COMPUTER MEDIATED COMMUNITIES OF PRACTICE:

THE STATE OF TEACHER COLLABORATION IN

ONE RURAL ALASKAN SCHOOL DISTRICT

By

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A

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Abstract

The Yukon-Koyukuk School District spans an area the size of Washington State, while serving just over 300 students. Administratively based in Fairbanks, Alaska, the district is comprised of nine rural schools along the Yukon, Koyukuk, and Tanana Rivers which are geographically isolated, and in some cases only accessible by plane or boat. This mixed-methods inquiry, which contains both survey and focus group components, investigates the current use of internet- and technology-based methods and practices for collaborative use by district teachers. Concepts about teacher isolation, and communities of practice provide the framework for this situated study. Both the self-reported skill-set elucidated by the survey and the actual picture of the technological situation at the various sites gathered from the focus group participants suggest that teachers would value an increase in collaboration, but need more training before that can effectively take place. The data help to inform a list of six specific recommendations to the district to address these needs.

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Introduction

For the purpose of this inquiry, I investigated the use of existing internet-based technologies (such as Skype, wikis, social networking devices, Moodle, etc.) by an Alaskan rural school district and its teachers for the purpose of teacher collaboration including education (professional development), mentoring, and curriculum management.

Through the use of an online survey, as well as a focus group administered via video-conference I looked at current use, dilemmas in that use, quality and frequency of use, possible roadblocks, and ways to expand current usage through teacher-driven development and increased administrative support. Furthermore, I wanted to find out if the current technology is being fully utilized to support the dissemination of relevant knowledge and the professional growth of teachers through computer-mediated communities of practice.

I rely heavily on ideas of communities of practice for the framework of this study, and the literature review is framed in that way, focusing on communities of practice themselves, methods of social practice, and intentionality and purpose. This framework describes technology as a social practice rather than something independent, an autonomous tool. Because of this, when we look to understand a specific community of practice, we must acknowledge its situated nature; how unique social interactions are modified by technology and how the technology and the members of the community are mutually constituted. In other words, just because a technology (or tool) exists, does not mean that all the members of a community use it in the same way, for similar reasons, or that it even acts in a supportive way to the community of practices itself.

After analyzing the data from first the focus group, then the survey, I put forth my findings in a set of six recommendations to the Yukon-Koyukuk School District with whom I partnered for this study. These recommendations can act as a strengths-based assessment, or they can follow my intended path which is to inform the district and provide a type of road map for future inquiry and planning.

Rationale

Spending time as an elementary teacher in rural Alaska exposed me to many things about education that were not covered in my pre-service coursework and practicum through Washington State University. Unfortunately, many rural or "bush" teachers have a similar experience. We become used to the supportive environments of our universities, and perhaps even the schools where we do our internship or student teaching, then are faced with the stark reality of professional isolation that comes with the smallness and remoteness of our teaching post (Johnson & Donaldson, 2007). This idea was further solidified for me while giving a presentation at the 2009 Alaska Society for Technology in Education conference focused on combating teacher isolation. The teachers and administrators in the audience all felt the same isolation, but none could quite articulate a way to counteract or prevent it.

Teaching, like many other professions, is one of constant personal growth. However, the process is typically facilitated by a mentoring or apprenticeship-type relationship, developed spontaneously and organically between newcomers and old-timers. Rural Alaska is not effectively set up for this face-to-face relationship building. According to Hur & Brush (2009), those teachers who seek out online collaboration do so for five reasons; a chance to share emotions, utilize the advantages of an online environment, combat teacher isolation, explore ideas, and to experience a sense of camaraderie. Online communication and communities of practice have the potential to transform the professional lives of many rural teachers, and for that possibility, I believe it deserves some attention.

Theoretical Framework

This study is grounded in the theories of social constructivism, but mainly in the ideas of Communities of Practice (henceforth CoP), situated learning and apprenticeship outlined by Lave and Wenger in *Situated Learning: Legitimate Peripheral Participation* (1991). A community of practice is defined as that which involves "…participation in an activity system about which participants have understandings concerning what they are doing and what it means in their lives and for their communities" (p. 98). These theories align with my own epistemological ideas and have therefore helped to formulate my study by providing an organizational construct with which to think about some of the problems facing rural teachers, namely that of isolation.

Although Lave and Wenger did not specifically center their ideas on computer-mediated, or on-line social environments, their work concerning behavior in a learning community is applicable and possibly integral to understanding and/or creating professional communities of practice for rural teachers.

The technological framework that best aligns with what I am doing is that put forward by Bruce and Hogan (1998), wherein they examine "…how prevailing ideologies construct the meaning of technologies in different situations" (p. 269). From this framework of evaluating technology in a 'situated' environment, I am able to critically assess current technological behaviors, culture, and infrastructure in a situated or positional manner.

Literature Review

Rural Alaska is a place where education and professional educators are put under many strains. Do computer-mediated CoP have the possibility to mitigate these circumstances? What are the ideas that we can take away from more traditional CoP? How can this concept be made to fit the uniqueness of our rural situation? How are computer-mediated CoP already being used in education, and to what purpose? What are the possible motivating factors for creating "online" CoP? If "[t]eacher isolation is the enemy of improvement," (Kanold, et al. 2008, p. 23), why aren't teachers and districts focusing on bringing people together in meaningful ways? What are the roadblocks to creating successful CoP? These questions, and their respective discussion or answers can be addressed by at least three areas of literature: communities of practice, methods of social practice, and intentionality and purpose.

Communities of Practice

Lave & Wenger (1991) suggest that "To become a full member of a community of practice requires access to a wide range of ongoing activity, old-timers and other members of the community; and to information, resources, and opportunities for participation" (p. 101). In rural Alaska, this means that for teachers to form or enter a CoP, some type of assistive technology is required. Face-to-face meetings are not always possible, or practical, and must be recreated in another space.

However, again according to Lave and Wenger (1991), "Invisibility of the mediating technologies is necessary for allowing focus on, and thus supporting the

visibility of, the subject matter. Conversely, visibility of the significance of the technology is necessary for allowing its unproblematic-invisible use" (p. 103). This requirement of easy technology is not only a problem for those designing the software, it is also a call for consideration of technological proficiency, quality of infrastructure, and perhaps even taking into account the cultural and language barriers between Alaska Native teachers and those who are imported from other areas. The need to recognize "significance" is also echoed in Bruce (2002) wherein he states: "Even the basic computer interface becomes a site for the maintenance of power" (p. 53). Therefore, creating an "unproblematic" system for use in rural Alaska is imperative or required for a functioning and successful CoP.

Methods of Social Practice

The literature suggests two methods for participants of CoP; the idea of peripheral learning as suggested by Lave & Wenger (1991), contrasts significantly with compulsory participation as cited by Gulati (2008) and Vavasseur & MacGregor (2008).

For Lave and Wenger, "Peripherality suggests that there are multiple, varied, more- or less- engaged and –inclusive ways of being located in the fields of participation defined by a community. Peripheral participation is about being located in the social world" (1991, pp. 35-36). The idea of peripherality suggests that learning can and does happen in silence (Gulati, 2008). This may have interesting outcomes when taken in the context of a small computer mediated CoP; while postings and discussions may appear

somewhat limited at times, with participants moving in and out from the 'center,' participating membership may actually be quite large.

On the opposite end of the spectrum is what could be considered forced participation. This may come in the form of coerced participation by superiors, or pressure from colleagues. Rather than increasing meaningful usage, enforced or coerced participation may actually decrease the quality of participation in terms of the depth of discussion and honesty on postings/interactions (Gulati, 2008).

Intentionality and Purpose

A Community of Practice happens when three characteristics are present; a shared commitment to an area of interest, relationships built in community activities, and the building of a shared practice (Wenger, 2006). It is "[b]y developing these three elements in parallel that one cultivates such a community" (Wenger, 2006).

Teacher knowledge sharing, collaboration, and mentoring are all valid, common CoP purposes. They share the theme of teacher interdependence and the building of self-efficacy. But, in order to "cultivate" a successful CoP as Wenger suggests, the purpose must meet the method, and several barriers need to be addressed (Ikpeze, 2007).

Hew and Hara (2007) suggest possible barriers to both the formal and informal sharing that occur in CoP as "selfish attempts to hoard knowledge" (p. 574), and also suggest that many teachers have negative attitudes toward the idea of a community of practice. In my experience, a teacher can sometimes form a part of their identity through their perceived 'specialness;' by sharing ideas, that individuality can be seen as being

taken away. Gulati (2008) also mentions teacher fears or thoughts of external control or surveillance as reasons not to fully participate in a computer mediated CoP. Along the same lines, Anderson (2002) warns that online teacher betterment activities should not become a part of teacher evaluation. These concerns voiced by teachers and documented by the above researchers suggest the idea of an "egg-crate structure" existing in schools, where each teacher is safe and secluded, alone in their classroom, mimicking the divided cardboard egg container (Johnson & Donaldson, 2007). This culture and lack of an interconnected structure is the opposite environment conducive to a successful CoP.

Computer mediated collaboration could work to improve student success and end the current culture of isolation (In Alaska, we are physically/geographically isolated, but some, seemingly through their own choices, choose to remain professionally isolated). Those that choose to remain isolated may be the victims of what Crow (2008) suggests as "poor intent and contrived collegiality" (p. 54), and should not be seen as the reasons that computer mediated CoP are sometimes not successful (Ikpeze, 2007). Failed communities have also occurred where there was no perceived need, and collegiality was not a teacher priority (Parr & Ward, 2006).

It is also important to remember that those who may have a desire to take part in on-line collaboration may not be trained in its use. As Mikulecky and Kirkley (1998, p. 316), point out, "without knowledge, the usefulness of capital investments such as machines and technologies is greatly reduced." These 'machines' and 'technologies' could easily refer to any number of mitigating technologies a contemporary teacher is expected to use, but for the purpose of this inquiry, we can take them to include things

such as collaborative software and basic Internet proficiencies, both accessed through personal computers. A lack of these skills could also be a significant roadblock to teacher adoption and successful use or development of a CoP, further compounded again by the teacher's isolation in a rural setting. On the other hand, as Berge et al. (2002) suggest, "Educators and trainers perceive fewer, or less intense, barriers in organizations that are more capable for delivering distance education" (p. 417). Since many rural school districts in Alaska use distance learning for their students, this may be transferable to teacher education itself.

The disappearance of technology itself, an idea outlined by Bruce and Hogan (1998), may also stand as a roadblock, wherein rural isolated teachers have fallen behind in their training while the district has fallen behind in providing them training and equipment. For the outside world it could be that "Technological tools become so embedded in the living process that their status as technology disappears" (Bruce and Hogan, 1998, p. 270). As new and emerging technologies become commonplace in mainstream teaching culture, those who are geographically isolated may have a greater tendency to 'lag behind' professionally and socially, this could be further compounded by the added cost of building infrastructure in remote locations. Bruce (2002) adds to this that social relations and technologies become mutually constituted "because technological artifacts are enmeshed in our activities and our connections to other people" (p. 55). Bromley (1997) also discusses this in terms of trying to separate the technical from the social. It is imperative that we keep these social factors in mind, when trying to assess any "extra" effects that may be furthered by isolation.

Ikpeze (2007) suggests that success hinges on relationships, and that they may need to first be fostered in a face-to-face way. The ENDAPT project, as outlined by Gareis & Nussbaum-Beach (2007), was highly successful in cultivating an online CoP. Including online asynchronous interaction and mentoring, the ENDAPT project linked newcomers—first year teachers, and old timers—seasoned veterans, in an asynchronous format. While this project is a good example of a successful CoP, it was intended and used as a supplement to face-to-face interaction. Therefore, it is not possible to know what amount of success should be attributed to the online component, and what portion is due to the face-to-face aspect.

What may need to occur in order to develop a more stand-alone CoP is what Lock (2006) suggests: the requirement of new pedagogical framework to foster trust and intimacy— to change perceptions of what collaboration looks like. This concept is also echoed by Hur and Brush (2009), in their call for the need for emotional sharing, and also the idea of a cultural makeover for our schools posited by Kanold et al. (2009). Vavasseur and MacGregor (2008) suggest that this new type of collaboration ("online" or computer mediated), could then, once relationships have been established, be used for extending content as well as a non-evaluative tool for use during curricular planning time.

One startlingly important piece is seemingly missing from the literature, documentation of the successful life spans of computer mediated CoPs. Little is available in terms of tracking an online community from origin, through development, and on to success. Most research is devoted to identifying already successful communities, such as those outlined by Crow (2008), and Gareis & Nussbaum-Beach (2007), or providing

descriptions of failed communities (Ikpeze 2007). Wenger, (2002) created a flow chart to serve as a guide to growing CoPs, but more research is needed to document their creation from the beginning.

Statement of Bias

As an "insider" to the problem of rural isolation, I put an emphasis on technologies that prevent such. My technological skills, and understanding of online environments, put me at a predisposition to think of possible solutions in those terms and contexts. This may have affected my research in that the questions I posed showed preference for technological answers, and did not offer the opportunity to pose other solutions.

As someone who attended a University with strong views toward social constructivism as the best way of accessing teaching and learning, I am also predisposed to favor those viewpoints. That being said, as covered in the literature review, social constructivism and communities of practice are seemingly a natural fit to the issue at hand. This may have affected the design and outcome of the research in that the design is centered on social interactions, and assumes that social groups are a favored and appropriate method of support for rural teachers.

It is also important to disclose that my husband was an employee of Yukon-Koyukuk School District during the time when I conducted my research, although he was not in a supervisory position and is no longer employed there. Through his work, I met several of the teachers who took part in this study. Since a primary focus of this research was to find ways in which the district can better support its teachers, neither the survey, focus group, nor results, are critical or evaluative of the teachers in terms of their classroom skills. Thus, I did not anticipate any issues with regard to this relationship.

Methods: Research Design, Data Collection, and Data Analysis

Research Design

This was a mixed-methods study, consisting of a short survey and focus group. The survey was conducted through the online website Surveymonkey.com. I based my survey on an instrument designed by the International Society for Technology in Education, a well-recognized leader in the field of educational technology for the last 30 years (www.iste.org). I pared it down so that the questions focused on technology use in two main areas, or dimensions: professional development, and teaching/learning/curriculum. I also changed the wording of the answer choices to better reflect the type of data I was looking for; the choices were designed to gauge ability but also attitude and offered participants the choice of "Not at all," "Minimally," "Confidently," and "Am able, but do not." The first part of the survey assessed self-described teacher attitudes and behaviors, while the second part assessed how teachers teach and approach technology with their students. By having the two data sets to contrast, I was able to get a better understanding of their skill-set, and was also able to contrast that with their willingness to transfer knowledge in one area of their professional lives to another.

The focus group, which was conducted in a completely technologically –mediated way, was based on a series of focus groups conducted by The University of Texas Information Technology Student Focus Groups (Robert et al., 2009). (Focus Group Protocol, see Appendix A). Again, I made several changes to ensure that it was

appropriate to the setting at Yukon-Koyukuk School District, and would act as a structure to allow for the most information sharing between myself and the participants.

My target population was rural Alaskan teachers; specifically, those employed by the Yukon-Koyukuk School District. These teachers were from the isolated rural sites of Allakaket, Ruby, Huslia, Kaltag, Nulato, Koyukuk, Minto, Manley Hot Springs, and Hughes. All of the sites are small and the teachers are expected to teach multiple subjects or grade levels.

According to Creswell (2009), mixed methods research " …is more than simply collecting and analyzing both kinds of data; it also involves the use of both approaches in tandem so that the overall strength of a study is greater than either qualitative or quantitative research" (p. 4). By having both a quantitative and qualitative aspect to my research, the data I gathered felt richer and had more meaning. The survey provided an impression of how district teachers as a whole felt about their own personal technology skills and desires, while the addition of a focus group allowed for a more in-depth discussion about teacher expectations, current usage of district technological infrastructure and was, more significantly, a way to find possible road-blocks to teacher technology usage for collaboration and curriculum management.

Data Collection

All district teachers were asked to complete the on-line survey, and then were asked to self-select for the focus group, allowing the possibility of some snowball-type sampling to improve numbers. Since the target population was geographically isolated,

correspondence soliciting participation in the survey and focus group primarily took place via email. Those who self-selected for the focus group were given a reminder email, as well as being contacted by the district technology liaison to set up the videoconference. The survey was piloted by 5 individuals from the target population to test for understandability, and to bring forward any issues that may have arisen from the wording of the survey itself. (Survey Instrument, see Appendix B). The survey was administered after IRB approval was granted, in November 2009.

The focus group was conducted with 4 participants and varied from customary or conventional procedures in that it was solely conducted via distance delivery, whereby I was in a conference room at Yukon-Koyukuk School District Office in Fairbanks, AK, and had video links to the school sites of the participants. This alteration was due to the fact that a face-to-face session was not feasible for reasons of isolation; the cost in both time and money to bring participants together did not outweigh the possible difficulties in conducting a videoconference focus group. The focus group was conducted after IRB approval was granted, in November, 2009.

Data Analysis and Anticipated Problems

Surveymonkey.com provided a table of survey responses that I was then able to further analyze. I did not collect any demographic data from the survey participants. When dealing with such a small population, those identifiers may more readily affect anonymity or privacy considerations. I conducted an audio analysis of the focus group.

Teachers were given two weeks to complete the survey; it was something that they could do at their leisure, as long as they had Internet access. The focus group took place after the school day so that teachers were free from supervisory responsibilities and were then able to concentrate on the task at hand.

I anticipated that there may have been a problem breaking through the culture of isolationism, the "egg-crate" structure prevalent in modern educational practices, and getting both teachers and administrators to think about the possibilities of adult learning communities/ communities of practice. Being relatively unfamiliar with most of the sample population, I was not sure how prevalent this culture was.

The only issue I anticipated for the survey is one of connectivity or server issues. To address this potential problem, I provided a significant length of time for survey completion. I had some difficulty gaining enough volunteers for the group. To mediate that issue, I enacted snowball type sampling. Obviously, by having both a self-selecting focus group as well as an optional survey, the answers I received are likely to be polarized. Those who may have been shy or who had not developed a position on the issue at hand were less likely to take part. Also, by only focusing on one district, with its own population, and distinct technological infrastructure; any insights I gained may not be readily generalizeable to the bigger population of perhaps the state of Alaska.

IRB approval was granted for this study as per University and School of Education standards. I successfully competed the CITI training as of 7/15/09.

The finalized research report will be presented publically at the University. Copies of the report will also be made available to Yukon-Koyukuk School District, with the possible option of presenting to the district as well.

Findings and Analysis

The purpose of this inquiry was two-fold; I wanted to get a picture of the perceived technology skills of district teachers, and I also wanted the teachers to have an opportunity to describe their actual situation, their ideas for solving problems, the current methods of their social practices or community as it applies to teaching, and their vision of what technology could do for the district, as well as for their own professional practice.

Conventionally, the survey data would precede the focus group analysis, but I find that the focus group provides a framework and lens through which to view the survey data, situating it in the context of this unique place.

Focus Group

The focus group guiding questions (See Appendix) focused mainly on identifying the strengths and weaknesses of technology use at Yukon-Koyukuk School District. Participants were asked to think of what an ideal situation would look like in terms of teacher collaboration, as well as to identify and share their own ideas and expectations in terms of support from the school district itself.

The participants, classroom teachers whom I will call Harvey, Sherman, Joy and George, focused on five main topics or areas of concern which seemed to arise while unraveling the idea of collaboration: *infrastructure, hardware, software, lesson planning,* and *training/support*.. These topics, in fact, seemed to preclude the idea of collaboration itself. In analyzing the data, these categories arose and provided a better explanation of the technological realities that the teachers face, than do the questions with which I

started. Again, thinking of Lave and Wenger's unproblematic and invisible system, my attempt here is to shed light on the roadblocks to its development.

Technological infrastructure, e.g. network, bandwidth, servers, routers, modems, phone lines, and satellite links seems to be the primary concern of the participants, and as Sherman states, leads to other related issues:

> We need better network service as far as our network here, it's on the fritz all of the time and we need someone to come out who actually knows what they are doing, to take a look at the network and kind of rewire things so that we're not having those [kinds of] problems…

Another participant, Harvey, expresses issues with the infrastructure at his site:

> [I would like] Better phone systems and intercom systems, like between classes because I'm in a separate building, and sometime's there's a message for me on the other side, and I'll have to send a kid running across to get the message, so better on-site infrastructure.

This comment spurred on the following dialogue, which temporarily dominated our discussion and foreshadowed the conversation to come.

> George (to other participants): Do you have a phone in your classroom?
>
> Joy: No, I don't.
>
> Sherman: Yeah, me neither, that would be nice.

The tendency for me, as an outsider, and a professional living and working in a school setting, is to take for granted the simplest things such as having a telephone in the classroom. As Bruce and Hogan (1998) state, "Technology can reinscribe inequitable

power relations" (p. 269). My ideas of what should, or should not be standard technological equipment in the classroom show this idea in action; teachers who are operating with what I might consider the bare minimum in terms of infrastructure are disadvantaged when it comes to keeping up with their peers in a professional sense.

At this point, my planned direction for the focus group changed slightly. I was relatively surprised by the lack of what I might describe as simple technologies, and therefore thinking that any form of complex technology-based collaboration may be so far over the horizon as to be un-seeable to the participants. A lack of infrastructure may also be compounding the issues of teacher isolation.

On the other hand, the participants did express interest in harnessing the existing infrastructure in order to work more closely with each other, as evidenced by the following from Harvey:

> There could be more utilization between site to site with the videoconferencing, more stuff with teachers doing things with other classes at other sites, I mean it's already in the classrooms and it's really easy to dial up. Besides the online classes, [Yukon-Koyukuk has limited offerings including art, and Denaakk'e Language]… there's really no classes doing stuff over videoconference with the other sites.

Teachers seemed to have a shared commitment, or interest in this topic, but the infrastructure is not being harnessed to foster any type of relationship-building activities, or to create a shared sense of practice, all three factors being needed for the development of a community of practice (Lave & Wenger, 1991). The participants also did not seem

outwardly to possess the 'egg-crate' isolationist territoriality described by Johnson and Donaldson (2007).

Hardware, which I consider to be things like computers and peripherals such as digital cameras and LCD projectors, and *software*, which I consider to be computer programs and online tools, were the second area that the participants focused on. Currently, some teachers use 'FirstClass,' an online program that allows chatting, or instant messaging, and 'ClassBright,' another online program used to align lesson plans with state grade level expectations. The following conversation illuminates several key issues with both hardware and software:

> Sherman: (Another teacher) was actually looking up a program where you could sit and look at your laptop and you could see the screens of every one of your students in the class, and actually see what they were looking at, you could actually get on and take over their laptop if you need to, or write stuff to them.

[The program the participants were referencing is a monitorial program called "Remote Desktop."]

> Harvey: For that to work everyone would have to have Macintosh computers, it's really not a program you can do with Windows Vista.
>
> George: Within our district it's not all Mac, it's not all PC.
>
> Harvey: That mish-mash causes some real problems, it even causes simple problems like when you attach files in an email and some people can't open them because you're trying to go from Mac to Windows.

These 'platform' issues were seen as critical by the participants, and are acting as another roadblock, not only to collaboration, but also the supervision of student technology use.

The third area of interest for the participants is the task of *lesson planning*. Due to the remoteness, and also the small size of the participants' schools, they may be the only teacher for a variety of subjects. This translates into many teachers teaching outside of their comfort zone, and with the barest minimum of materials and references. Both Sherman and Harvey expressed interest in using some type of collaborative software to facilitate the sharing of lesson plans and materials, while also alluding to the perceived collaborative atmosphere, as evidenced in the following dialogue:

> Harvey: Blackboard would be a good thing, if it were embedded in the lesson-planning thing, [it] goes back to the lesson planning thing and how it is not being utilized as it could, it's a touchy subject around the district.
>
> Sherman: The online lesson planning program 'ClassBright,' it's supposed to be this-- they expect us to-- there to be a lot of collaboration between the lesson planning, a lot of sharing. I think that there is practically none of that going on.
>
> George: I think that it would help for there to be more collaborations online if, like, the district had a set lesson plan for the text book, like *these* lesson plans would fit with *this* text book and everyone would have that stuff already on 'ClassBright,' and then add in your own stuff, your supplementary stuff.

At this point Joy, who had been relatively quiet for the duration of the focus group added: "When I'm teaching out of my subject area, it would be easier if I could get some lesson plans." This was again surprising to me, as had been the previous revelation about the lack of a telephone in the classroom, and caused me to question my assumptions about what teachers 'normally' have at their disposal when planning student learning activities. Lesson plans could be seen as possibly the most important 'technology' for teaching, and have become so embedded in the teaching process that they are no longer thought of as such (Bruce and Hogan, 1998).

The last area of significance discussed is that of *teacher training and support*. The participants also approached this topic with some trepidation as evidenced by Harvey's tempered reaction:

> I think we need more training on… some of the teachers don't/ aren't very literate with the technology. I grew up with it, but a person, some of the older teachers, didn't/ don't know what they are doing.

To this, Joy added, "I'm one of those older teachers and I have to do it [learn or use a new technology] several times before I get it/ figure it out." It is important to remember that when Joy says this, she is speaking from a context of isolation, and this learning is something she does with very little guidance.

The trepidation could signify the larger district culture, but could also be an example of what Gulati (2008) suggests may be a fear of surveillance, or external control. This may have been compounded by my use of the district's own videoconferencing equipment and space.

Suggestions also arose from the participants pertaining to the technology department and its staffing, which at the time of this inquiry included one director, one full time technology specialist and one technology specialist/registrar. This staffing arrangement was met with the following comment from George; "I would like to see a bigger tech. department, with more people. We are understaffed in the tech. department." Since this focus group, the tech specialist/registrar has resigned and the district has decided to leave the position vacant. This may be more indicative of the current economic situation, rather than a counterintuitive move in relationship to district support for teachers.

When thinking about creating the 'ideal situation,' the focus group members were quick to point out ways of bettering the current situation, rather than suggesting complete paradigmatic changes. To me this shows a commitment to the district, and to the teaching community itself. This should be taken as a positive indicator of a willingness to move forward, and I hope it as taken as such.

Survey Data

The survey data are consistent with what I expected; they show a wide range of individual skill levels, and also provide a sense of where strengths and areas of weakness are. Table 1 shows the key dimensions from the survey, with responses shown in terms of percentage of the responses. Participants were given 4 options to describe their skills and behaviors; not at all, minimally, am able but do not, and confidently. Those responses

were scaled 0-3, respectively. The survey had 28 respondents from a total sample size of 30, for a response rate of 93%.

Table 1 Survey dimensions and constructs with skill levels

Question Topic	% Not at all	% Minimally	% Am able, but do not	% Confidently
Productivity and professional use (Part One)				
Q1 Using email and other forms of electronic communication	**0**	**25**	**11**	**64**
Q2 Examining new technologies for professional development	**4**	**46**	**0**	**50**
Q3 Evaluating new technologies for personal use	7	37	0	56
Q4 Evaluating new technologies for work related needs	4	50	7	39
Q5 Participating in technology-based collaboration for professional growth	**18**	**43**	**14**	**25**
Q6 Participating in tech.-based collaboration to support student learning	**32**	**39**	**18**	**11**

Table 1 continued...

Teaching, learning, and the curriculum (Part Two)				
Q7 Selecting technology resources that align with state and district standards	4	46	0	50
Q8 Providing students with access to technology resources	4	40	4	52
Q9 Teaching students strategies to assess online information	**8**	**60**	**4**	**28**
Q10 Encouraging students to share their technology-related expertise	**0**	**44**	**4**	**52**

0-3 scale: 0 = Not at all, 1 = Minimally, 2 = Am able, but do not, 3 = Confidently

Overall, teachers rated themselves the highest for a more 'common' skill such as email than they did for a behavior-oriented item such as participating in technology-based collaboration to enhance student learning, however, six of the ten skills and behaviors show at least half of the participants rating themselves "confidently." This is consistent with the responses from the focus group as well, where participants all stated that they frequently used email to collaborate, and for other professional and personal uses. This may also speak to the embedded nature (Bruce and Hogan, 1998) of email, and/or email as a somewhat unproblematic system (Lave and Wenger, 1991).

Questions five and six pertain to teachers using online collaboration for both professional growth and to support student learning. The teachers reporting either "not at all," or "minimally" for those two constructs were 61%, and 70% respectively. Similar areas for possible concern can be found in questions two and three, as well as question nine.

Questions two and three deal with teachers' examinations of new and emerging technologies for personal (Q2), and professional (Q3) use. The teachers reporting either "not at all," or "minimally" for these constructs were 50% and 44%, respectively. Question nine is in regards to teaching students to evaluate the materials and interactions they encounter online. Eighty-six percent of teacher are either not doing this, or doing it "minimally."

The survey can also be split into two parts as it was in the ISTE original, and as shown above in Table 1. The first group of questions can be seen as elucidating teacher behaviors (skills) and attitudes regarding the dimensions of online professional development or learning behaviors, while the second group of questions can be viewed as elucidating teacher attitudes and behaviors with regards to the dimension of technology use in their classrooms, as well as whether or not they are comfortable transferring control to others. By this, I mean whether teachers were willing to take advantage of their students' possible knowledge and to harness that knowledge for use both in class and the community.

By first contrasting, then combining the two sets of questions, I was able to get a feel for the overall technological skill-set of the district teachers. The teachers seem to

have scored themselves slightly higher in the second dimension than the first, as evidenced by the percentage of respondents who marked "Confidently." This suggests that teachers are more knowledgeable and willing to think about technology in the context of their classroom and their student's development than they are to think of it in the context of their own development. This could be due to several factors, including the technological infrastructure at their specific site, their district mandated need to access technology for instructional purposes, or other reasons.

In terms of data regarding current social practices, the low rates of reported collaboration for questions 5 and 6, which were 25% and 11% (those who marked "Confidently," respectively, suggest that technology-based collaboration is not happening with much frequency. This data is compounded with the focus group finding, wherein participants address the need to have more efficacious collaboration. Without this relational piece, Wenger's (2006) three characteristics cannot be present, and a community of practice is not likely to develop.

Discussion

Lave and Wenger (1991), speak about the importance of the fluidity and seamlessness of mediating technologies; unfortunately, this district is not there yet, and I see this as the largest stumbling block on the way to establishing meaningful communities of practice. Teachers who do not even have telephones in their classrooms, batteries for their digital cameras, and the right equipment to share files between platforms are not in a mental place to devote time and energy to creating bourgeoning, vibrant online communities.

In terms of existing collaborative technologies, procedures, or software, whether the district has anything in place ceases to matter if teachers are either unaware of its existence or untrained in its use, as appears to be part of the problem here. It also became evident to me, through the demeanor of the focus group participants that the district teachers do not feel they have the freedom to be critical of district policies regarding technology use, development, or structure.

The focus group responses were not consistent with what I had expected in thinking about the questions from the perspective of my own experience. At first, I encountered quite a bit of trepidation on the part of the participants to express any idea that may have been perceived as critical. Also, for the first half of the focus group, a district office employee was working in the same room as I, within video-range of the participants, although they could not hear her. Her comments, although not directed to me, or the participants, were very disparaging and negative. Her tendency was to

downplay the concerns raised by the participants, and also to dismiss the suggestions postulated by the group. This type of attitude plays against positive change.

The survey data was consistent with what I had expected, and should be seen not as an overly-critical and evaluative piece of information, rather it should be seen as something of a roadmap for where improvements in training could be provided.

Recommendations

In light of this study, I feel compelled to make several recommendations to Yukon-Koyukuk School District, starting with the development of a systematic and strategic plan dealing with the key dimensions outlined by the focus group (infrastructure, hardware, software, etc.), and moving toward the three characteristics outlined by Wenger for cultivating successful communities of practice (2006), as a shared commitment to an idea or goal (collaboration in this specific case), building relationships through shared activities, and then building a shared practice. By creating an organizational plan as has been suggested by Berge et al. (2002), as well as Tabata and Johnsrud (2008) could also work toward changing perceptions of what collaboration looks like, creating a new framework as implied by Lock (2006), in addition to Hur and Brush (2009). This organizational plan could include the following elements, which are derived from the focus group conversation, as well as the survey results:

1. The creation and distribution of an inventory of all hardware at each site, as well as a list of hardware at district office, available to each teacher. This inventory could be seen as a starting point for identifying areas for upgrades,

additions, and increasing technological equity. This may also act as a first step in deciding whether or not to move towards a district-wide platform (either Mac or PC) to ease teacher collaboration and student computer-use supervision, as suggested during the focus group.

2. The performance of an audit or study of the existing district infrastructure, including network, and video-conferencing capabilities to discover strengths, and also to find weaknesses within the system. The information gained could then be used to inform Recommendation 4.
3. The creation and implementation of a training program including skills for district email, FirstClass, and ClassBright for collaboration, lesson plan sharing, as well as district-wide pacing for core courses. Attention should also be given to the evaluation of new and emerging technologies so that teachers can feel a sense of power or agency when confronted with the assessment, adoption or integration of leading-edge technologies.
4. The development of existing technologies such as videoconferencing for use between sites for collaboration, and also as a teaching tool to give the best quality instruction to students. This could include expanding the videoconference offerings to other subjects such as math, or the humanities.
5. The utilization of teacher knowledge to create and foster a teacher-driven community of practice, aligning district newcomers with technologically proficient existing staff mentors. This could include providing an open period

for site-techs to perform their duties, and/or engage in asynchronous training which they could then pass on to the staff and students at their specific site.

6. The addition of at least one full-time technology and education specialist to oversee and help develop the preceding suggestions, as well as serve as a liaison between teachers and district office technology staff, to increase understanding, to facilitate collaboration, and to offer training appropriate to those at the individual school-sites.

Questions For Further Study

The focus group results suggest that teachers would value an increase in collaboration, while the survey results suggest that teachers need more training before that can effectively take place. This suggests a relationship between hardware, software, training, collaboration, communities of practice, and district office. More research is needed to fully develop the framework of what I see as a complex and interrelated system where one component cannot be changed without the change of the others. This suggests, as both Bromley (1997) and Bruce (2002) postulate, that technology is a highly situated and socially constructed practice. For my purposes in studying rural collaboration, this is an integral piece that deserves further understanding and discussion.

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Appendix

Appendix A

Focus Group Protocol

5 Minutes	Introduction	1. Introduction, overview, consent.
5 Minutes	Strengths	2. What are the strengths of technology use between teachers at YKSD? What works really well?
5 Minutes	Areas for Improvement	3. What are the areas for improvement of technology use between teachers for communication or collaboration? What isn't working?
5 Minutes	Your Use	4. How do you use internet-based technology for communication and or collaboration? How do you use it in your personal life?
10 Minutes	Ideal World	5. If you could paint a picture of an ideal world at YKSD relative to technology and internet-based communication and collaboration, what would it look like? What type of supports would be in place?
10 Minutes	Expectations	6. What type of expectations do you or did you have about the type of collaborative support you want and need from the district?

5 Minutes	What You Need	7. What do you need from YKSD in terms of collaborative support to assist you in meeting your professional goals?
5 Minutes	Prioritizing	8. Prioritize answers within each category.
5 Minutes	Final Thoughts	9. Wrap up with any comments the participants would like to share.
55 Minutes	Total	

Appendix B Survey Instrument

Performance Standards for Inservice Teachers (ISTE)

Please complete the following survey by responding to each question. Each question is phrased with the beginning stem of **"In your experience as a teacher…"** Each question should be answered with **"Not at all," "Minimally," "Confidently,"** or **"Am able, but do not."**

Information gained from the results of this survey will be used to partially fulfill the master thesis requirement at the University of Alaska Fairbanks, and will be anonymized before being disseminated to your district, in order to inform decision-makers involved in planning for future professional development activities. Please note that you do have the option to let other survey takers see your results. ***This is optional***, and will not have any effect on your results or the results of the study.

Productivity and Professional Practice

1. In your experience as a teacher, do you use email and/or other forms of electronic communication to facilitate communication with other teachers?
2. …review new/ emerging technologies with respect to their potential capabilities and limitations?
3. …examine new/ emerging technologies with respect to the potential they lend to life-long learning, and/or your own professional development?

4. …evaluate the potential of new/emerging technologies to meet your personal needs?
5. …evaluate the potential of new/emerging technologies for addressing professional or work-related needs?
6. …participate in technology-based collaboration such as on-line collaborative curriculum projects, forums, newsgroups, list-servs for your own professional growth?
7. …participate in technology based collaboration such as on-line collaborative curriculum projects, forums, newsgroups, or list-servs to stay abreast of new and emerging technologies supportive of learning?

Teaching, Learning, & the Curriculum

8. In your experience as a teacher, do you select technology resources such as the Web, calculators, data collection probes, videos, educational software that align with either district or state standards?
9. …provide opportunities for students to access school and community resources that provide technological and/or discipline specific expertise?
10. …use tool such as rubrics, checklists, journals for self- and peer- assessment in critiquing student work?
11. …teach students strategies to assess the quality of information they gather via the web and/or other technologies?
12. …encourage students with technology interests to share their expertise with their peers?

13. …encourage students with technology interests to share their expertise with teachers and other adults in the learning community?