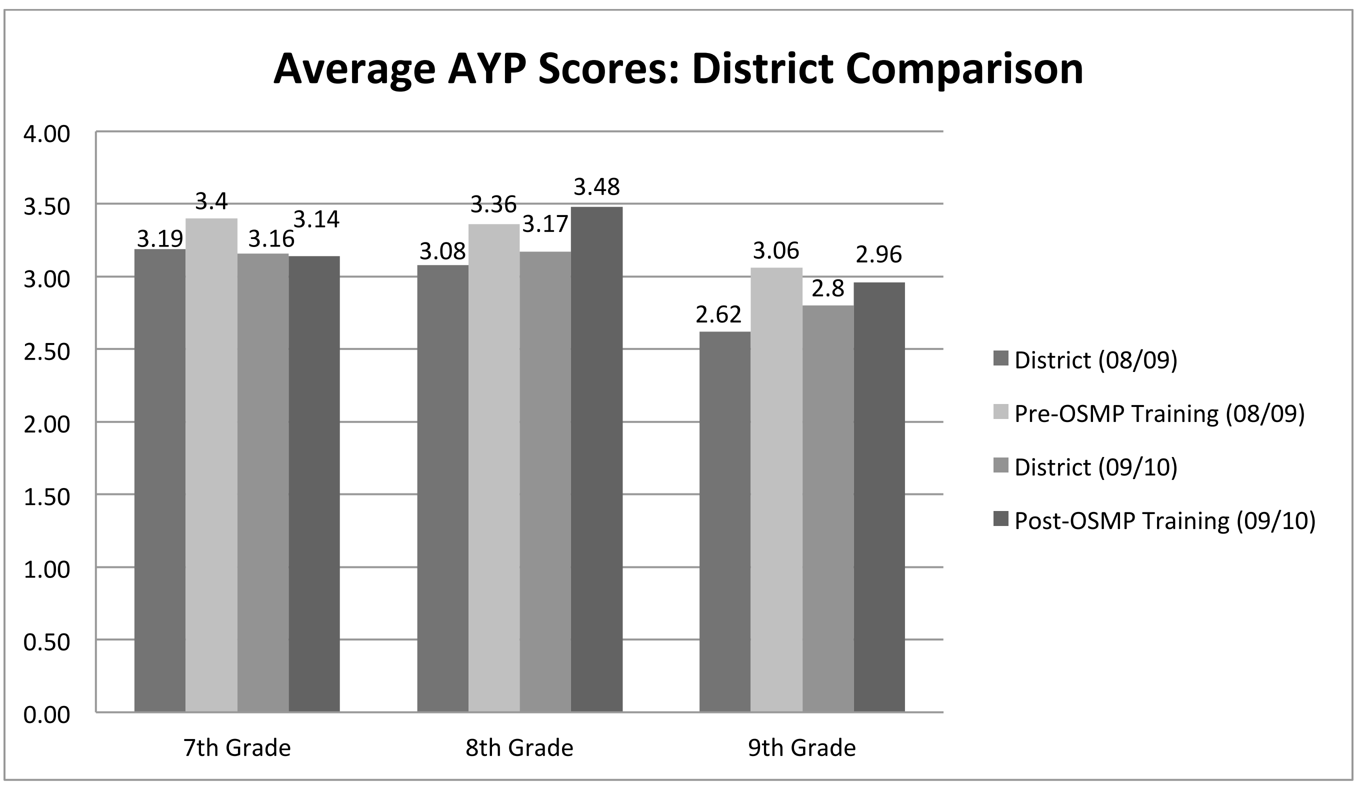


Figure 4. *AYP Scores for District, Pre-OSMP, and Post-OSMP by Grade Level*



Omaha SCIENCE MEDIA PROJECT

2010 Workshop Evaluation: Teacher Survey Results

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with assistance from Leah Carpenter

November 2010

CENTER FOR INSTRUCTIONAL INNOVATION
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UNIVERSITY OF Nebraska Lincoln

Introduction

Project Description

The Omaha Science Media Project (OSMP) is a two-year project funded by the Omaha Schools Foundation to enhance Omaha Public School (OPS) teachers' understanding of scientific research. This collaborative initiative involves OPS, University of Nebraska Medical Center, Nebraska Center for Virology, Center for Biopreparedness Education, Nebraska Educational Telecommunications, Soundprint Media Center, Inc., University of Nebraska-Lincoln College of Journalism and Mass Communications, University of Nebraska State Museum, and the Center for Multidisciplinary Programs in Education Sciences at Northwestern University. The underlying concept of the OSMP is to use media production, including radio, video and multimedia, to enhance teaching and learning about science and scientific research. The hypothesis underpinning work of the OSMP is that science teachers can improve their science pedagogy by participating in intensive professional development experiences during which they produce media deliverables focused on the latest biomedical research topics. OSMP project leaders anticipated that student learning and interest in science and health careers would increase as teachers infused their new knowledge into the classroom.

OSMP 2009

The first year of the project centered around a two-week summer workshop involving sixteen teachers and fifteen students from the Omaha Public Schools in an intensive, collaborative workshop about viruses and infectious disease in July 2009. Teaming up with media professionals and content specialists, these teachers and students worked as science journalists to create media productions (audio, video, and multimedia) focusing on virology research topics. The OSMP workshop model included three important design features that OSMP leaders identified as key and somewhat unique among teacher internship professional development programs. These features were:

1) Participant immersion in a virology research project for two weeks, including access to research staff, labs, and to a full-time mentor.
2) Inclusion of students as peers in the learning and production teams.
3) Development of media products as an outcome, with continuous access to media mentors to facilitate this goal.

The goals of the project were 1) to produce high-quality, classroom-ready media products about virus topics that would be relevant to students in middle and high school and tied to Nebraska and National Science Education Standards, 2) to improve the pedagogy of these teachers through experiential professional development, 3) to establish the foundation for long-term partnerships between Omaha Public Schools and Nebraska's biomedical institutions, and 4) to explore media creation as a strategy for making science relevant for students.

The project's media mentors finalized the media products by January 2010, and these are available to Omaha Public School teachers as online curriculum resources. In addition to these media products, OSMP project leaders anticipated that as the teachers learned media and journalistic skills and infused them into their classroom teaching, student learning and interest in science and health careers would increase. Evaluation results on the OSMP 2009 workshop

(Spiegel, 2010) found that participating teachers felt that they had learned valuable skills to use in their classrooms. At the end of the workshop, these teachers anticipated they would see an increase in student motivation and interest by using media and current science research and by making the content more relevant to their students. In a follow-up evaluation after the workshop (Spiegel, 2009), all the participating teachers indicated that they had begun to incorporate student-generated media in their curriculum, and the majority were creating media content themselves and using their new science media skills to enhance the curriculum, as well as collaborating with other teachers on different media projects. The evaluation results concluded that the three identified features of the workshop, participant immersion, student inclusion and the goal of media products, were important contributing factors to the success of the workshop, and that the format of using small teams was a strength. Group dynamics within the teams, however, was a challenge, especially given the complexity of the finished product. Teachers also found the limited time of the workshop to gain expertise on the media equipment and software to be challenging. Recommendations included providing participants with more preparation to work in collaborative groups and using simpler media tools that teachers could utilize more readily and that could be made available to classrooms with fewer resources.

OSMP 2010

OSMP leaders and staff initiated a second workshop, OSMP 2010, based on feedback and reflection on the 2009 workshop, program goals, and available resources. While the overarching goal of infusing journalistic media skills into science teaching remained consistent, OSMP staff structured this second workshop somewhat differently. Prior to the workshop, teachers identified topics they found challenging to teach in the past. During the one-week workshop, teachers focused on this content, working in small group production teams. This workshop did not include science research immersion, and the teachers did not have direct access to science researchers or content experts. Media mentors were available but did not serve as members of production teams. Returning teachers from the 2009 OSMP workshop served as mentors for their colleagues, and the 2010 participating students were involved in a role more similar to a typical classroom situation, rather than as peers with the teachers. The goals of the 2010 workshop complemented the 2009 OSMP workshop by focusing on teachers creating media and simulating a classroom environment with students, and continuing to grow the cohort of innovative science teachers in OPS.

Purpose of Evaluation

This evaluation describes the feedback provided by the 2010 OSMP workshop participants, including the returning 2009 participants. The goal of this report is to help the project staff, the funding agency, and other educators and administrators better understand participants' experiences and provide relevant information for planning future teacher workshops incorporating media production. This report reflects on the process and considers some of the strengths and challenges of the 2010 summer workshop and the project as a whole. The questions guiding the workshop evaluation were:

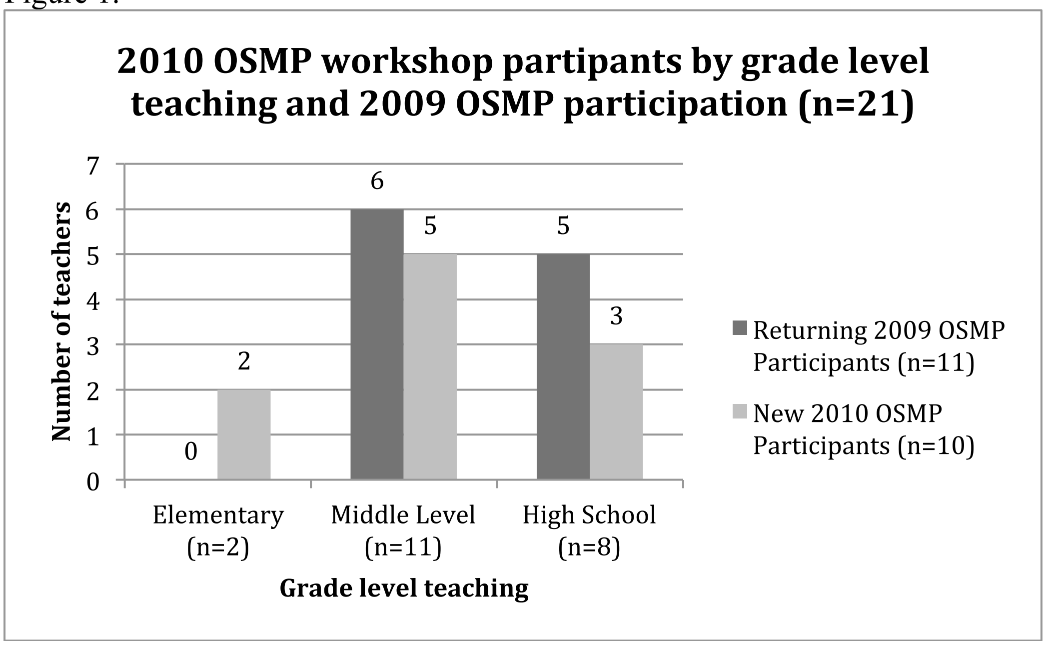
1) To what extent did teachers' find the lessons they developed during the workshop useful for their teaching?
2) To what extent did the workshop prepare teachers to continue to develop science media lessons for their classrooms?
3) For the returning 2009 OSMP participants, how have they made use of their new skills in their classrooms during the last school year?

Methods

Participants

Twenty-one OPS teachers participated in the 2010 one-week summer workshop. These 21 teachers included eleven returning 2009 OSMP participants as well as 10 newly involved teachers who were recruited by the returning OSMP teachers (see Figure 1). Similar to the 2009 workshop, the participating teachers included journalism (n=1) and technology (n=2) teachers as well science teachers (n=16). Teachers from upper elementary to high school were included in the 2010 participants. In addition to the teachers, 41 students, including 11 returning 2009 OSMP participating students, were involved in the 2010 workshop.

Figure 1.



Data collection and Instrument

On the last day of the July 2010 workshop, we asked all the participating teachers to complete a written survey about their workshop experiences. Completion of the survey took approximately 15–20 minutes. The evaluator developed the survey instrument in consultation with OSMP partners, including the Project Director, the OPS Coordinator, and other staff (see Appendix for a copy of the survey). Both the University of Nebraska Institutional Review Board and the Omaha Public Schools Research Review Committee approved all procedures and the survey instrument for use prior to data collection.

Results

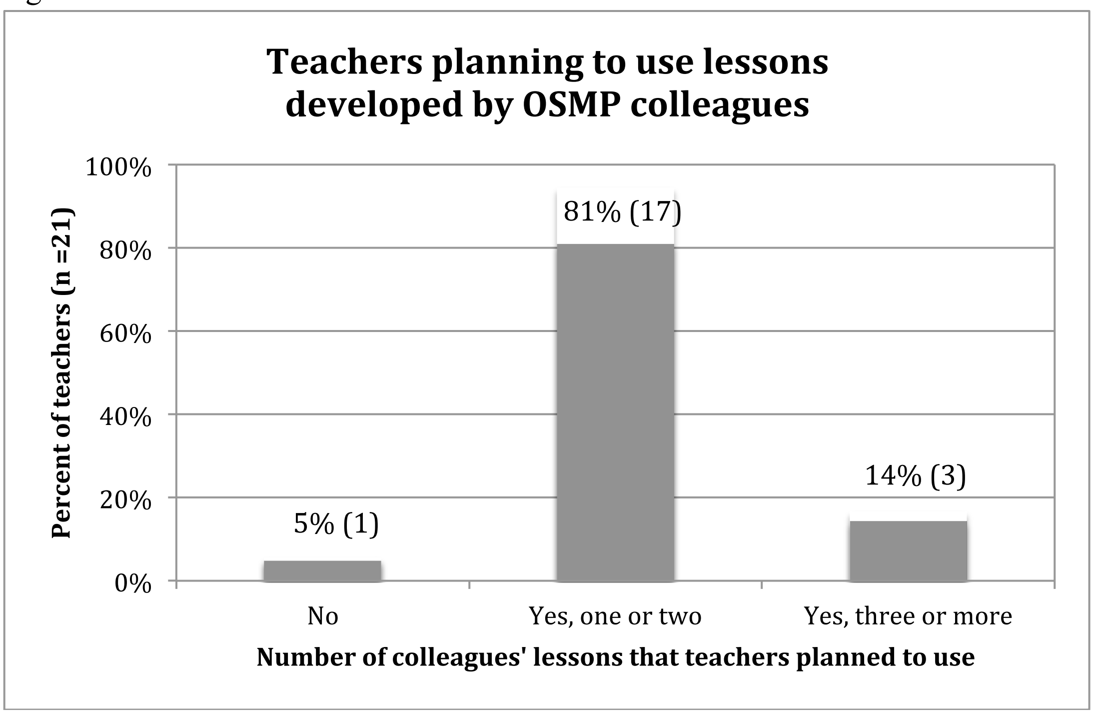
This report presents information about the perceived utility and quality of the lessons developed, the implementation of the lessons and science media skills, and the workshop itself. This includes feedback from the returning 2009 OSMP teachers on how they used their OSMP skills in their classrooms over the past year.

Utility of lesson developed

We asked participating teachers how well the lessons they developed at the 2010 OSMP workshop would fit into their current course plan. All of the teachers indicated that they had already integrated the lesson into their course plan (10 teachers) or knew where it would fit (11 teachers). None of the teachers expressed uncertainty about the utility of the lesson in their own classrooms.

Another goal of the lesson development was for the lessons to be transferrable from one classroom to another, so a lesson developed by one teacher could be readily used by another. To assess the extent to which teachers felt able to use lessons developed by their OSMP colleagues, we asked whether participants planned to make use of any lessons besides their own. All but one teacher planned to use not only their own lesson(s), but others' as well (see Figure 2).

Figure 2.



Quality of lessons developed

Prior to the OSMP 2010 workshop, participating teachers identified content areas that they found difficult to teach for a variety of reasons, including genetics, evolution, density/properties of liquids, and recycling/sustainability. These content areas then provided the focus around which the 2010 workshop lessons were developed. We asked teachers to rate how the new lessons they had developed over the course of the week compared to a typical lesson in the same course, with respect to content difficulty, level of engagement for students and other qualities. In most cases, teachers rated their new lessons more interesting, engaging, memorable and meaningful to their students. With respect to content difficulty, teachers most often rated the newly developed lessons as similar to a typical lesson (see Figure 3).

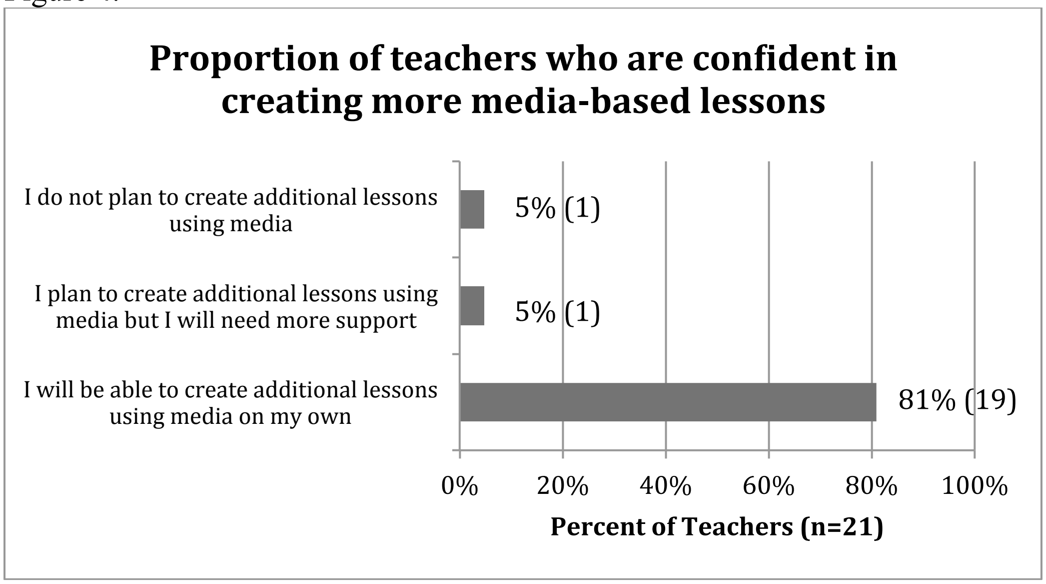
Figure 3.

Compared to an average lesson, new OSMP lesson is…			
In content difficulty	Less rigorous in content difficulty 10% (2)	Equally as rigorous in content difficulty 48% (10)	More rigorous in content difficulty 33% (7)
In how meaningful to students	Less meaningful to students 0% (0)	Equally as meaningful to students 29% (6)	More meaningful to students 71% (15)
In interest level of students	Less interesting to students 0% (0)	Equally as interesting to students 14% (3)	More interesting to students 86% (18)
In how well students will remember it	Less memorable for students 0% (0)	Equally as memorable for students 19% (4)	More memorable for students 81% (17)
In how engaging it is for students	Students will be less engaged 0% (0)	Students will be equally engaged 19% (4)	Students will be more engaged 81% (17)

Implementation

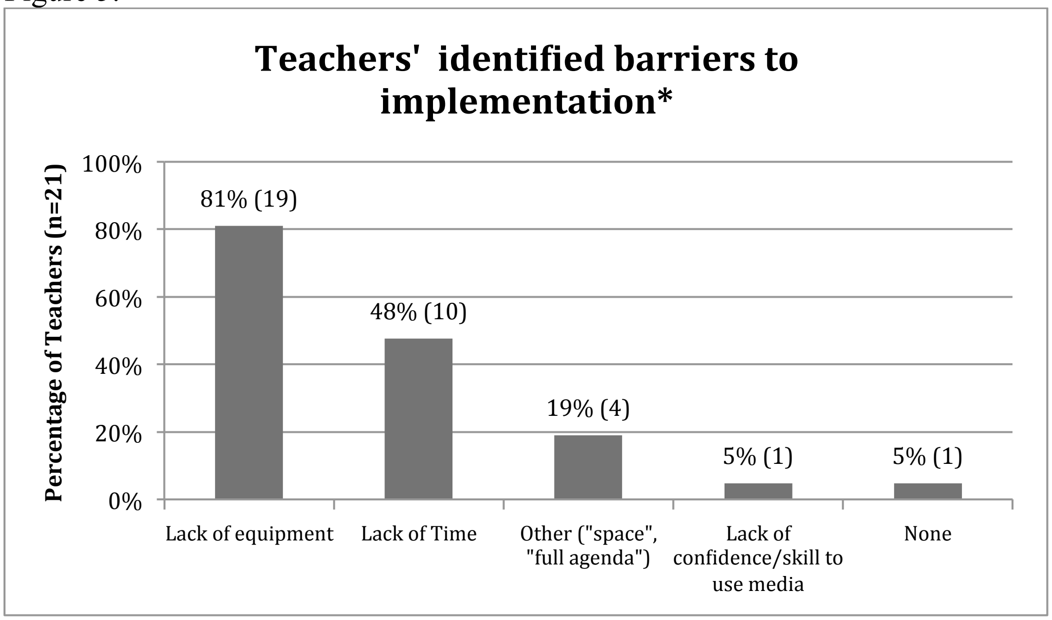
One goal of the OSMP workshop was for teachers to develop the skills and confidence to continue to develop additional lessons using science media. When asked whether they planned to create additional lessons, the large majority of teachers felt they would be able to do that (see Figure 4).

Figure 4.



Teachers saw significant barriers to implementation of media-based lessons in their classroom, however. The most commonly perceived barrier was lack of equipment, cited by over 80% of teachers (see Figure 5). Lack of time, both with respect to time in the curriculum as well as time to plan, was also seen as problematic by over half of the participating teachers. Only one teacher, a media specialist, saw no significant barriers to implementation.

Figure 5.

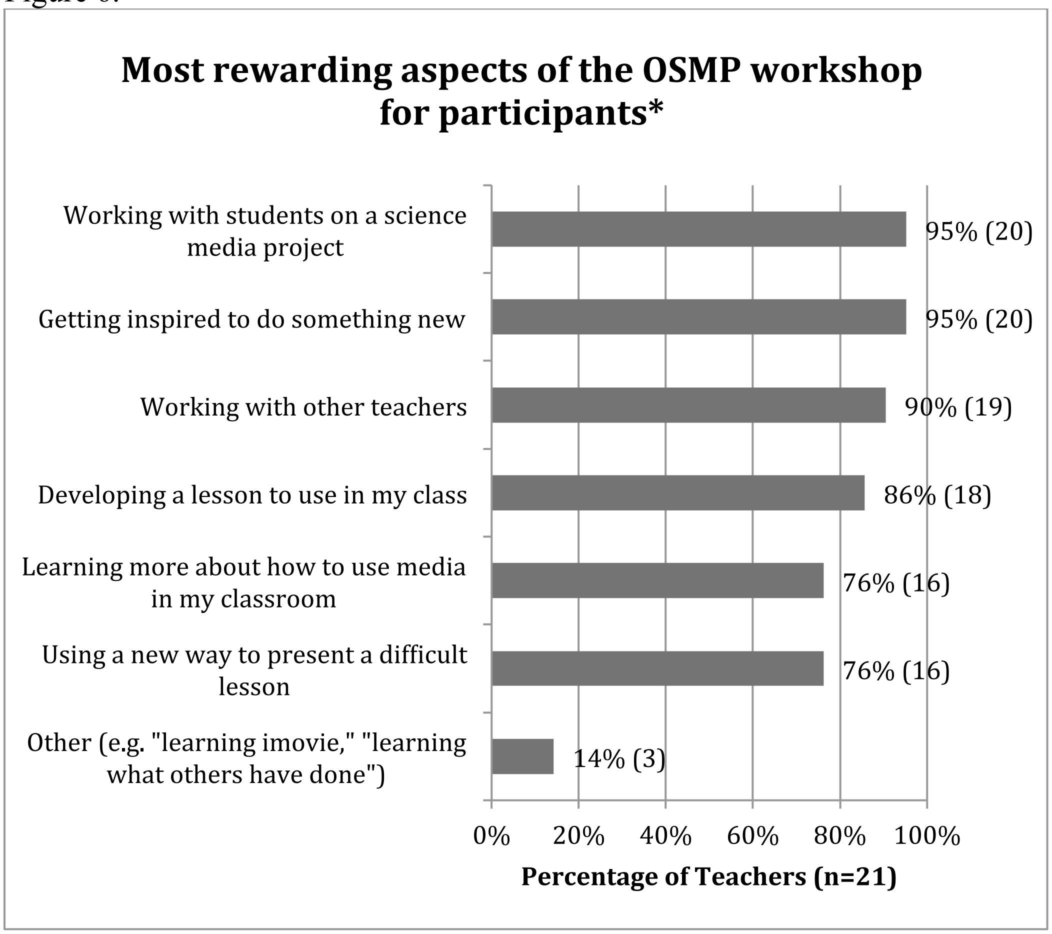


*teachers marked multiple responses

Workshop Feedback

We asked teachers what they found to be the most rewarding and most challenging about their weeklong experiences. Overall, teachers' responses about rewarding aspects were more numerous and varied than the challenging aspects. Similar to the 2009 workshop, teachers found it motivating to work with science media tools, enjoyed the opportunity to work with colleagues and to work directly with students, liked developing a lesson that was usable for their own classes, and enjoyed learning new things about media and a new approach to teaching (see Figure 6).

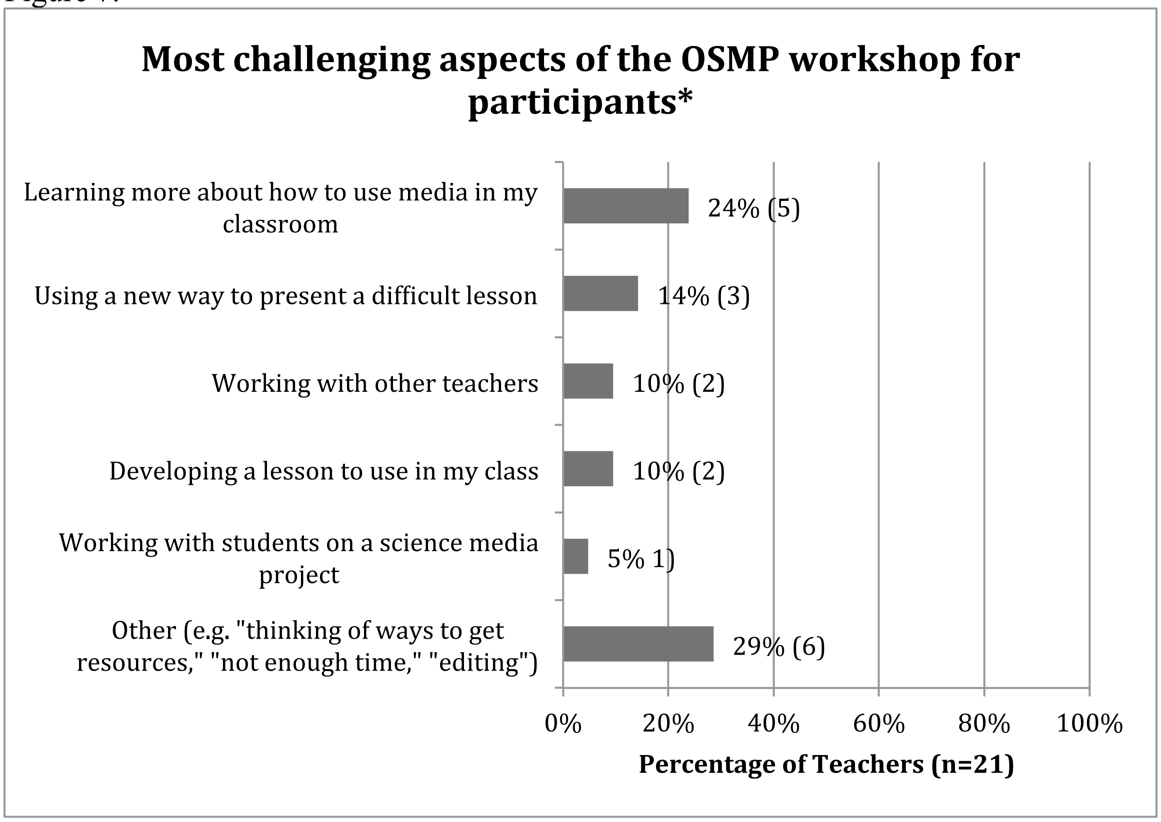
Figure 6.



*teachers marked multiple responses

About one-fourth of the participating teachers identified learning to use the media tools in their classroom as their primary challenge. Others identified the lack of time, and lack of appropriate space (see Figure 7).

Figure 7.



*teachers marked multiple responses

A few teachers did not identify any aspects of the workshop as "most challenging," indicating they "loved" all of it.

Plans for classroom implementation

The participating teachers envisioned diverse ways to integrate their new skills into their classrooms, using both teacher-created media and student-created media. They saw multiple applications in the classroom and the lab setting, including documenting and presenting student work, assessing students, and using media as a means for students to teach each other. Specific comments included, "I will look for every possible opportunity to offer alternate means for student learning and assessment of student learning through media-related activities," and "[I see this] as a way for students to teach each other specific concepts."

Teachers also saw science media as a way to increase class participation, be more inclusive of ESL/special education students, create additional student centered activities and enhance science journalism. Teachers reported, "I believe this is a great way to accommodate ESL/special education students in the classroom," and "[I plan on] developing awareness in my journalism classes about the importance of science journalism!"

Some teachers anticipated expanding the curriculum and extending the use of media beyond science, with comments such as "I can use similar technologies to create more relevant assignments, not only in science but in other subject areas."

Teachers also recognized the applicability of science media beyond the classroom, describing how they plan to use it to share and collaborate with colleagues, with comments such as, "I plan on sharing this idea and a few examples with the staff at my building during a professional development meeting, and "I would like to show other teachers how media projects can be a natural fit with any content." One teacher also described reaching beyond the district, noting, "I have already presented at a national conference and plan to do so again."

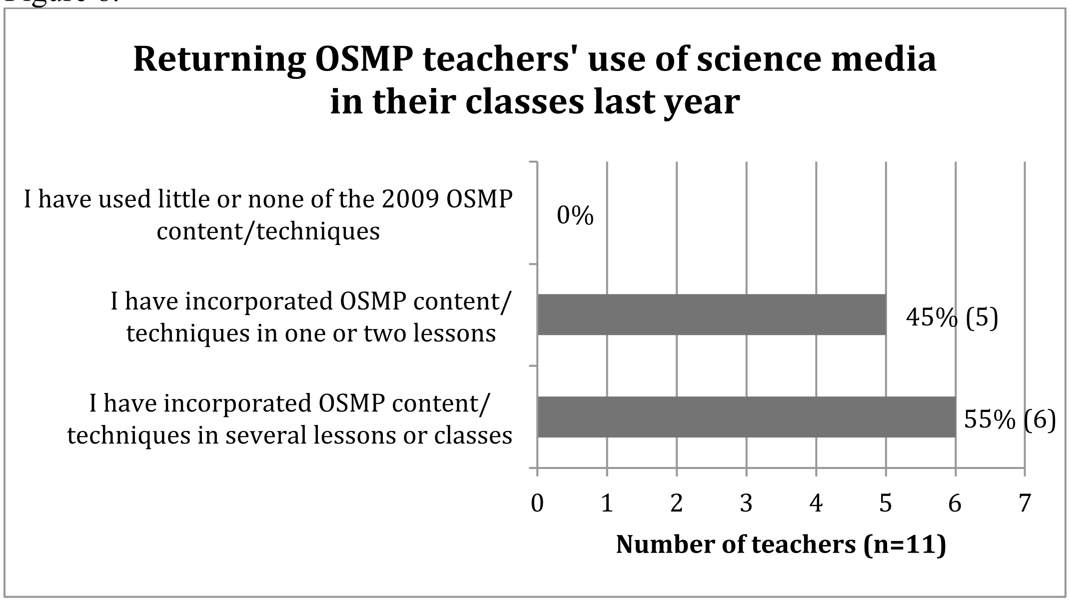
Some teachers envisioned the utility of science media in enhancing parent-teacher relations, with one teacher writing, "I plan to increase the quality of my communication with parents about what their children are doing in school.

Some teachers also anticipated expanding their skills by learning additional software tools, as one teacher detailed, "Hopefully, I can learn more software that I can use in class. For example, I would love to learn GarageBand and be able to integrate it into iMovie. I would also like to learn more about Windows movie media."

2009 OSMP participants report on using science media in 2009-2010 school year

To understand the extent and nature of how the returning OSMP teachers used what they had learned in the previous summer OSMP workshop in their classrooms, we included two questions in the survey about their 2009-2010 school year. All the returning teachers indicated that they had incorporated OSMP content and/or techniques into their classes (see Figure 8 below), and the majority had found multiple applications for using science media.

Figure 8.



Teachers who indicated they had more limited application of their OSMP skills in the last year (in one or two lessons) described some of the ways they directly incorporated science media in their lessons, labs, and assessments, both creating media themselves and having students create media products. One teacher explained, “At the end of the year my students in one class were given a choice of taking my 50 question final exam or producing a media project based on any of the science content learned from the past 2 years in class.” Another teacher wrote that s/he “recorded inquiry lab, recorded dissection lab, recorded powerpoint presentations. [I also] had students develop lesson of topic from the year using flip and video camera.”

One teacher also specifically indicated that participating in the second workshop helped increased her confidence to do more in her classroom, saying,

> *[Last year] I had my students work on a science story to be presented in audio only, since I wasn't confident about my video editing skills. Now I feel more confident about video, so I can incorporate that component in my classroom.*

Of the returning OSMP teachers who indicated more extensive use of their science media skills in the past year (across several lessons or classes) some teachers described consistently using media making, writing that “Students video tape labs and projects at least one activity per unit,” and “I offer more choices that offer creating media projects/video.” Another teacher wrote, “I designed and implemented a small scale semester-long media project for 12 of my students.”

One teacher indicated using media skills beyond science, writing, “I am continually using journalistic technologies in many projects in different curriculum areas.” Other teachers described more specific applications, such as, “We used video to document classroom ‘trials’ about the ‘color of blood inside the human body’ and the ‘ethics of cloning humans.’” These descriptions sometimes also included some difficulties teachers encountered, as in this example, “[We] used video to create stories about the animals living in the classroom. In all cases, we collected much footage, but bogged down in time and editing skills. We did not complete any "finished products" but can continue working with footage.”

These descriptions indicate that across grade levels and topic areas, the returning OSMP teachers incorporated science media and journalistic techniques in their classrooms.

Conclusions

The OSMP leaders designed the 2010 workshop to complement the 2009 workshop, with the goal of growing the cohort of innovative science teachers in OPS using science media in their teaching. To accomplish this, they focused on having teachers create media in the workshop and by simulating a classroom environment with students. The written feedback from teachers indicates that this overall goal was met.

A strength of the 2010 OSMP workshop was having the participating teachers select the topics they would develop into media lessons during the workshop. This insured that the lessons were relevant and fit within the curriculum and the teachers’ individual course plans. Overall, the participating teachers felt that the quality of the new science media lessons were comparable in difficulty but more engaging and meaningful to students than a typical lesson. This indicated the perceived added value of integrating science media to capture students’ attention and make the content more relevant to them. Providing teachers with the opportunity to collaborate with one another was an important feature of the workshop. The use of more readily available and accessible equipment meant teachers were able to successfully complete the design and implementation of media-based science lessons with students within the allotted time of the workshop.

In summary, the teachers participating in the OSMP 2010 workshop reported that the lessons they developed and the skills they acquired would be directly applicable to their classrooms, and would help them make their curriculum more meaningful, interesting and engaging. They found working with other teachers and students rewarding, and they enjoyed learning more about media and using a new way to present difficult material. Participating teachers left the OSMP 2010 workshop feeling capable of creating and using media in their classrooms. These teachers, however, still saw lack of available equipment for students and lack of time in the curriculum as significant barriers to implementing science media assignments in their classrooms. In spite of these barriers, the returning OSMP teachers reported using their science media skills in substantive ways during the last school year. This suggests that even with limited tools and time, the 2010 OSMP participants are likely to implement science media teaching in their classrooms.

References

Spiegel, A. N. (2010) *Omaha Science Media Project 2009 Workshop Evaluation Summary.* Lincoln, NE: Center for Instructional Innovation, University of Nebraska–Lincoln.

Spiegel, A. N. (2009) *Omaha Science Media Project 2009 Workshop Follow-up Report: Teachers' Plans and Activities Using New Science Media Skills.* Lincoln, NE: Center for Instructional Innovation, University of Nebraska–Lincoln.

Appendix

Omaha Science Media Project
2010 Workshop Feedback

Teacher name: ______________________________ Grade level(s) teaching ________

School name: _______________________________ Part of 2009 OSMP? Yes No

1. How confident are you that you will be able to use the lesson you've developed this week with your students in the coming year? (circle one)

I have already integrated this lesson into my course plan	I have a good idea of where this will fit into my course plan	I'm not sure this will fit into my course plan	I doubt I'll be able to use this lesson in the coming year

2. Compared with an average lesson from the same course level, how would you rate the lesson you've developed this week?

In content difficulty:	Less rigorous in content difficulty	Equally as rigorous in content difficulty	More rigorous in content difficulty
In how meaningful to students:	Less meaningful to students	Equally as meaningful to students	More meaningful to students
In interest level of students:	Less interesting to students	Equally as interesting to students	More interesting to students
In how well students will remember it:	Less memorable for students	Equally as memorable for students	More memorable for students
In how engaging it is for students:	Students will be less engaged	Students will be equally engaged	Students will be more engaged

3. Aside from the lesson you developed yourself, are you planning to use or adapt any lessons that other OSMP participants developed this week for your own classroom use?

   ___ No
   ___ Yes, one or two
   ___ Yes, three or more

4. Do you plan to create additional science media assignments or lessons for your students based on what you've learned this week? (circle one)

I do not plan to create additional lessons using media	I plan to create additional lessons using media but I will need more support	I will be able to create additional lessons using media on my own

5. What significant barriers to implementation do you foresee for implementing science media assignments in your class?

   ___ None
   ___ Lack of equipment
   ___ Lack of confidence/skill to use media
   ___ Lack of time
   ___ Other: ____

6. What were the most rewarding aspects of this workshop for you? (check all that apply)
   ___ Working with other teachers
   ___ Developing a lesson to use in my class
   ___ Working with students on a science media project
   ___ Learning more about how to use media in my classroom
   ___ Using a new way to present a difficult lesson
   ___ Getting inspired to do something new
   ___ Other: ____

   ____

7. What were the most challenging aspects of this workshop for you?
   ___ Working with other teachers
   ___ Developing a lesson to use in my class
   ___ Working with students on a science media project
   ___ Learning more about how to use media in my classroom
   ___ Using a new way to present a difficult lesson
   ___ Other: ____

   ____

8. Other than what you've already answered, how will you use what you've learned at OSMP in the future?

9. If you were a 2009 OSMP participant, to what extent have you been able to incorporate what you learned into your teaching last year?

I have used little or none of the 2009 OSMP content/techniques	I have incorporated OSMP content/techniques in one to two lessons	I have incorporated OSMP content/techniques in several lessons or classes

10. Please describe: