DOCUMENT RESUME

ED 413 143 RC 021 242

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TITLE	The Rural Learning Network: A Teaching and Learning Collaborative.
PUB DATE	1997-09-00
NOTE	15p.; In: The Many Faces of Rural Education. Proceedings of the Annual NREA Convention (89th, Tucson, AZ, September 24-27, 1997); see RC 021 239.
PUB TYPE	Reports - Evaluative (142) -- Speeches/Meeting Papers (150)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*College School Cooperation; Computer Mediated Communication; *Computer Networks; *Computer Uses In Education; Cooperative Programs; *Educational Resources; Elementary Secondary Education; Geographic Isolation; Higher Education; Pilot Projects; Preservice Teacher Education; Professional Isolation; Rural Education; *Rural Schools
IDENTIFIERS	*Teacher Networks; *Technology Utilization; University of California Davis

ABSTRACT

This report examines the feasibility of a Rural Learning Network (RLN) using technology to connect rural California schools to educational resources at the University of California at Davis (UCD). Teachers from five rural schools agreed to participate in the pilot project for 2 years, during which time they would participate in on-line conversations, share student work, and conduct individual teacher research projects focusing on classroom use of technology. University participants agreed to connect preservice teachers to students through electronic mail; offer staff training; provide support for teachers in issues related to teaching, curriculum, and environmental studies; link preservice and inservice teachers for collaboration on curriculum development; and organize yearly meetings of participants. During the first year of the project, the five rural schools and UCD were connected electronically for electronic mail and schools were equipped with Internet access. In addition, UCD staff provided training at each site on the use of electronic mail and the Internet. During this time, interdisciplinary teams of preservice teachers communicated with teachers at the partner sites and developed lessons that integrated science and language arts. During the second year, analysis of the number of electronic communications indicated that all sites did not participate equally. In two cases, there was very little communication between the schools and UCD other than brief messages at the beginning of the year. Analysis of messages revealed that most sites participated in response to specific questions asked by the listserv manager, and that social messages represented about one third of all messages exchanged. Interviews revealed that student teachers lacked the time or access opportunities for active participation. By the end of the second year, no participants had shared student work on the RLN. However, teachers and technology specialists at three sites were conducting teacher research projects regarding the use of technology in the classroom. This report concludes by offering proposals for increasing the use of RLN and addresses strategies to improve the efficacy of RLN to teachers. (LP)

The Rural Learning Network: A Teaching and Learning Collaborative

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ED 413 143

National Rural Education Association Conference

September 27, 1997

Tucson, Arizona

As the acquisition of technology tools becomes more common place among all schools, it is time to create opportunities for the technologies to mature into quality tools for instruction and learning. Teachers and students in rural schools often do not have the human or financial resources to avail themselves of all that technology has to offer. In a collaborative effort, five schools ranging from the foothills of the Sierras to the farmlands of California's Central Valley have joined together in conjunction with UCD to study the creation of a Rural Learning Network. This network could offer email communications possibilities between teachers who may share common interests, work group links between classrooms at similar grade levels, curriculum development opportunities between inservice and preservice teachers, access to on-line libraries and educational resources, a gateway to the Internet, and a support system for extending the educational horizons of rural teachers and students who are often isolated because of geography. Geographical distances and boundaries all but disappear as teachers and students make friends and colleagues while building educational bridges across the miles.

History

In the Spring of 1994, supported by grants from Apple Computer, Inc. The University of California, Davis (UCD) , Camptonville Union Elementary School District (CUES), and Yolo County Court and Community Schools (YCCCS) entered into a partnership to integrate the use of computer based technology in a study of environmental issues in the Sierra Nevada foothills and the Cache Creek Drainage. These projects attempted to connect students from small rural or isolated schools with student teachers and faculty at UCD. Under the original grants, Apple ® supplied hardware, software, and the

extensive staff training required to integrate the use of computer based technology in student centered learning to the teachers at CUES and YCCCS.

Upon completion of the Apple grant projects, it was obvious that developing better electronic communications was a key to facilitating continued collaboration amongst isolated rural schools and UCD. As a result of this finding, the goal of the partnership shifted from environmental studies to the development of a dedicated network amongst teachers and students in these isolated schools.

Many of the teachers involved in these initial projects identified professional isolation as a significant draw back to their successful use of technology in the curriculum and to an understanding of how others dealt with everyday educational issues in general Many felt that they lacked opportunities to communicate with peers, chances to offer and receive collegial support, and opportunities to share and compare the work of their students with others at the same grade level. What was lacking was the type of communication that occurs in a faculty room or lounge. Teachers also expressed a concern about the social isolation of their students who often had lived their entire lives without exposure to children and or adults from outside their communities. From these initial concerns, the idea of the Rural Learning Network, functioning as a virtual faculty room, arose.

Purpose

The goal of the Rural Learning Network (RLN) was to provide a virtual community for teachers and students from isolated communities where ideas could be exchanged and collaboration could flourish. In addition, an opportunity for preservice teachers to experience the unique educational environment of small rural schools was an option lacking in the existing credential program. Developing a virtual community amongst students, teachers, university faculty and preservice teachers would serve as a way to discuss and explore many educational issues.

Initially funded under a planning grant from the Cooperative Research and Extension Services for Schools (CRESS) Center, the goals for the RLN were:

- Provide a method for teachers, students, university faculty and preservice teachers to collaborate through electronic communication.
- Provide a method for teachers to share student work through on-line resources.
- Introduce preservice teachers to the rich depth of curriculum integration and teaching techniques in use at rural schools.
- Provide teachers in isolated schools an opportunity to conduct action research on the use of technology in their own classrooms.

After completing the planning phase of the grant, a CRESS implementation grant was obtained to provide two year funding to implement the RLN. Funds were used to

- Employ a list manager to maintain email lists, update addresses, archive messages, and initial conversations amongst participants by posting regular questions or ideas.
- Support travel to the various sites to provide staff training and hardware support
- provide substitute teacher release time and travel expenses for annual participant meetings in the Spring
- Off set copy costs and to support teacher's action research projects.

Participants

Participating teachers were initially drawn from the two schools which had participated in the Apple grants. In addition, two schools from the rural central valley and a second school from the Sierra Foothills were invited to participate. The additional schools either had a previous association with UC Davis through research projects, had served as sites for preservice teacher placements, were schools where teachers had been members of the initial grants but had changed teaching locations, or schools with new teachers who had previously been part of the Apple grants projects while enrolled in the UC Davis credential program.

Teachers at each site initially agreed to participate in the project for a period of two years during which time they would participate in on line conversations, share student

work, and conduct individual teacher research projects about their use of technology in the classroom. The university participants agreed to connect preservice teachers to students through electronic mail much like pen pals, offer staff training where needed, provide content support for teachers on issues related to teaching, curriculum, and environmental studies, link preservice teachers to inservice teachers for collaboration on curriculum development, and organize yearly meetings where all participants could meet face to face to discuss their progress. A summary of the participating schools is shown in the chart below. Each site was unique in its access to electronic communications, access to hardware, levels of teacher training, and environmental setting.

School	Location	Grades	Participants	Technology Resources
Camptonville Elementary (CUES)	Sierra Foothills	5-8	40 students 3 teachers 1 tech specialist	6-8 computers per classroom provided by Apple Grant
Cache Creek High School (CCHS)	Rural Central Valley	9-12	20 students 1 teacher	6-8 computers per classroom provided by Apple Grant
Waggoner Elementary School (WES)	Rural Central Valley	5	150 students 5 teachers	No computers in classrooms, no access at school
Winters Middle School (WMS)	Rural Central Valley	7-8	150 students 1 teacher	One computer per classroom, new teacher trained at UCD
Yuba Feather School (YFS)	Sierra Foothills	8	30 students 1 teacher 1 administrator	10-12 Computers per room for participating teacher. No training
UC Davis Division of Education (UCD)	Central Valley	Preservice Teachers and Education Faculty	16 preservice 3 faculty	Each participant had regular access to computers either at home or at school. Training in methods classes

Activities

Year 1- Planning 1995-1996

1. Planning meeting held at the university campus as well as at each participant site to plan for and develop a framework for the RLN. (March 1996)

2. Training in electronic communications, software utilization, and hardware solutions was provided for all school sites by university participants. (March 1996-June 1996)

3. Preservice teachers from UCD traveled to the remote sites to meet students and teachers, discuss curriculum directions. (Winter 1996)

4. Working in cross disciplinary teams, preservice teachers from Language Arts and Science collaborated with rural teachers to create integrated multi media lessons applicable to the teacher's curriculum. (January 1996-June 1996)

5. Hardware was loaned and installed at the rural sites if needed to facilitate communications. (January 1996-June 1997)

Year 2- Implementation 1996-1997

1. Grant funded by CRESS for a two year project

2. Initial meeting with all participants to plan activities, establish communications expectations, facilitate hardware solutions, and train staff in communications techniques. (September 1996)

3. Creation of ListServe for all participants. (September 1996 -October 1996)

4. Regular electronic messages were posted to the list by list manager (September 1996-April 1997)

   a. Biographies submitted by all participants

   b. Topical Questions

   c. Teacher requests for assistance or support

   d. Referrals or requests from participants

5. Site teachers conducted action research on their use of technology. (January 1997-June 1997)

6. Continued email between students and preservice teachers.

7. High Speed access (ISDN) communications installed in each foothill school. (January 1997 -March 1997)

8. Spring meeting with all RLN participants. (March 1997)

Results

Year One- Planning

As a result of the work done in the planning grant, each of the five partner schools and UCD were connected electronically for email and sharing of student work. In addition, each site established, at a minimum, modem access to Internet resources. During the first year, UCD staff provided training on email and Internet for interested teachers at each site. Inter disciplinary teams of preservice teachers communicated with teachers at the partner sites and developed lessons related to the grade level curriculum topics which integrated science and language arts. Planning for these projects was initiated by site visits bringing together the students and inservice teachers with the preservice teachers. During the visits, preservice teachers became aware of the curriculum topics to be covered by the lessons and the level of student work. It was anticipated that email during the year would allow the inservice and preservice teachers to collaborate on the development of these lessons. This email communication was difficult to accomplish and eventually the preservice teachers completed the lessons without additional communication from the teachers. As an off shoot of the RLN, the Fifth grade teachers at Waggoner Elementary School develop their own electronic network to facilitate their work with students. Using this small school wide network, teachers at Waggoner communicated readily with each other posting a large number of messages to their list serve.

Year Two-Implementation

Results for year two focus on the four major goals of the RLN project.

1. Lines of electronic communications were established initially between all partner sites. Analysis of the numbers of postings shows that all sites did not participate equally. In two cases, CCHS and WMS, very little communication took place other than brief messages at the start of the year in response to the list serve

managers' request for biographies of all participants. Three partner schools and UCD did continue to have varied levels of communications. Waggoner Elementary School (WES) posted the largest number of messages (94) followed by Camptonville (39) and Yuba Feather School (20). Some student teachers participated but year end interviews revealed that most student teachers lacked the time or access opportunities that were initially anticipated for their participation. Of the 16 preservice teachers involved in the UCD program only 4 actually exchanged messages. These were the only messages exchanged between rural students and the University.

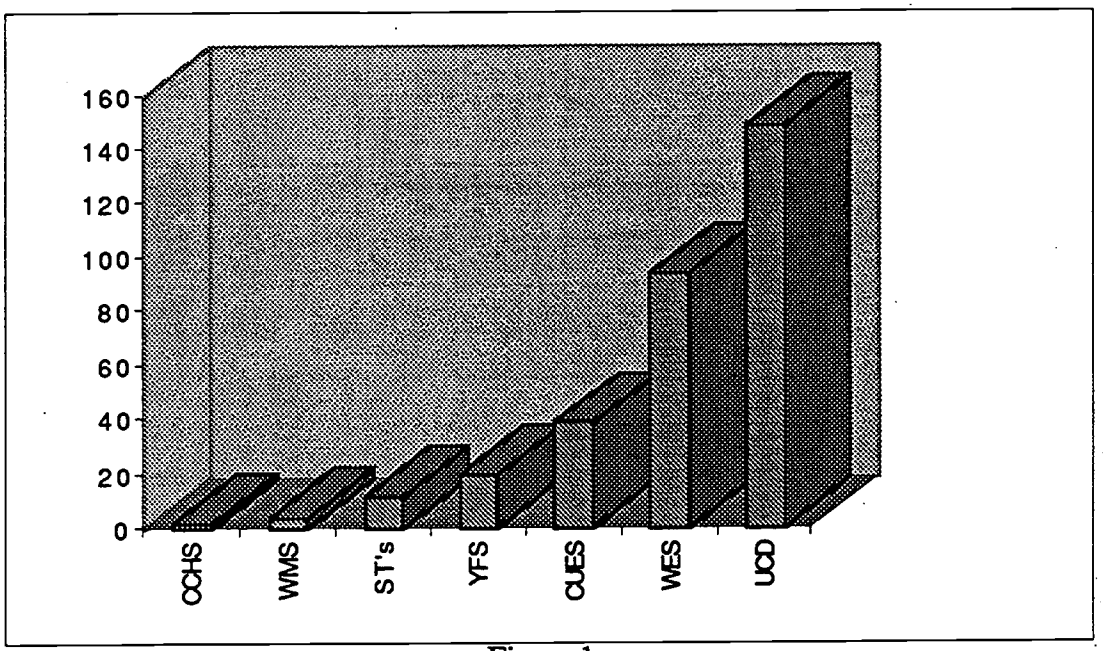

Figure 1

Analysis of the messages reveals that most sites participated in response to specific questions asked by the list serve manager or other events The evidence for this is revealed in the data which shows all sites participating in September in response to the start up messages and requests for biographical information about the participants. In addition, there is an overall increase in participation in March in response to issues raised at the Spring meeting. In addition, graphical analysis reveals posting activity from the preservice teachers and CUES teachers in

November after questions from YFS in October. WES then responded to those postings in January.

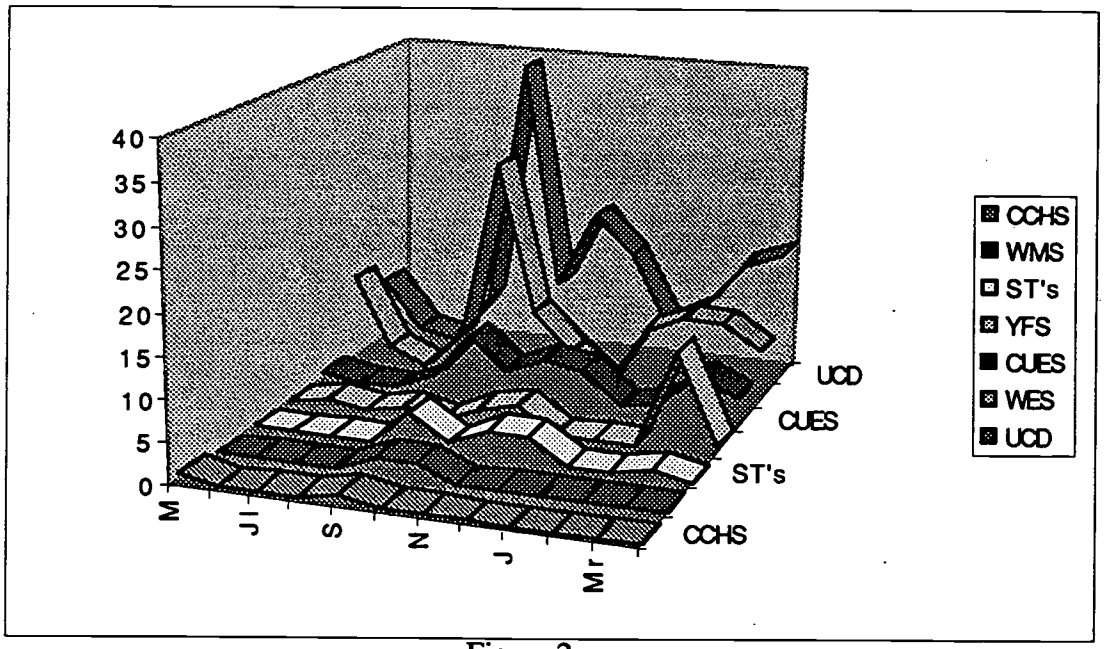

Figure 2

Additional analysis of the types of messages sent indicates that Social (biographical responses, conversations about likes and dislikes and casual responses to comments) represented about one third of all the messages exchanged however informational postings (requests for assistance, response to requests, referrals to Internet sites, and how to information) represented one half of all the postings and administrative messages (requests for biographies, notices about system status and infrastructure messages) were only about one sixth of the postings. (Figure 3)

Further analysis of the types of postings by month reveals that social messages were at their most frequent in September and then trailed off until the end of year two whereas informational postings showed a continuous rise from December to April. (Figure 4)

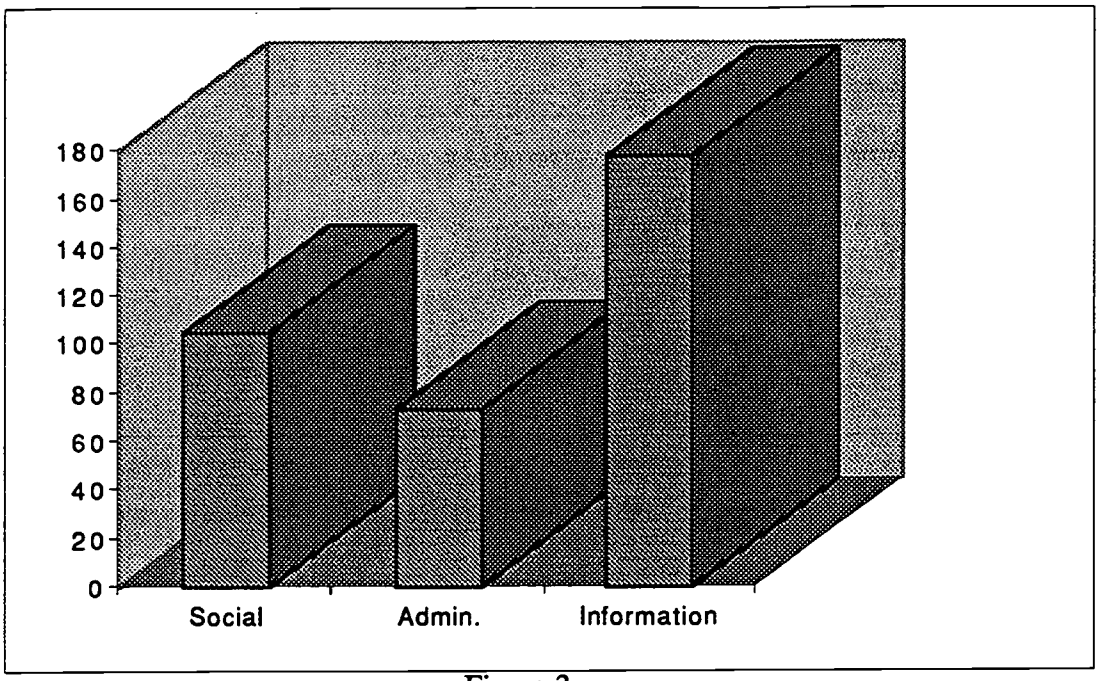

Figure 3

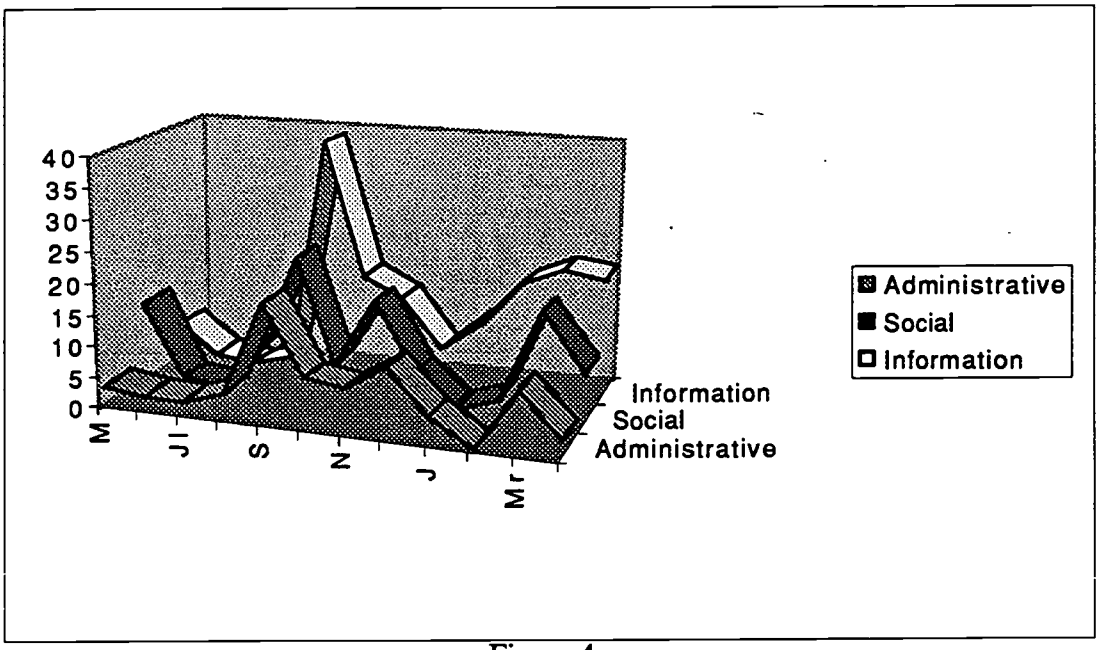

Figure 4

2. By the end of year two, no participants had shared student work on the RLN.

3. During the planning year, preservice teachers made multiple attempts to contact and collaborate with inservice teachers at the rural sites with poor results. In exit interviews at the end of year one, preservice teachers unanimously commented that they had made multiple efforts to contact teachers with very poor results. Without the types of collaboration that were anticipated, preservice teachers continued to work on their integrated curriculum projects but without the inservice teachers input. During year two, the nature of the anticipated interaction between the preservice teachers and inservice teachers changed to a more collegial and mentoring format. Preservice teachers were encouraged to submit resource, how to , and curriculum questions to the RLN as well as to the university supervisor with the hope that inservice teachers would share their experiences. This type of interaction occurred in every case. A review of the messages sent by preservice teachers and responded to showed approximately 3 response per request, usually from a variety of sites and or teachers. No record was kept of individual responses preservice teachers received which did not go through the RLN List serve.

4. Teachers and technology specialists at three sites conducted teacher research projects. One project consisted of a journal about teaching staff to use technology in the classroom. Review of the journal is ongoing with completion expected during year 3 or the project. Another teacher had students document their use of Internet resources including time spent searching vs. time spent utilizing found resources, attitudes about use of technology for school projects and reflections on the value of the electronic resources for each project. The third project documented the creation of a school local area network (LAN) and how it impacted student technology use. This is a two year project and should be completed in year three.

Year Three-Proposed

Based on the findings of Year two, several proposals have been made to increase the use of the RLN and to utilize it's unique resources.

1. A new technology grant is sought by a consortium of year two schools plus two new schools. The two new schools added to the RLN represent schools where previous year two participants are now teaching or which are rural and share commonalties with previous participants. The new grant proposal draws on the experience gained from both the Apple Grants and the RLN grants in linking students from remote rural sites in a study of common issues in California. Students will use the RLN for communications while studying similar questions in a variety of regions throughout California. Students will share data via a Web Page data base and will prepare mitigation proposals based on their research. Students will create web pages sharing their findings with students world wide. Through the use of email, students will access experts in the various fields pertaining to their research

2. Each school will work to obtain hardware resources which will allow sharing of non electronic student work. In addition, teachers will be trained in use of email for transferring data. Through the use of the RLN, teachers will share reflections on student work in an effort to decrease the isolation experienced by many rural school teachers.

3. Teachers will continue action research to investigate issues about their use of technology in teaching and learning.

Discussion

Based on the reported results, there arise four questions, the answers to which could server to improve the efficacy of the RLN and its use to teachers.

Question 1

What dictates peoples participation in a dedicated communication network? Is it time, interest, technology skills, access, availability of hardware? Based on the results from year two (the first year where communications use was actually plotted), quantity or quality of equipment cannot be the limiting factor nor can access. CUES with 6-8 computers per classroom, with dedicated phone lines (and ISDN during year 2) was one of the lower participants (39 postings) considering that three teachers and one technology specialist began the project with only the technology specialist participating. WES with no computers in the classrooms and no school network access was the highest school participant (94). In this case, teachers used their home computers and their personal accounts to communicate with the RLN. Could the issue be training? Again the results show that the schools and or individuals who received the greatest amount of training on the use of electronic communications and or computer use, Camptonville teachers and preservice teachers were the lowest users of the RLN over the period of one year while WES with no training sent the most messages. Despite the obvious differences in available hardware, software, training, and access.

Question 2

What events precipitate a persons' involvement? There were 105 social postings, and 178 informational postings. It appears that teachers used the RLN primarily for two reasons. The greatest usage, informational, offered isolated teachers an opportunity to seek advice, referral, and assistance from a much large group of peers. It is obvious that the casual and or social interactions were important to developing the community of the RLN.

Informational postings did not begin at the outset of year two. Instead, social postings were prevalent in the initial months until people became comfortable with the other members of the list. Once this comfort was established, social use diminished as the primary use and informational postings increased. Social postings did remain an significant portion of the postings throughout the second year of the project.

Question 3

Why did the middle school and high school participants drop out? Each had students or issues that were similar to the other schools, each had ample training, available software, and free access both at home and in the classroom. A review of the nature of the messages indicates that little emphasis on grade specificity existed. Requests for information or assistance were applicable to the types of lessons and interests of both participants and were appropriate for students at each site. Follow-up interviews during year three will be conducted to determine what other factors influenced use of the RLN.

Question 4

What adjustments need to be made to respond to participants desires to share student work. Stated as a common goal for the RLN by teachers during the planning phases of the project, what prevented teachers from utilizing this aspect of the list. If possible, additional hardware will be obtained to ensure ease of use of the list for this purpose.

Summary

Creating a virtual community of people who are accustomed to working in rural isolation takes time. Evidence from year two of the RLN indicates that teachers can and will use a dedicated communications network to enhance their teaching, student learning. However, it appears that teacher use is much like teacher participation in other types of

forums. Not all members of a group participate equally. In many cases, the majority of conversations occur between a few participants with others joining in only when an issue or topic holds specific meaning to them.

As with any new endeavor, it takes time, trust, and continuity to support and nurture these interactions. Interest from the teachers for the continuation of the RLN in year three is high. Participating preservice teachers from year two who are now employed in schools outside the RLN group have continued to post questions to the list, indicating that they value the virtual collaboration that the list provides and will continue to utilize this group as mentors at least until they develop new networks of support in their new locations. The expansion of the list to include new schools, a new cohort of preservice teachers and new students at the school will provide a continued and renewed forum for discussion of student learning and teaching strategies. The Rural Learning Network has proven to be the seed for other uses of technology in schools. The university will continue to offer technology support, maintain the list and the archives, and where ever possible provide training for teachers preservice and inservice in the use of technology in the curriculum.

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