Knowledge Networking in Electronic Environments: A Values Inquiry Project

Mark Szymanski
Pacific University

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Knowledge Networking in Electronic Environments: A Values Inquiry Project

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Berglund Center for Internet Studies Fellowship Report

By Dr. Mark Szymanski
Pacific University

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Introduction:
For this fellowship I designed and directed an internet supported problem-based project. The foundation of the project was the creation of a learning experience that was made possible partially through the development of an electronic community. The community members were high school freshmen in an integrated liberal arts learning community in a high school and experts involved in managing and developing policy for the Waldo Lake Wilderness Area. The primary activity for the project had the students examine how personal values effect the preservation of a sacred place. This examination was supported by the use of electronic communication environments and electronic resources on the world wide web.

Specifically, for this project high school students investigated how community and personal values influence the land and water management in and around Waldo Lake, one of the purest lakes in the world. Waldo Lake is located 75 miles east of Eugene, Oregon in the Cascade Mountain Range and is considered by many people to be a sacred place. The students’ teachers and I guided the students’ investigations. The project required students to communicate with people and organizations who are involved in developing and implementing land and water management in the Waldo Lake Wilderness Area.

My primary role in the project was to create and support the learning experience and the community. In addition, I supported the students’ work by teaching them the technology skills they needed to participate as members of the electronic community. I also supported the
development of their final products which were web sites, maps, persuasive essays, and persuasive speeches that answered their research questions:

1. Why is Waldo Lake considered sacred to so many Oregonians (humans and animals) and what values underlie this consideration?
2. What is threatening this sacred place?
3. Should we work to preserve the pristine quality of Waldo Lake or should compromises be made to satisfy all of the major stakeholders?

This fellowship supported my time and work on this project. For this final report I would like to address three areas that capture the value of this project to me, the students, the teachers, and the Berglund Center for Internet Studies. These areas are: the rationale for the project, the procedure and my role in the project, the research questions for the project.

**Rationale: Knowledge Networking**

For this project I set out to create an electronic community and design an internet supported problem-based learning project that was based on principles of knowledge networking and cognitive science. Salomon and Perkins (1996) describe knowledge networking as learning experiences in which learners actively construct knowledge and build semantic networks through the sharing of knowledge across social and physical networks. Knowledge networking is a framework for learning that relies on communication and can be improved by using electronic communication tools. The guiding framework of knowledge networking combined with the use of communication tools and the world wide web as a source of information can transform the learning process. But, this transformation can only take place if teachers and students learn how to use technology in ways that change how students think (Perkins, 1985). Salomon and Perkins (1996) point out that the best learning experiences take place when they are based on "what learning demands, not what technology can do" (p. 114). Too often educators and students have been seduced by new software and hardware that promises to make learning more efficient, but makes no fundamental changes in the original design of a learning experiences that helps students improve their higher order thinking skills. Taking this into consideration, this project was an attempt to design a learning experience in which technology helped change the way learning took place in school. The unique nature of the project wasn’t the technology we used, it was in how we used the technology.

The essential elements of knowledge networking served as the project’s foundation. As interfaces improve and electronic communication tools (email, bulletin boards, instant messaging) become easier to use, the challenge for educators involves learning how to use these tools in ways that allows students to do things they wouldn’t be able to do without the communication tools.

Knowledge networking is a constructivist approach to learning. A constructivist learning experience allows students to build their own understandings through activities that require them to use higher order thinking skills to generate understanding (Sternberg & Williams, 2002). In a
practical sense, students are required to synthesize and apply the information they work with. This information is typically primary source material and communications with experts in a field.

Taking this a step further, a constructivist learning experience that takes place in a real life context is referred to as situated learning. In this view, the learning environment and the social factors in the learning environment play an important role in learning (Derry & Lesgold, 1996; Greeno, 1989, 1998). “People learn the meanings and significance of objects and information in the situation in which they are working from their roles and activities in the situation” (Greeno, Moore, & Smith, 1993, p. 100). In this model, the experts facilitate the student thinking by structuring their answers to students’ questions in a way that is consistent with the current level of the students’ understanding. In addition, this model allows the experts to ask questions that probe the thinking of the students. In this model learning takes place in a kind of cognitive apprenticeship between the novice students and the experts (Green et al, 1996). Vygotsky (1978) believed this type of mediated learning resulted in students being able to reach levels of understanding they would not have been able to reach without this scaffolding or gradually decreasing levels of support. Understanding and cognitive development occur most effectively and efficiently through social interaction (Vygotsky, 1962, 1978) and in context specific situations (Lave & Wenger, 1991).

Students that participate in a cognitive apprenticeship construct their own structures of meaning. People often use the term semantic networks, or structures of meaning, to describe how knowledge is organized and stored in memory. Semantic networks integrate declarative knowledge with interpretation (Jonassen et al., 1993; Von Eckardt, 1999). This can also be thought of as a process where students are continually comparing what they already understand with the new information they are interpreting. This understanding is mediated by experiences. Specifically, to be most effective, these learning experiences should be “embedded in a social and activity setting rich in ways that foster the development of particularized adaptive knowledge and resonant with later potential applications” (Salomon and Perkins, 1996, p.122). Thus, knowledge networking in the context of this project changed the learning environment of school. I conceptualized this project as a networking pedagogy supported by the use of electronic communication tools. In this knowledge networking environment learning can be characterized by five essential elements. The five elements were incorporated into the design of the project. Next, I would like to describe each element and the manner in which each element was integrated into the project.

**Element 1: Learning is driven by real-life problems or issues.**

For this project students investigated a real and developing public policy issue that was driven by two basic questions: How do we manage a public sacred place? What values underlie those decisions? As students considered these questions through more specific research questions, it was clear that the real-life nature of the project helped the students maintain their motivation. These real-life problems provide natural frameworks for learning (Gardner, 2000). This stands in contrast to the standard work teachers do with students in the artificial context of school. In this artificial context students-theoretically-learn the skills they will need to negotiate real-life problems
when they leave school. Traditionally, schools have relied on these artificial contexts in part because of the physical and time constraints of the learning environments in school. Now that students have access to the internet in schools administrators and teachers are being more flexible with time and physical constraints, this barrier is gradually being lifted. Consequently, educators are faced with new options for designing learning experiences.

The real life nature of this project was brought to life in two basic ways. First, the students communicated directly with people who were involved in developing the policy for managing the Waldo Lake Wilderness Area. They included members of the Willamette National Forest (1) as well as members of the Waldo Lake Wilderness Council (2). In addition, the teachers and I shared our personal experiences with the Waldo Lake Wilderness Area with the students. To start the project, I created and presented an electronic slide show to the students in which I outlined the basic description of the area and the issues related to the management. The organization and highlighting of the issues along with the photographs of the area helped the students understand the issues facing the management of the area. The best way to familiarize the students with the area would have been to take them there as a group. But, because of a budget constraints in the school district, there were no funds available for field trips.

**Element 2: Learning focuses on knowledge gathering, selecting, and arranging.**

Learning theory tells us that when students have to gather, select, and arrange relevant information in a meaningful way, they develop a deeper understanding of what they have learned (Gardner, 2000; Novak & Gowin, 1984; Perkins & Salomon, 1989). This project placed a premium on this aspect of knowledge networking. In the procedure section I provide a detailed description of how students gathered, selected, and arranged information. In a broad sense, for this project students gathered information in two ways: one way was through participating in an electronic community in which they interacted with experts in the field and with each other; in addition, students accessed information from a number of web sites.

After they gathered this information, students selected what they considered important information based on the research questions that guided their project. This part of the project forced students to use higher order thinking skills. The arrangement of this information happened when the students completed the final products for the project.

**Element 3: Learning is multidisciplinary and builds networks of meaningful connections.**

For the project, students were enrolled in an integrated liberal arts learning community at their high school. The learning community was designed to facilitate multidisciplinary inquiry and curriculum. For any multidisciplinary project to be successful, the traditional division of subject areas and time in schools has to be altered. As Greeno (1996) states, knowledge does not exist in isolation. We organize and categorize it for the convenience of study and scholarship. For this project, the English teacher, the science teacher, and the social studies teacher helped create the curriculum and support the students. This required regular communication and meetings among the three teachers and me. I attended the planning meetings and helped the teachers integrate the curriculum and ideas.
Throughout the project students integrated the three subject areas during the learning experience. Students found it necessary to use information from science to support policy decisions. Throughout all of this, effective writing skills were essential. Consequently the English teacher had to have a hand in all areas of the project. Throughout the project, it became clear to the students that they had to rely on a number of disciplines to build a case for their positions. This was a valuable lesson for students who traditionally learn about disciplines in isolation.

**Element 4: Learning is based on collaboration and its facilitation of the social distribution of thinking.**

The collaboration for this project took place on many levels. On one level the collaboration between the students and the people involved in developing policy about Waldo Lake was an essential part of the project. This collaboration happened in different ways. The students were required to email the people who would be able to provide information about the issues and positions related to managing the Waldo Lake Wilderness Area. The list included members of the U.S. Forest Service who served as experts in areas of science and forest management. In addition students were provided with the email addresses of members of organizations that stand in opposition to the management decisions of the U.S. Forest Service. I felt that it was essential to have students communicate with groups who had different views on how to manage the area. This forced the students so consider the rationale and the value systems associated with each position.

As a result of the communications and collaboration, thinking happened in a variety of social situations. It didn’t just happen in the students’ minds after they read some information. Their thinking was continually evolving as a result of ongoing discussion and the consideration of different view points.

**Element 5: Learning uses technological tools for design, communication, and information retrieval.**

The project required students to use a number of technology tools. In fact, the teachers involved in the project stated that this project had technology infused usefully at the design, communication, and information retrieval levels. Students learned to use two basic design tools. To start the project, the students learned to use Dreamweaver 4, a web authoring tool to design their final project web site. I taught three web design classes for the students. During these sessions the students learned how to design, organize, and create a web site. In addition, they were required to FTP their sites to the school server which allowed them to work on their project from any location at any time.

In addition to the web authoring tool, students also used a mind mapping software program called Inspiration that helped them to create digital semantic networks. These students used these networks in a number of ways. Some students used the concept maps to organize and plan their speeches, essays, and web sites. While others made maps to simply organize the information before it became a part of a final assignment. All of these networks reflected the organization of their knowledge at a given point.
To support the discourse community, the students learned to use two communication tools for the project. To start the project, students set up email accounts and learned how to use their email so they would be able to initiate contact with the people who would be able to answer their research questions. Students also used a bulletin board to post, read, and respond to messages. The technology support people at the high school supported both efforts. In my initial design of the project in May, 2001, I planned on using synchronous communication devices in addition to email and bulletin board communication. When the school year started in September 2001, I found that the students (incoming freshmen) had little or no experience using email, and no experience with any synchronous communication devices. In addition, when I visited the expert participants at their various organizations, they had little or no experience or technical capacity for synchronous communication. At that point it became clear that we would rely on email and the bulletin board as our primary means of electronic communication. To retrieve information students accessed a number of web sites that contained a wide variety of information about the Waldo Lake Wilderness Area.

**Procedure and My Role:**

Because this fellowship funded my work on this project, I would like to describe the procedure I developed for the project along with the roles I played in creating and supporting the project. To facilitate knowledge networking and operate consistently within the five elements I outlined previously, the teachers and I designed the following unit for the students involved in the integrated liberal arts learning community. The learning community at Churchill High School consisted of 90 high school freshmen enrolled in a science, English, and social studies class. The teachers described the academic skills of the students as average to below average. The students investigated how personal values effect the management policies in the Waldo Lake Wilderness Area in the context of a project called Sacred Places. The students were given six weeks to complete the project.

To begin the project, I taught the students the technology skills they would need to complete the project. First they learned how to use Dreamweaver 4, a web site authoring tool. Then they learned how to use email and the bulletin board that the school set up. The technology support people at the high school helped me in the lab during all of the instruction. After the students learned the technology skills, I created and presented a PowerPoint slide show that introduced them to the major issues that face people who manage the area. The description of the project that the students received follows:

**The Assignment:**

**Description:** As human beings we are faced with a multitude of stressors and deadlines. Often it is helpful to escape the stress of everyday life by retreating to a special place. As individuals, undoubtedly there is a place where we all feel safe and are able to relax. As Oregonians, we have many such places of sacred solitude and natural beauty. In this project you will explore one of Oregon’s treasures, Waldo Lake Wilderness Area as well as describe and defend your own sacred place.
Project Components:

1. **Web Site.** You and your partner will develop a web site to present the information you have gathered. The purpose of your site is to inform the public about Waldo Lake by a thorough exploration of the following guiding questions:

   **Question 1:** Why is Waldo Lake sacred to so many Oregonians (humans and animals) and what values underlie this?  
   *Your answer* should thoroughly address the history, physical characteristics, recreational uses, dominant species (plant and animal, aquatic terrestrial), location, weather.

   **Question 2:** What is threatening this sacred place?  
   *Your Answer* should include substantial information concerning:
   - Development-buildings, roads, housing developments
   - Impacted Habitat-plants and animals
   - Natural vs. Manmade disasters- i.e. fires
   - Recreational Use-guide services, motor boats, snowmobile use.

   **Question 3:** Should we work to preserve the pristine quality of Waldo Lake or should compromises be made to satisfy all of the major stakeholders?  
   *Your Answer* should be supported with substantial information from your research.

2. **A Map:** You and your partner will create a scale version of a map of the Waldo Lake Wilderness Area.

3. **Persuasive Essay:** Your partner and you will challenge each other to defend your individual sacred places when challenges are made to change the condition of your place. Given the challenge your partner has proposed to the purity of your sacred place, write a persuasive essay in which you completely defend your sacred place.

4. **Persuasive Speech:** Transform your written work into a persuasive speech in which you convince your classmates of the importance of your sacred place.

Using the theme of sacred places allowed the teachers and I to have the students investigate the role of values in decision making through a theme.

**My Role:**

My role can be divided into two areas. The first area involved contacting the experts who help develop the policies for managing The Waldo Lake Wilderness Area. The second area involved finding and organizing the electronic and hard copy materials the students would use.

First, I contacted the U.S. Forest Service personnel and other people and organizations involved in developing the policy for managing The Waldo Lake Wilderness Area. I made my initial contacts by phone. In my phone conversations I explained the project and asked them if they
would be interested in communicating with the students who would be emailing them initially with questions. All the people I contacted agreed—with varying degrees of enthusiasm—to participate. After my initial phone conversations almost all of my subsequent communication took place by email.

After I made the contacts and created an email contact list for the students, I gathered and organized the hard copy and electronic resources for the students to use. The hard copy resources consisted of maps and brochures from the U.S. Forest Service. The brochures described the essential elements of the area and provided an introduction for the students before they visited the web sites they used as resources for the project. The electronic resources consisted of web sites I found, described, and organized for the students. The two major sites the students used provided different viewpoints on how to manage the area. The U.S. Forest Service site (1) had sufficient information describing how and why the Forest Service was trying to balance the use requests of the public with preservation of the area. The Waldo Lake Wilderness Council site (2), on the other hand, took a position that favored the preservation of the area and gave little consideration the expansion of any further use. In fact, The Waldo Lake Wilderness Council has called for increasing the area around Waldo Lake that would be designated wilderness area, thus restricting access and development.

The fellowship funding I received essentially allowed me to carry out a very practical project that took shape through the participation of over 100 people. The drive to carry out such a project was fueled by my experience as a teacher and now as a college professor. Both of these experiences have provided me with perspectives about the doing research in dynamic environments.

As we educational researchers break out of old research models and move into the area of project creation and evaluation, we find ourselves in dynamic environments (schools) that evolve as we work in them; we engage in action research. Consequently, as researchers the dynamic and evolving culture of school requires us to adjust and adapt. We can create a plan using the knowledge we have and then, after operating in that environment, the content and process of you’re the project changes, the project itself evolves and certain elements we may have never considered become relevant and valuable.

I saw my primary role in this project as a community creator. A large part of my time was spent contact and facilitating connections. I felt it was necessary to start the communications in person. Mostly because it was important for me to be able to describe my reasons for making the connections and requesting the voluntary participation of people involved in developing the management policy of Waldo Lake. Thus, this form of synchronous communication needed to happen via the telephone. Now, in the future the voice communication may in fact happen over the internet (or internet two) or over wireless communication networks. As the technology exists today, the communication networks are divided and we make distinctions. The pragmatic nature of my situation required me to be able to respond to questions and explain the project. The most efficient way for me to accomplish this was by phone.
Questions and Answers:
Lastly, I would like to discuss the project in the context of the guiding research questions I developed in my proposal. These questions guided the project:

How can electronic communication environments be used to promote knowledge networking?
From my experience on the project electronic communication environments can promote knowledge networking in a number of ways. The first way is to use the electronic communication environments in a very structured way that is driven by structured learning activities. I’m beginning to believe that this is a basic rule for using technology in any thoughtful way. Educators use technology in a way that supports the needs of the learning activities. Secondly, it’s important to begin with highly structured activities. Schools operate on time schedules with a number of people relying on scheduling and structure. So, until schedules become more flexible this will continue to be a challenge. Students can be given work to do outside their classes that would be considered discovery learning.

Another characteristic that made this an effective knowledge networking environment was the use of experts in the community. I’m convinced this element elevated the level of professionalism among the students. The students comments reflected this. The teachers observed the students discussing how careful they had to be with language when they communicated with the experts. They felt that serious questions would warrant serious response. Because of this, the experts were also able to interpret students questions and scale their answers in a way the students could understand. This makes information gathering fundamentally different when you compare it to students simply mining the web for information. When students encounter static information it may be well beyond their reading or knowledge level and in this case they might completely ignore the information or misinterpret it. In this project the students always had access to an expert who would be able to help the student develop understanding, a cognitive apprenticeship in a situated learning environment.

How does knowledge networking in electronic communication environments contribute to the understanding of different values related to land and water management in the Waldo Lake Wilderness Area?
According to the teachers and students, the unique process contributed greatly to their understanding. The I asked the students was: How was this learning process different from your standard learning experience that didn’t involve an electronic community and primary source material? The majority of my responses supported my assertion that this was a fundamentally different learning experience. Students described this as a “real life” experience and considered it an authentic learning experience. In the age of the Internet, students are going to demand more authentic learning experiences as they become available to them. They are gaining access to communities and information that will lead them to question educators who refuse to leave the walls of the school either physically or virtually. I believe that a combination of electronic communities and virtual environments will lead the way for changes in the future.
Students stated that their involvement in the process helped them understand the complexity of the decision making process in land management policy. Early in the project students saw the variety of positions and wondered how it was possible to reach agreement when different parties disagreed from the beginning. The teachers saw this as a powerful opportunity to teach the students about the values that underlie the positions as well and the process of communication and compromise. Students saw the process as slow and cumbersome but they also understood that this was a process that we had to adhere to. Students also said they couldn’t have imagined doing this without electronic communication tools.

The students also stated that authentic nature of the communication in the knowledge networking process allowed them to hear the voices of the people who responded. The students made many comments about the type of language the experts used and how the voices of the experts helped them understand the positions and read beyond the actual text of the communication.

According to the teachers and students, the unique process contributed greatly to their understanding. The fundamental question the students answered was: How was this learning process different from your standard learning experience that didn’t use involve an electronic community and primary source material? They had a variety of responses that supported their assertion that this was a fundamentally different learning experience. One of the common responses was that it was a “real life” experience. Students seem to gravitate toward authentic learning experiences. As I discussed earlier, the authentic nature of projects has a powerful effect on students. In the age of the Internet, students are going to demand more authentic learning experiences as they become available to them. I believe that a combination of electronic communities and virtual environments will lead the way for changes in learning environments in the future.

Students also stated that their involvement in the process helped them understand the complexity of the decision making process in land management policy. Early in the project students saw the variety of positions and wondered how it was possible to reach agreement when different parties disagreed from the beginning. The teachers saw this as a wonderful opportunity to teach the students about the values that underlie the positions as well and the process of communication and compromise. Students saw the process as slow and cumbersome but the only way to do it. After they finished the project, students couldn’t imagine doing this without electronic communication tools.

The students also stated that authentic nature of the communication allowed them to hear the voices of the people who responded. The students made numerous comments about the type of language the experts used and how their voices helped them understand the positions and read beyond the actual text of the communication.

How do electronic communication environments effect the content of discourse and the willingness of participants to participate in discourse?
Both the students and the experts agreed that the content of the discourse was enhanced by the process. The experts considered the students questions to be well formed and designed to get at the core of the issues. They seemed to be an honest reflection of their state of understanding at the moment. Some experts stated that after they provided the students with answers to their questions they would ask the student to explain what they had just learned. I expected the students would be able to get answers to the basic knowledge questions from the web and other sources. The goal of establishing the electronic community was to have the experts answer the higher-level questions. This is what made the project fundamentally different from a standard curriculum.

The other element involved the willingness of participants to engage in an electronic community. The students were required to, so their willingness to participate was measured by their interest and resistance. When we asked the students how their willingness to participate evolved during the project, the majority of the students said their desire to participate increased because they were establishing relationships with the experts along with getting the information they sought.

The experts were willing to participate because they were able to communicate their positions with students who were young and willing to learn. So, some saw this as an effective way to carry out a civic duty as well as a way to educate the public in a way that might provide more protection for the area. The majority of the experts said that their willingness to participate increased as the project moved forward.

Both the students and the experts agreed that the content of the discourse was enhanced by the process. The experts considered the students questions to be well formed and designed to get at the core of the issues. This was a goal of the project. We knew the students would be able to get answers to the basic knowledge questions from the web and other sources. The goal of establishing the electronic community was to have the experts answer the higher-level questions. This is what made the project fundamentally different from a standard curriculum.

The other element involved the willingness of participants to engage in an electronic community. The students were required to, so their willingness to participate was measured by their progress throughout the program. When we asked the students how their willingness to participate evolved during the project, the majority of the students said their desire to participate increased because they were establishing relationships with the experts as well as getting the information they wanted.

The experts were willing to participate because they were able to communicate their positions with students who were young and willing to learn. So, some saw this as an effective way to carry out a civic duty as well as protect the area. The majority of the experts said that their willingness to participate increased as the project moved forward. The increase in participation occurred mostly because the students level of knowledge was developing so their questions were developing as well.

Conclusion:
This project was made possible because of the willingness of people to be a part of a community. As I stated earlier, this project involved well over 100 people who contributed their time and attention. I would like to thank all of them along with all the members of the Berglund Center for Internet Studies. Our communities and schools, the souls of our cultures, will increasingly be interacting in electronic communities and increasingly over the internet. As a result, we need to continue to create and evaluate ways we can develop and support quality learning experiences that link together members of the community and students. We can evaluate the positive effects of our project right now, but the most powerful effects the students and experts might have on our communities may be yet to be seen.

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Dr. Mark Szymanski can be reached at marks@pacificu.edu.

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ONE THOUGHT ON “KNOWLEDGE NETWORKING IN ELECTRONIC ENVIRONMENTS: A VALUES INQUIRY PROJECT”

http://nrrn.com/

on January 30, 2014 at 11:16 PM said:
Now, the stadiums are all set as well as there are some which on becoming labored for beating the deadline as the some days left to start of the match In addition to it, the sponsorships as properly as the Tv broadcasting discounts acquiring signed and finalized. The Brazil world cup is offered at the reside up as well as it has the hoopla created. Besides it, 1st period of income available to the next year event that would operate till October ten. Generally, the three.three million tickets would be produced obtainable for the general public for purchasing to the distinct matches.

Up coming they defeated Belgium 20, in the most challenging match for Brazil in the tournament Towards England in the quarter finals, Brazil won 21. Ronaldinho scored the winner with a remarkable lofted free kick and also assisted teammate Rivaldo for their initial purpose, but was despatched off for stamping on the right ankle of England’s Danny Mills. The semifinal was in opposition to Turkey, which Brazil experienced faced in their team. Yet again, this match was challenging, as Brazil gained 10 with a goal by Ronaldo. Rivaldo experienced scored a single objective every in all five match up to this one but did not manage to strike the focus on in the sixth.